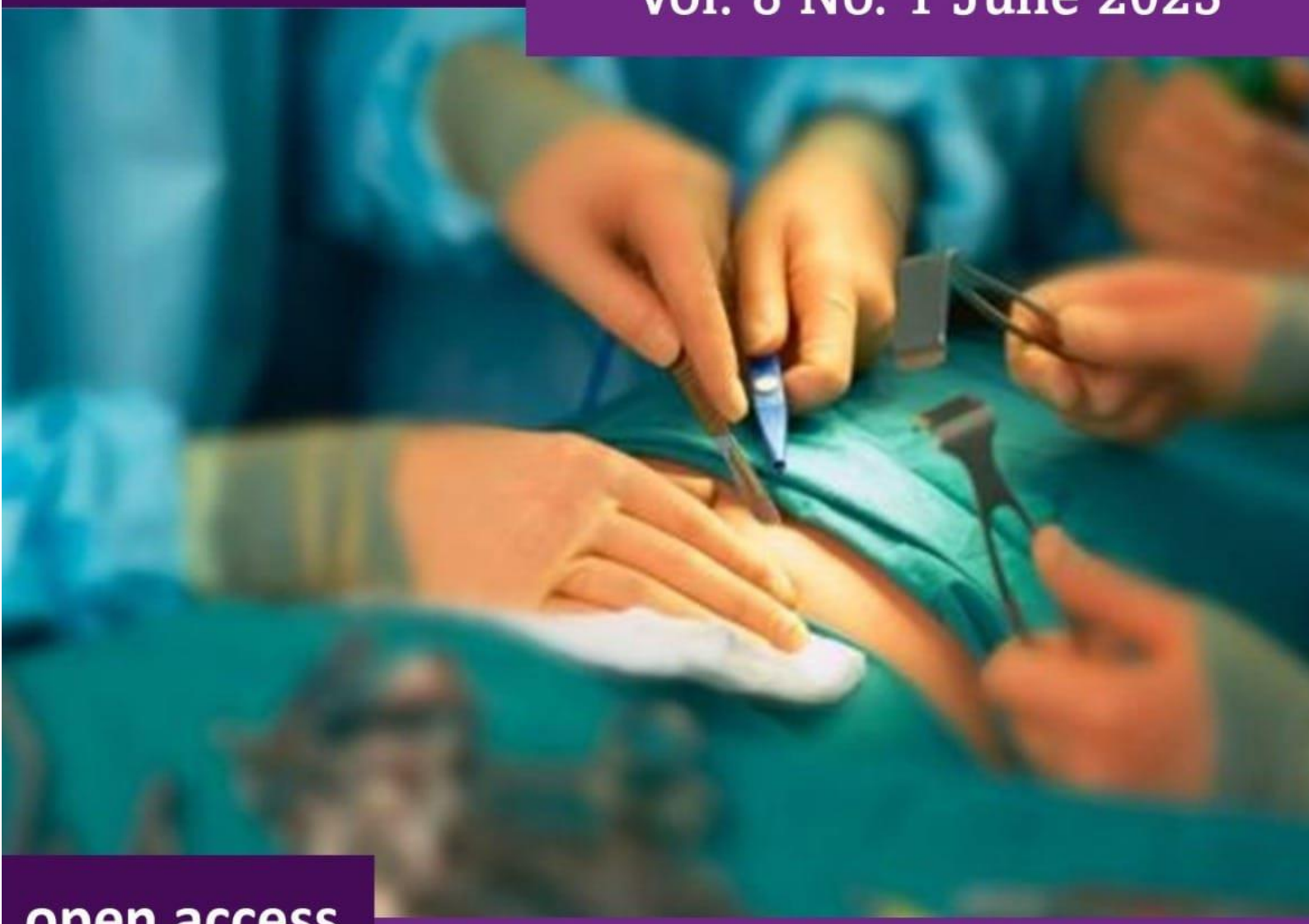
e-ISSN 2774-6062 | p-ISSN 2301-7937

Vol. 8 No. 1 June 2023



open access

Jurnal Rekonstruksi dan Estetik

http://e-journal.unair.ac.id/JRE

Plastic Reconstructive and Aesthetic Surgery Department
Faculty of Medicine, Universitas Airlangga - Dr. Soetomo General Academic Hospital
Indonesia

e-ISSN:2774-6062; p-ISSN: 2301-7937

JURNAL REKONSTRUKSI DAN ESTETIK

ADDRESSS

Department of Plastic Reconstructive and Aesthetic Surgery
Faculty of Medicine, Universitas Airlangga - Dr. Soetomo General Academic Hospital
Jl. Mayjend Prof. Dr. Moestopo, No. 6-8, Surabaya, 60285. Indonesia

CONTACT INFO

Phone: (031) 5020091 ext 1314
Email: jre@journal.unair.ac.id

VOL.8 NO.1, JUNE 2023

Jurnal Rekonstruksi dan Estetik is a scientific peer-reviewed medical journal which is relevant to doctor and other health-related professions published by the Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. Jurnal Rekonstruksi dan Estetik is published twice a year, every **June and December.** Jurnal Rekonstruksi dan Estetik focuses in publishing **case report, review article,systematic review, literature review, meta-analysis and original article** on the latest medical sciences.

FOCUS AND SCOPE

burn and wound, hand surgery, microsurgery, oncoplastic, craniofacial and external genitalia reconstruction, and aesthetics.

TABLE OF CONTENT

JURNAL
REKONSTRUKSI DAN ESTETIK

A CASE REPORT: THE STAGED RETRO AURICULAR FLAPS FOR AURICLE RECONSTRUCTION AFTER TRAUMATIC AMPUTATIONS

Doni Setiawan[a], Alexandria Stephanie[b]*, Yugos Juli Fitra[c]

[a]Plastic Reconstructive and Aesthetic Surgeon, Dr. Soedarso General Hospital, Pontianak, Indonesia
[b]Plastic Reconstructive and Aesthetic Surgeon, Gunung Jati General Hospital, Cirebon, Indonesia

ARTICLE INFO

Keywords: Auricle, amputation, reconstructions, retro auricular flap, traffic accident

***Corresponding author*:**
Alexandria Stephanie
Email address:
alexaniesu@gmail.com

***History*:**
Received: April 12, 2023
Revised: May 17, 2023
Accepted: May 27, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2301-7937
DOI: 10.20473/jre.v8i1.45402
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Setiawan D, Stephanie A & Fitria YJ. A CASE REPORT: THE STAGED RETROAURICULAR FLAPS FOR AURICLE RECONSTRUCTION AFTER TRAUMATIC AMPUTATIONS. Jurnal Rekonstruksi dan Estetik.2023; 8(1): 1-5.

ABSTRACT

Introduction: A complete amputation or other severe auricular injury is rare. The amputated ear also presents a significant problem for the plastic surgeon.
Case Illustration: A 29-year-old man had his left ear amputated due to trauma presented. He cut off his ear to get rid of the whisper because he has a history of psychiatric illnesses and complaints about hearing them. The remaining portion of the cartilage that was still linked to the ear attachment area was sutured to the preserved cartilage. The defect is covered using a stage pedicle flap. A skin transplant was used to close the donor flap's retro-auricular defect, which was its secondary defect.
Discussion: A random-pattern flap with an abundant vascular supply is the staged retro-auricular flap (SRF). This flap's main disadvantage is the two-stage process required to complete it. Excellent cosmetic outcomes can be achieved by matching skin color and texture well in the postauricular sulcus, mastoid area, and posterior ear.
Conclusion: SRF is an efficient ear reconstruction technique that offers relatively little operational morbidity and can restore the ear's size and shape with good to exceptional functional and cosmetic results when used on appropriately chosen helical ear abnormalities.

Highlights:

1. Instances of severe ear injuries are uncommon.
2. The paragraph explores the efficacy of the staged retro-auricular flap (SRF) as a proficient approach to ear reconstruction.
3. SRF demonstrates the ability to successfully reinstate the ear's dimensions, contour, and functionality, yielding highly satisfactory functional and aesthetic outcomes.

INTRODUCTION

Severe auricular trauma, especially complete amputations, is a rare injury[1,2]. In addition, the severed ear is a major challenge for plastic surgeons[3]. Ear repair is difficult because of the intricate structure of the ear and the scarcity of local tissue. The unique and intricate anatomical nature of

the auricle, with its fine skin covering, thin and elastic cartilage, and constrained blood supply caused by the tiny size of the capillaries responsible for its perfusion, is mostly to blame for the difficulties of reconstitution[2,3].

Auricular trauma is divided into four categories: superficial trauma (first degree), tear with nutrient skin pedicle (second degree), partial and total avulsion with existing segment (third degree), and partial and total avulsion without existing segment (fourth degree)[1].

The most popular ear reconstruction techniques at the moment include microvascular repair, pocket principle, reconstruction using local flaps, the baudet method, and reattachment as a composite graft[4,5]. Simple reattachment is only indicated when the injury results in the preservation of a skin pedicle[4]. There are several variations on the use of local skin flaps in auricular reattachment and reconstruction, including the use of flaps from the preauricular, retro-auricular, mastoid, and cervical areas, as well as skin from the medial and lateral surfaces of the ear[4].

Since 1898, several reattachment techniques have been developed, but only a select few have produced acceptable cosmetic results[2]. The purpose of this study was to present a successful example of stepwise retro-auricular flap restoration of the auricle.

CASE ILLUSTRATION

A 29 years-old man presented with traumatic amputation of his left ear. He has a history of psychiatric disorders with complaints of hearing whispers, so he cut off his ear to remove the whisper. During the examination, it was discovered that his left ear's pinna had been removed transversely, leaving the cartilage exposed and the auricle with only a 2 cm skin attachment behind the lobules (Figure 1). The results of other physical exams were normal.

After informed consent was obtained, the patient was admitted and taken to the operating room. First, the amputated ear segment was cleaned with saline and a diluted povidone-iodine solution. Second, the skin on the amputated segment was separated from the cartilage with the perichondrium preserved and directly sutured to the part of the remaining cartilage. Next, the postauricular mastoid skin was elevated to cover the defect on the cartilage as a stage retro auricular flap. Then the secondary defect of the donor flap (retro auricular defect) was closed using a skin graft.

Figure 1. Pre-operation

Figure 2. Cartilage gra

Figure 3. Post operation

DISCUSSION

The decision to do surgery to manage a whole auricular amputation depends on several variables, including the condition of the segment and surrounding tissue, the ischemia period, the size and location of the avulsed part, the etiology of the injury, and the patient's expectations[2].

Larger-than-one-third auricular defects are difficult to reconstruct, and it takes a lot of skill. Due to the complicated and delicate architecture of the external ear structure, which is challenging to recreate surgically, larger ear abnormalities present unique and severe problems to plastic surgeons[6]. Despite difficulties in reproducing the delicate auricular anatomy, the surgeon could produce satisfactory results with thorough information on landmarks, size, and position. By carefully matching the skin color and texture in specific areas such as the postauricular sulcus, mastoid area, and posterior ear, excellent cosmetic outcomes can be achieved.

The staged retro auricular flap (SRF) is a random-pattern flap with a rich vascular supply based on branches of the posterior auricular, superficial temporal, and occipital arteries. (Figure 4)[7]. For full-thickness lesions at the helical rim and antihelix, a staged retro auricular flap is a great option. The donor site consists of the posterior ear, postauricular sulcus, and mastoid area[6].

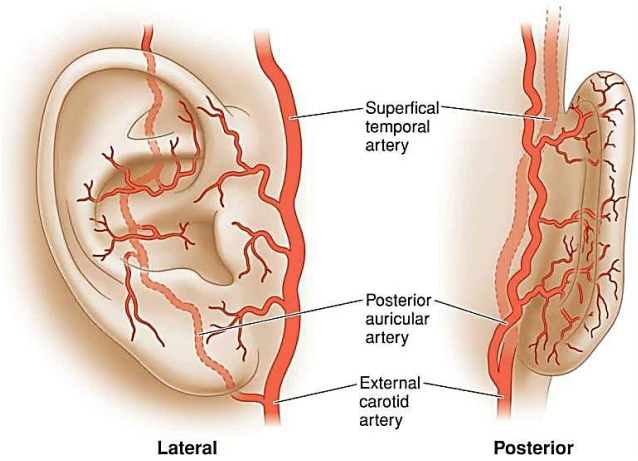


Figure 4. Arterial supply of the ear[8]

The SRF technique is associated with relatively low morbidity, meaning that the procedure is less likely to cause significant complications or adverse effects. The SRF technique is specifically suitable for helical ear abnormalities. It may not be the most appropriate or effective approach for other types of auricular injuries or defects. The combined retro auricular flap repair in one stage improves cosmetic results and lowers the risk of additional procedures[9]. The success of the SRF technique and the achieved cosmetic outcomes can vary depending on individual patient characteristics, including the quality of the remaining cartilage, skin condition, and overall healing ability. In cases involving psychiatric illnesses or psychological factors contributing to the injury, the SRF technique should be complemented with appropriate psychological support and treatment to address the underlying issues.

This flap has the benefits of a concealed donor scar, donor tissue resemblance, and rich vascularity[6]. The main disadvantage of this flap is that it requires two steps to complete. This can prolong the overall treatment duration and may involve additional surgical procedures and recovery

time. For outstanding cosmetic outcomes, the mastoid area, postauricular sulcus, and posterior ear offer a good skin color or texture match[7].

The staged pedicle flap may also be employed in this situation for medium to large (1 to 6 cm) lesions involving the anterior region of the helix-antihelix with or without loss of perichondrium or minor quantities of Cartilage[10]. In flaps pedicled by the postauricular vessels or the superficial temporal vessels, the blood circulation was safe and the look was pleasing to the eye. This flap was employed in the auricular or periauricular region. However, the blood circulation of the flaps pedicled by superficial temporal vessels, whether they were subcutaneous pedicle flaps or free flaps, was unstable when the defect was farther from the auricle[11].

CONCLUSION

SRF is an effective ear reconstruction method that provides relatively little operative morbidity, a good to excellent functional and cosmetic outcome may be obtained by restoring the ear size and shape when performed on properly selected helical ear defects.

ACKNOWLEDGMENTS

The authors would like to thank Plastic Reconstructive and Aesthetic Surgeon, Dr. Soedarso General Hospital, Pontianak, Indonesia, and Plastic Reconstructive and Aesthetic Surgeon, Gunung Jati General Hospital, Cirebon, Indonesia.

CONFLICT OF INTEREST

There is no potential conflicts of interest were disclosed by the authors about the research, writing, or publication of this paper.

FUNDING DISCLOSURE

The authors received no financial support for the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTION

DS and YJF were the design of this study, proposed the main idea, and manuscript preparation and drafted. AS contributed to Conceptualization, methodology, analysis, supervision, and final manuscript approval. DS was writing and revising the manuscript. YJF was Project Administration.

REFERENCES

1. Magritz R, Siegert R. Reconstruction of The Avulsed Auricle after Trauma. *Otolaryngol Clin North Am* 2013; 46: 841–855.
2. Lyu Y, Ma L, Ke C, et al. A Two-Stage Inversion Technique for Total Auricular Reconstruction: Case Report And Literature Review. *BMC Surg* 2018; 18: 74.
3. Kyrmizakis DE, Karatzanis AD, Bourolias CA, et al. Nonmicrosurgical Reconstruction of The Auricle after Traumatic Amputation Due to Human Bite. *Head Face Med* 2006; 2: 45.
4. Gailey AD, Farquhar D, Clark JM, et al. Auricular Avulsion Injuries and Reattachment Techniques: A Systematic Review. *Laryngoscope Investig Otolaryngol* 2020; 5: 381–389.
5. Brockhoff HC 2nd, Zide M. Delayed Ear Reconstruction: Case Report of Reconstruction of an Avulsed Ear 2 Days After Injury. *J oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg* 2014; 72: 1432.e1–4.
6. Ebrahimi A, Kazemi A, Rasouli HR, et al. Reconstructive Surgery of Auricular Defects: an Overview. *Trauma Mon* 2015; 20: e28202.
7. Cerci FB. Staged Retroauricular Flap for

Helical Reconstruction after Mohs Micrographic Surgery. *Anais brasileiros de dermatologia* 2016; 91: 144–147.
8. Ear. *Fastest Plastic Surgery & Dermatology Insight Engine*, https://plasticsurgerykey.com/ear/ (2016).
9. Poissonnet G, Poissonnet VJ, Dassonville O, et al. Partial Central Anterior Reconstruction of The Auricle with One-Stage Combined Retroauricular Flaps. *Plast Reconstr Surg*. Epub ahead of print May 2023. DOI: 10.1097/PRS.0000000000010611.
10. Johnson TM, Fader DJ. The Staged Retroauricular to Auricular Direct Pedicle (Interpolation) Flap for Helical Ear Reconstruction. *J Am Acad Dermatol* 1997; 37: 975–978.
11. Yotsuyanagi T, Watanabe Y, Yamashita K, et al. Retroauricular Flap: Its Clinical Application and Safety. *Br J Plast Surg* 2001; 54: 12–19.

JURNAL
REKONSTRUKSI DAN ESTETIK

A CASE REPORT: ANTIRETROVIRAL-ASSOCIATED BILATERAL GYNECOMASTIA

Erdo Puncak Sidarta[a]*, Syeben Hezer Epatah Hietingwati[b]

[a]Department of Surgery, Prof. Dr. W.Z Johannes General Hospital, Kupang, East Nusa Tenggara
[b]Department of Anatomic Pathology, Prof. Dr. W.Z. Johannes General Hospital Kupang, East Nusa Tenggara

ARTICLE INFO

Keywords: Antiretroviral, gynecomastia, HIV, human immunodeficiency

***Corresponding author*:**
Erdo Puncak Sidarta
Email address:
erdo.ps@gmail.com

***History*:**
Received: January 5, 2023
Revised: May 19, 2023
Accepted: May 25, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2301-7937
DOI: 10.20473/jre.v8i1.37277

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Sudarta EP & Heitingwati SHE. A CASE REPORT: ANTIRETROVIRAL- ASSOCIATED BILATERAL GYNECOMASTIA. Jurnal Rekonstruksi dan Estetik.2023; 8(1): 6-13.

ABSTRACT

Introduction: Human Immunodeficiency Virus (HIV) patients can now access antiretroviral drugs even in resource-limited area. The majority of patients receive the fixed daily dose of an efavirenz-based antiviral (ARV) as advised by the World Health Organization (WHO), despite the fact that gynecomastia is a recognized side effect of evafirenz.

Case Ilustration: We report a 31 year-old male with antiretroviral-associated gynecomastia that underwent the bilateral excision without liposuction procedure with satisfying result.

Discussion: Surgeon in limited-resource area faces limited resources to perform some specific procedure. Meanwhile, limited resources also poses patients avoidable adverse events in otherwise clinical setting. The antiretroviral-associated gynecomastia is unavoidable because limited regimen choice. Surgeon needs also to adjust the surgical option to achieve satisfying result without instrument complexities.

Conclusion: We reported satisfying surgical outcome in antiretroviral-associated bilateral gynecomastia patient with limited clinical setting.

Highlights:

1. Gynecomastia is a known potential side effect of efavirenz, which may manifest in HIV patients.
2. Healthcare providers should be vigilant and address the potential adverse effects of medications prescribed to individuals with HIV, including gynecomastia.
3. Surgeons in resource-limited areas show flexibility and can achieve satisfactory results in procedures despite limited resources and surgical options.

INTRODUCTION

Gynecomastia is increased amount of breast tissue and glands in males that can appear after birth, in adolescence, or as an adult[1]. It is characterized by breast hypertrophy and can occasionally occur

unilaterally[13,14,15]. The breast tissue expands due to an increase in the volume of ductal tissue, fat, or both[14,16]. Diagnosis can be determined by patient's history and physical examination[17]. Physiologically, 25% of gynecomastia is considered benign and has self-limiting characteristic[2,3].

Before puberty and after birth, bilateral gynecomastia is a common occurrence and is associated to drug- or narcotic-induced mammary gland expansion[4]. Gynecomastia is also associated with the hormonal imbalance such as over expression of estrogen and suppression or deficiency of androgen due to metabolic disorder[2]. Some drugs that has been known inducing gynecomastia such as spironolactone, cimetidine, ketoconazole, estrogen, 5-a reductase inhibitors, risperidone, verapamile, nifedipine, and antiretroviral drugs[5,6].

Even though gynecomastia has been identified as an adverse event to long-term use (2 years or more) of ARV, especially efavirenz, the majority of patients continue to receive a fixed daily dose of the antiretroviral (ARV) efavirenz-based WHO recommendations[7-9].

Gynecomastia management requires an individualized strategy, particularly when treating the patient's complaint, the condition's origin, and the patients' socioeconomic circumstances. According to the degree of gynecomastia, a variety of procedures are available and can be used. The most effective choice is minimally invasive surgery, which has been associated with fewer issues, a faster recovery, and better aesthetic outcomes[18,19]. Examples of minimally invasive surgery include endoscopic approaches and liposuction-assisted minimal incision surgeries. Gynecomastia surgery difficulties can be divided into early and late problems. Early issues can include hemostasis, seroma, infection, and bleeding, to name a few. Numbness, asymmetry, nipple necrosis, residual breast tissue, hypertrophic scar/keloid, and uneven shapes are examples of late issues[17,20]. These factors are significant while choosing the patient's best course of treatment. One way for treating gynecomastia is surgery since it produces good aesthetic results, relieves patient concerns like pain, and has good complication control[10]. We report a 31 year-old male with antiretroviral-associated gynecomastia who underwent bilateral gynecomastia excision in the resource-limited medical center.

CASE ILLUSTRATION

A 31 year-old male complaints of breast enlargement that is accompanied with moderate pain in office visit. The patient was diagnosed with HIV 4 years prior and already treated with ARV (tenofovir, lamivudine, efavirenz) ever since.

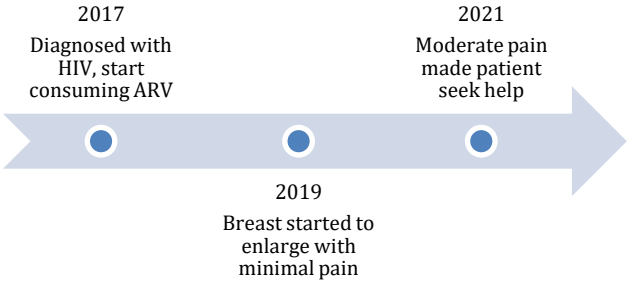


Figure 1. Patient history

The enlargement of the breast started 2 years after ARV administration with worsening pain. During physical examination we found round, and soft mass in both breast with moderate pain on palpation (**Error! Reference source not found.**).

Figure 1. Clinical presentation of the gynecomastia during the first visit.

Additionally, we examined the thyroid glands and both testicles. Hormonal and radiology examination were not performed based on physical examination. We diagnosed this patient with bilateral gynecomastia Simon grade 2a and HIV-infection on ARV.

Simon grade 2a gynecomastia needs gland excision and liposuction in surrounding tissue. Periareolar incision was performed, and excision of the gynecomastia tissue was done with blunt dissection technic. We acquired 13 x 8 x 2 cm tissue from the right breast, and 13 x 9 x 2 cm tissue from the left breast (Figure 2). Both mass were sent to histopathologic examination. Due to limited resources, we did not perform liposuction. Uneven fat distribution was visible but there were no excess skin is needed to excise.

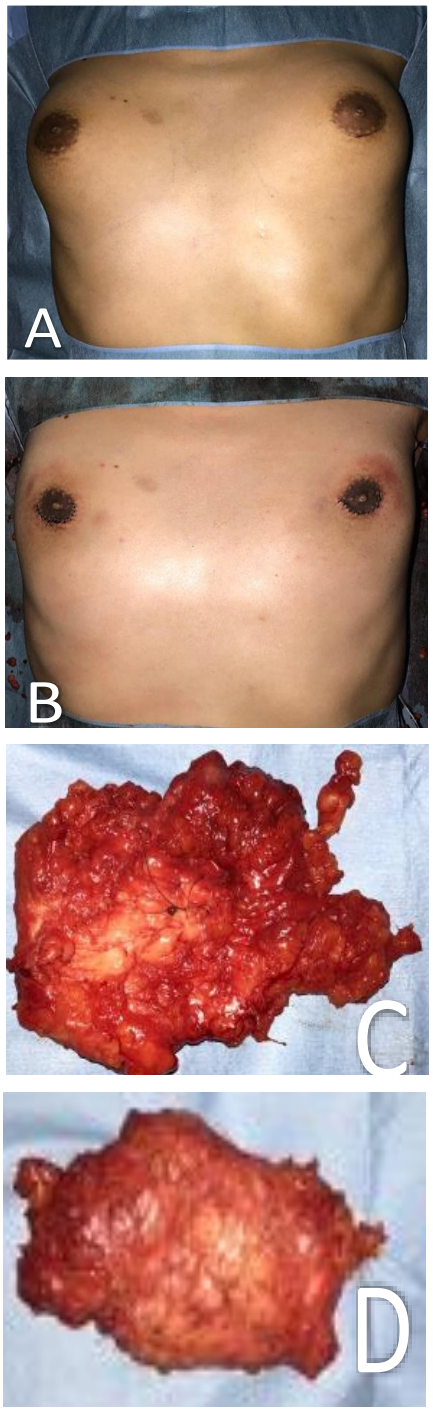


Figure 2. Clinical pictures of durante surgery. (A) pre-surgery, (B) post-surgery, (C and D) glands removed from both side.

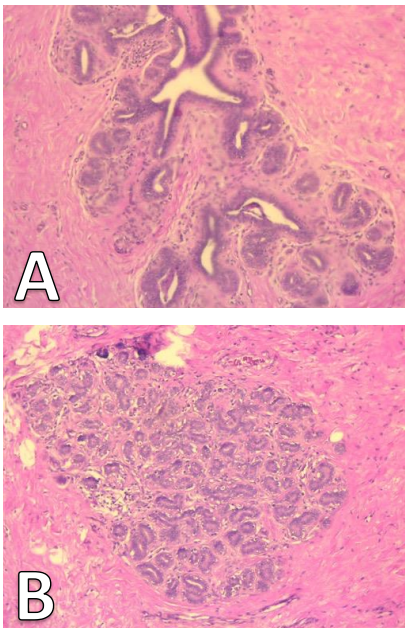


Figure 3. Histologic finding of mammry glands, left (A) and right (B) both showed fibrous connective tissue containing acinar and ductal cells with cuboid epithelial and myoepithelial layer, others showed mature fat tissue, with no sign of malignancy.

We used two vacuum drains, and elastic bandage around the chest. The patient was the sent to the ward for observation. Surgical wound were closed with paraffin gauze and sterile bandage.

Figure 5. Uneven fat distribution after the surgery

Patients was discharged at day 4 after the surgery and planned for outpatient visit to remove the sutures and follow-up care.

DISCUSSION

We did not do radiologic or hormonal tests after the physical examination to diagnose the gynecomastia because the patient was receiving efavirenz-containing antiretroviral medication at the time of the history and physical. Additionally, the fat and glandular tissue could be differentiated clearly, which was sufficient to make the diagnosis of gynecomastia. In fact, we continue to histopathologically examine the breast tissue that has been removed. Gynecomastia was confirmed by the pathological report, which also revealed mature fat tissue free of malignancy and fibrous connective tissue comprising acinar and ductal cells with cuboid epithelium and myoepithelial layer.

The Simon classification of gynecomastia placed this patient at grade 2a, which denotes moderate breast tissue enlargement without ptosis[11]. The surgery's objectives are to remove the hypertrophic fibrotic glandular tissue, reduce pain, and restore the appearance of the male breast. In order to treat this grade of gynecomastia, liposuction and breast tissue removal are recommended[12].

Surgeons in limited-resource area will always face challenges like this patient. When surgical approach is the only preferable method and the adverse effect of efavirenz is unavoidable due to limited choice of anti-retroviral regimen, adjusting the surgical technique due to limited surgical instruments is supposed to be done. It doesn't mean the outcome of the surgery will be less superior, but less instrument complexity also minimize the adverse event yet still aiming the best result.

Direct surgical excision is the preferred course of therapy for the patient because they experience pain and have a moderate amount of breast tissue expansion; nevertheless, due to our limited resources, we were unable to

use the liposuction/combined approach. Following the advice of several earlier studies, we used a peri-areola infero-lateral side incision to hide the scar and make it easier for the surgeon to locate and remove the tissue.[11]

Two months after the surgery during examination post surgery our patient showed an uneven fat distribution, the outcome might be better if combined technique was done (Figure 6). Nevertheless the patient satisfied with the result. There were no other complaints from the patients even after one year of the surgery and it regains the patient's confident back (Figure 7).

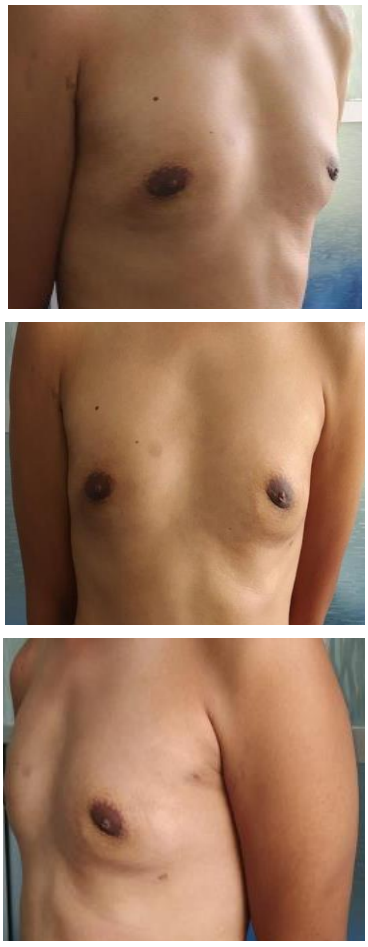


Figure 6. Clinical result in two months after the surgery

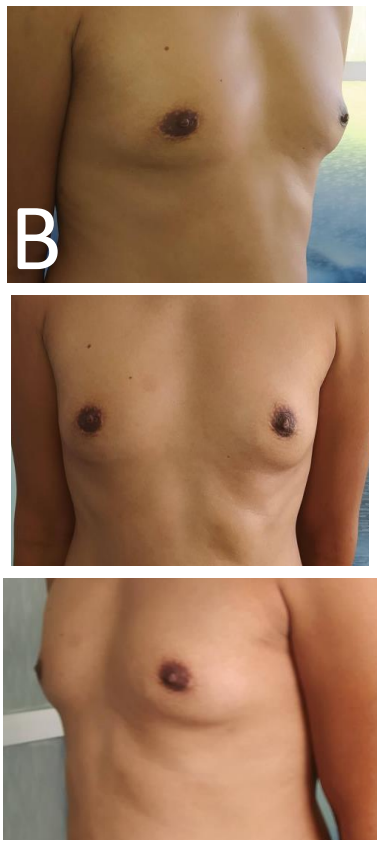


Figure 7. Clinical result in 1 year after the surgery

Patients are discouraged from getting medical help because they don't realize gynecomastia is curable. The growth will have grown to a magnitude where surgical intervention is the only preferable course of action for surgeons when patients eventually seek care due to pain. Since the combined approach cannot be used, the patient should be made aware of potential surgical outcomes, such as unequal fat distribution, in order to make their expectations as reasonable as possible.

This case reported a specific case of antiretroviral-associated gynecomastia in a resource-limited area adds to the existing knowledge and understanding of this condition. The highlighting the availability of antiretroviral drugs in resource-limited areas for HIV patients shows progress in healthcare accessibility.

This case demonstrating a successful surgical outcome in a limited clinical setting provides valuable insights for surgeons facing resource constraints.

The duration of follow-up and long-term outcomes of the surgical procedure is not mentioned, making it difficult to assess the sustainability of the results. The specific resources and equipment limitations faced by the surgeon are not detailed, which could have provided further context and understanding of the challenges encountered. The study does not provide a comparison to alternative treatment options or surgical techniques, which could have provided a more comprehensive analysis of the approach used.

For the future, It is important to educate HIV patients about the potential side effects of antiretroviral drugs, including gynecomastia. Patients should be informed about the possibility of this adverse effect and its management options. Healthcare providers should closely monitor patients receiving efavirenz-based antiviral treatment for the development of gynecomastia. Early detection can help in timely intervention and appropriate management. In a limited-resource setting where alternative treatment options may be limited, healthcare providers should carefully weigh the benefits and risks of different antiretroviral regimens. If gynecomastia is a significant concern, considering alternative drugs or drug combinations with a lower likelihood of causing gynecomastia may be beneficial. Surgeons in locations with minimal resources should modify their techniques and procedures when gynecomastia requires surgical intervention. For example, conducting bilateral excision without liposuction could be considered a surgical method simplification in order to attain positive outcomes without overly complicated instrumentation. Healthcare providers in limited-resource areas should work collaboratively with international organizations, NGOs, and local authorities to improve access to a wider range of antiretroviral drugs and resources. This can help expand treatment options and mitigate the occurrence of adverse events like gynecomastia.

CONCLUSION

Breast tissue removal without liposuction in patients with antiretroviral-related gynecomastia may nevertheless produce satisfactory results, despite the surgeon's inability to complete complex surgical procedures due to a lack of surgical instruments. However, it is imperative to provide accurate information regarding potential negative surgical effects.

ACKNOWLEDGMENTS

The authors would like to extend the deepest gratitude to our colleagues in Department of Surgery and Department of Anatomic Pathology, without whom this work will not be accomplished.

CONFLICT OF INTEREST

All authors have no conflict of interest in this study.

FUNDING DISCLOSURE

There is no funding disclosure in this study.

AUTHOR CONTRIBUTION

The conceptualization, study design and methodology, data collecting, and data analysis were all helped with by SHEH and RAD. RAD was the second revised manuscript. EPS helped with writing, revise, and the final approval of the completed work

REFERENCES

1. Shawarira-Bote S, Shamu T, & Chimbetete C. Gynecomastia in HIV-positive adult men receiving efavirenz-based antiretroviral therapy at Newlands clinic, Harare, Zimbabwe. BMC Infect Dis. 2019;19:1–6.
2. Sansone A, Romanelli F, Sansone M, Lenzi A, & Di Luigi L. Gynecomastia and hormones. Endocrine. 2017;55:37–44.
3. Paris F, Gaspari L, Mbou F, Philibert P, Audran F, Morel Y, et al. Endocrine and molecular investigations in a cohort of 25 adolescent males with prominent/persistent pubertal gynecomastia. Andrology. 2016;4:263–9.
4. Cutrupi A. Bilateral gynecomastia: a report of one case. Int J Pediatr Neonatal Heal. 2017;1:04–6.
5. Deepinder F, & Braunstein GD. Drug-induced gynecomastia: an evidence-based review. Expert Opin Drug Saf. 2012;11:779–95.
6. Bowman JD, Kim H, Bustamante JJ, Antunes M, Schiavone M, Pizzol D, et al. Bilateral Mastectomy as Radical Treatment of Gynecomastia Secondary to Antiretroviral Therapy in a Low-Income Setting: A Case Report. Drug Saf - Case Reports [Internet]. 2012;32:1123–40.
7. Strub C, Kaufmann GR, Flepp M, Egger M, Kahlert C, Cavassini M, et al. Gynecomastia and potent antiretroviral therapy. Vol. 18, AIDS (London, England). England; 2004. p. 1347–9.
8. van Ramshorst MS, Kekana M, Struthers HE, McIntyre JA, & Peters RPH. Efavirenz-induced gynecomastia in a prepubertal girl with human immunodeficiency virus infection: A case report. BMC Pediatr. 2013;13:1.
9. Antunes M, Schiavone M, Pizzol D, Di Gennaro F, Ludovico R, & De Palma A. Bilateral Mastectomy as Radical Treatment of Gynecomastia Secondary to Antiretroviral Therapy in a Low-Income Setting: A Case Report. Drug Saf - Case Reports [Internet]. 2018;5:1–4.
10. Song YN, Wang YB, Huang R, He XG, Zhang JF, Zhang GQ, et al. Surgical treatment of gynecomastia: Mastectomy compared to liposuction technique. Ann Plast Surg. 2014;73:275–8.
11. Eaton RG & Sperling RA. Grabb and Smith Plastic Surgery. 8th ed. Chung KC, editor. Vol. 8. 2019.
12. Baumann K. Gynecomastia-Conservative and Surgical Management. Breast Care. 2018;13:419–24.
13. Fagerlund A, Lewin R, Rufolo G, Elander A, Santanelli Di Pompeo F, & Selvaggi G. Gynecomastia: a systematic review. J Plast Surg Hand Surg. 2015;49:311–318
14. Zugang K & Hassan A. Combined approach for gynecomastia. GMS Interdiscip Plast Reconstr Surg. 2016; 5:1–12
15. Jose RM & Thomas S. Gynaecomastia correction—the role of power-assisted liposuction. Eur J Plast Surg. 2011; 34:187–191
16. Mohan A, Abbas Khan MA, Srinivasan K, & Roberts J. Gynaecomastia correction: a review of our experience. Indian J Plast Surg. 2014. 47:56–60
17. Prasetyono TOH, Budhipramono AG & Andromeda I. Liposuction assisted gynecomastia surgery with minimal periareolar incision: a systematic review. Aesthetic Plastic Surgery. 2022;46:123-131.
18. Swerdloff RS, Ng CM (2000) Gynecomastia: etiology, diagnosis, and

treatment. Endotext. PMID: 25905330 Available from: https://www.ncbi.nlm.nih.gov/books/NBK279105/
19. Polat S, Cuhaci N, Evranos B, Ersoy R, Cakir B (2014) Gynecomastia: clinical evaluation and management. Indian J Endocrinol Metab 18:150–159
20. Jarrar G, Peel A, Fahmy R, Deol H, Salih V, Mostafa A (2011) Single incision endoscopic surgery for gynaecomastia. J Plast Reconstr Aesthetic Surg. 2011. doi.org/10.1016/j.bjps.2011.04.016,May13,2011

JURNAL
REKONSTRUKSI DAN ESTETIK

A CASE REPORT: UNILATERAL COMPLETE CLEFT LIP RECONSTRUCTION USING THE MODIFICATION MILLARD TECHNIQUE

Rr. Theodora Ratih Labdagati Iswara[a], Muhammad Aulia Ul Hakim[b]*

[a]Medical Doctor, Intern of Plastic Reconstructive and Aesthetic Surgery Department, Sultan Agung Islamic Hospital, Semarang, Central Java, Indonesia
[b]Departement of Surgery, Sultan Agung Islamic Hospital, Semarang, Central Java, Indonesia

ARTICLE INFO

Keywords: Cleft lip and palate, craniomaxillofacial, labioplasty, medicine, Millard, reconstruction

***Corresponding author*:**
Muhammad Aulia Ul Hakim
Email address:
dr.ul.hakim@gmail.com

***History*:**
Received: March 3, 2023
Revised: May 25, 2023
Accepted: May 30, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2301-7937
DOI: 10.20473/jre.v8i1.43868
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Iswara RTRL & Hakim MAU. CASE REPORT: UNILATERAL COMPLETE CLEFT LIP RECONSTRUCTION USING THE MODIFICATION MILLARD TECHNIQUE. Jurnal Rekonstruksi dan Estetik.2023; 8(1): 14-20.

ABSTRACT

Introduction: With 1 in 700 live births worldwide, cleft lip with or without cleft palate is the most prevalent congenital craniomaxillofacial birth condition. More people have a unilateral cleft lip than a bilateral cleft lip. Except for vision, it can influence morphology and nearly all facial functions. The purpose of this study is to give an overview and learn more about the management of lip repair using the modified Millard approach, which can prevent straight-line closure and vermilion notching.

Case Illustration: We present a case of a 4-month-old male who underwent a modified Millard procedure and had a unilateral full cleft lip. The findings revealed no vermillion notch, acceptable columellar and alar lengths, symmetrical Cupid's bow, lip height, lip width, and philtrum angle.

Discussion: The modified Millard technique, including the Tennison triangular flap, improves the repair of cleft lips by preventing vermillion notching and reducing scar complications. It also addresses concerns related to lip tissue compromise and nostril deformities. Scar thinning techniques and separate nosography contribute to enhanced aesthetics and optimal healing. These modifications aim to achieve improved appearance and functionality in cleft lip repairs.

Conclusion: The modified Millard technique can be considered a viable option for treating unilateral cleft lip due to its ability to create a balanced Cupid's bow, maintain appropriate lip height and width, and achieve satisfactory aesthetic results in the nasal area without vermillion notching.

Highlights:

1. The modified Millard technique, including the Tennison triangular flap, is effective in preventing vermillion notching and reducing scar complications in cleft lip repairs.
2. The technique addresses concerns related to compromised lip tissue and nostril deformities, leading to improved appearance and functionality.
3. Scar thinning techniques and separate nosography contribute to enhanced aesthetics and optimal healing in cleft lip repairs.

INTRODUCTION

Cleft lip and palate (CLP) is the most common congenital craniomaxillofacial birth defect with 1 in 700 live births in the world. Cleft lip and palate are intricate conditions with a combination of various risk factors and are known to have a prevalence of 0.2% in Indonesia[1]. It is the second most prevalent congenital defect in the country[2]. The non-union of the top lip and roof of the mouth is known as cleft lip and palate, and it can happen when congenital abnormalities develop significantly in both shape and severity[3].

A unilateral cleft is more common than a bilateral cleft lip[4]. There are various etiologies of this disease, including ethnic, racial, geographic, and socioeconomic factors, and smoking habits[5,6]. Bilateral clefts are twice as challenging as unilateral clefts, and the outcomes are only slightly better. There are a variety of techniques for treating bilateral clefts with various timings for each surgery, 1 or 2 stages, and diverse associated procedures like rhinoplasty. However, due to symmetry issues, a short columella, or a wide nasolabial angle, the outcomes of bilateral cleft surgery may be modest. To enhance treatment protocols, it is critical to evaluate treatment results[4]. Techniques that are often used to repair unilateral cleft lip are Millard and Tennison. However, both of these techniques have advantages and disadvantages depending on the patient variation, measurement of the cleft, and time of evaluation. In recent times, numerous surgeons have been devising different approaches to effectively repair complete unilateral cleft lips, aiming to achieve improved outcomes in the surgical results[7,8].

The purpose of surgical correction for a unilateral cleft lip is to enhance both the functional and aesthetic aspects of the lip while ensuring proper anatomical reconstruction. Performing cleft palate repair between the ages of 10 to 12 months is recommended. This timeline allows for the maturation of postoperative scar tissue, which softens over time and contributes to optimal speech outcomes. Delaying cleft palate repair beyond this timeframe may elevate the risk of speech function disorders[9]. Asymmetrical upper lip with a natural-looking philtral column length on either side characterizes the ideal outcome. To conceal the scar, the scar must reflect the opposite side, not extend past the philtral column, and not have vermilion notching[10,11]. This study aims to provide an overview and learn more about the management of lip repair with the modified Millard technique to get a better result.

CASE ILLUSTRATION

A 4-month-old male comes to the Plastic Surgery Department with his parents and complains of a cleft lip on the left side up to the nostrils since birth. There's no family history of cleft lip or cleft palate. Before and during pregnancy, the patient's mother did not consume drugs that could interfere with the process of fetal formation.

A physical examination of the patient found a complete cleft lip on the left side and there's no cleft palate (Figure 1). A thorough examination was carried out for the preparation of general anesthesia including routine blood tests (hemoglobin, erythrocytes, leukocytes, platelets, Bt, Ct), and chest X-rays. The results are within normal limits. The patient is also examined to ensure that he is free from other congenital diseases.

Figure 1. Pre- reconstruction surgery.

On preoperative examination, the patient is confirmed to have fulfilled the rule over ten (age: 12 weeks; weight: 6.5 kgs; Hb: 12.4 g/dL). The surgery was performed under general anesthesia. Reconstruction begins by disinfecting the area to be operated on and drawing an incision design on the patient's lips. The design used is Millard's design which is modified by providing a triangle on the side of the lip slit to make a flap. Then an incision is made according to the design and undermining is carried out to separate the tissue so that it can be rotated and sutured according to anatomical shape appropriately. The triangular flap from the lateral side is tucked into the corner on the medial side of the fissure just above the vermilion border, across the philtral neck to the apex of the cupid (Figure 2).

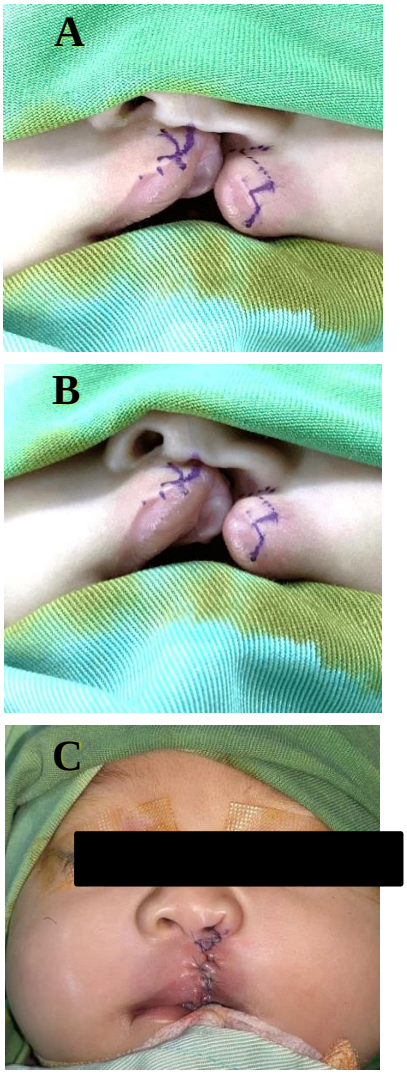


Figure 2. (A, B) Modification of Millard's design; (C) Post-reconstruction result.

Evaluation one month after reconstruction, the results showed that there was no vermillion notch, lip height, lip width, or philtrum angle, and Cupid's bow appeared symmetrical, and acceptable columellar and alar lengths (Figure 3).

Figure 3. Evaluation one-month post-reconstruction surgery

DISCUSSIONS

Bilateral cleft lip occurs less frequently than unilateral clefts. Surgeons are trying to determine the best way to handle it as a result of this. Since it can create a natural philtral column, the rotation-advancement technique described by Millard remains one of the most used repair techniques for cleft lip restoration. However, the majority of surgeons utilize a modified version of the rotation-advancement flap[12,13].

The triangular flap procedure has a wide range of applications and can be used to repair clefts of all sizes, from little to very large. Tennison's triangular flap, however, has been criticized since the lower triangle encroaches on the philtral region and is hence unsightly[14].

In this case, we use a modified Millard design with Tennison (Figure 4) because, besides being expected to fill the deficiencies of each technique, basically they have the same geometric principles even though the results are different (Figure 5). Geometric analysis is necessary for cheiloplasty design. Sufficient descent of the peak points of Cupid's bow near the cleft edge is the most important requisite in cheiloplasty. Existing incision designs are based on geometric principles, taking into account factors affecting the rotation of the apex on the cleft side. However, surgeons are always more concerned with the length of the incision than the location of key points such as the top edge of the incision. This is one reason why only skilled surgeons can successfully treat many types of deformities. According to Bing Shi, a successful cheiloplasty method must adhere to a design that follows geometrical principles and can, to the maximum extent possible, restore and rebuild natural anatomical components[15].

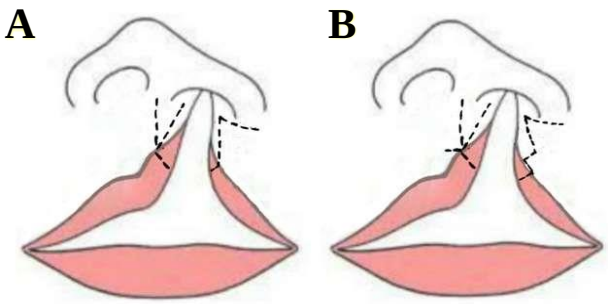


Figure 4. (A) Classic Millard's technique; (B) Modification Millard's technique.

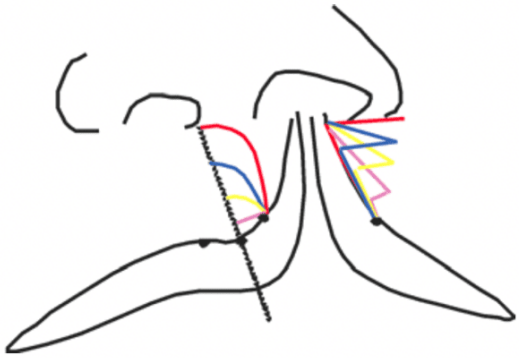


Figure 5. Geometric lines of Classic Millard's technique (red line) and Tennison's technique (purple line)[15]

In this case, the technique choice has the purpose to restore the lip function with an acceptable appearance. The good result must be symmetrical lips, look natural, and a faint scar. This modification Millard technique is expected to able to avoid straight-line closure and vermilion notching. As a result, there's no vermillion notch, got a symmetrical lip length, Cupid's bow, and acceptable columellar and alar lengths.

Vermilion notching develops in repaired lips as a consequence of the inadequate rotation of the medial lip segment, lack of most muscle in the vermilion, and scar contracture along the cutaneous or mucosal aspect of the lip. The Tennison triangular flap from the lateral side that tucked into a corner on the medial side of the fissure just above the vermillion border, across the philtral neck to the apex cupid can add length on the shortest side of the lips and avoid the vermillion notch[7,14]. Due to research by Alkebsi et al. showing that patients who received the modified rotation advancement technique had better aesthetic results, the surgeons modified the Millard technique to address the drawbacks of the classical technique and to achieve better results than the classical method[16].

The Classic Millard technique often results in straight lines scars and vermillion notches. The Tennison technique's scars are zig-zag lines that have a minimal propensity for hypertrophy and are easily camouflaged. The Tennison technique does have one limitation: it tends to produce lips that are overly lengthy vertically because a scar forms on the philtrum in its lower third[17]. Scar thinning can be overcome by applying silicone gel with light massage in the direction of the stitches on the wound.

The disadvantages of the Classic Millard technique are that if the lateral lip segment has a shorter vertical height, the method may occasionally compromise the mucosa and lip tissue, as this technique requires significant undermining and may result in a small nostril. Therefore, in this modified Millard technique, the two points of closure along the nostril floor are designed so that when they are brought together the nasal deformity is corrected. From these two points, corresponding lines are dropped to the cleft Cupid's bow peak medially and to the base of the triangular flap laterally[18,19,20].

There is no definite benchmark for doing nosography. Some centers perform nosography at the same time as chirography, but we chose to delay nosography in this patient with the consideration that apart from not interfering with function, the nose is also a center for facial growth, so we will do nosography in stages after the post chirography wound heals properly to get better results.

This case provides a concise and comprehensive overview of cleft lip as a common congenital birth defect. It covers various aspects, such as scar appearance, vermilion notching, lip length, and nasal deformity correction. The importance of surgical repair in improving both the functional and aesthetic aspects of the lip. It effectively Introduces the modified Millard technique as a method to avoid straight-line closure and vermillion notching, which can lead to symmetrical and natural-looking results. The decision to delay nosography to ensure proper healing reflects a thoughtful approach to achieving optimal results.

CONCLUSION

The modified Millard technique offers a potential solution for addressing unilateral cleft lip by ensuring a leveled Cupid's bow, maintaining lip height and width, and achieving satisfactory aesthetic results in the nasal area. Additionally, this technique effectively avoids vermillion notching, resulting in improved outcomes for patients. The Millard technique, a modification of the

traditional approach, can be considered a viable option for managing unilateral cleft lip. This technique addresses several important aspects of aesthetic outcomes, such as leveling the Cupid's bow while preserving lip height and width. Additionally, the Millard technique has shown satisfactory nasal outcomes aesthetically, and it effectively avoids vermillion notching, a common concern in cleft lip repair. Overall, the Millard technique offers a comprehensive approach to unilateral cleft lip management, combining favorable cosmetic results with functional considerations.

ACKNOWLEDGMENTS

We thank the Medical Doctor, Intern of Plastic Reconstructive and Aesthetic Surgery Departement and Departement of Surgery, Sultan Agung Islamic Hospital, Semarang, Central Java, Indonesia, and also our patient and their families who gave us their consent to report their cases in our paper.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare in this article.

FUNDING DISCLOSURE

This research has no financial interest or affiliation concerning material.

AUTHOR CONTRIBUTION

RTRLI was conceptual the manuscript, MAUH was written, revise, conceptual, and data analysis collection

REFERENCES

1. Moegni K, Suryadinata K, Sisca F. Analyzing Parental Age to Determine Types of Cleft in Hayandra Peduli Foundation Patient, Indonesia. *J Profesi Med J Kedokt dan Kesehat*; 14. Epub ahead of print 26 May 2021. DOI: 10.33533/jpm.v14i2.2244.
2. Khamila N, Agus Nurwiadh A & PF. Characteristic of Cleft Lip and Palate at Cleft Center of Padjadjaran University Dental Hospital: 2 Years Retrospective Study. *J Pendidik Tambusai* 2022; 6: 1058–1064.
3. Huqh MZU, Abdullah JY, Wong LS, et al. Clinical Applications of Artificial Intelligence and Machine Learning in Children with Cleft Lip and Palate-A Systematic Review. *Int J Environ Res Public Health*; 19. Epub ahead of print August 2022. DOI: 10.3390/ijerph191710860.
4. Aljancic L, Rougier G, Neiva-Vaz C, et al. Millard's modified technique in the reconstruction of bilateral cleft lip: Objective and subjective assessment. *J Stomatol oral Maxillofac Surg* 2022; 123: 532–537.
5. Yılmaz HN, Özbilen EÖ, Üstün T. The Prevalence of Cleft Lip and Palate Patients: A Single-Center Experience for 17 Years. *Turkish J Orthod* 2019; 32: 139–144.
6. Auslander A, McKean-Cowdin R, Brindopke F, et al. The role of smoke from cooking indoors over an open flame and parental smoking on the risk of cleft lip and palate: A case- control study in 7 low-resource countries. *J Glob Health*; 10. Epub ahead of print 14 August 2020. DOI: 10.7189/jogh.10.020410.
7. F GA& J. Perbandingan Estetika Post Labioplasty Unilateral antara Teknik Millard dengan Teknik Tennison. *UMI Med J* 2022; 7: 1–9.
8. Zaleckas L, Linkevičienė L, Olekas J, et al. The comparison of different surgical techniques used for repair of complete unilateral cleft lip.

Medicina (Kaunas) 2011; 47: 85–90.
9. Ningrum LP, Saputro ID & ZL. Correlation of Parents' Profile of Children with Late Cleft Repair in Surabaya Cleft Lip and Palate Centre (January 2015 – December 2017). *J Rekonstruksi dan Estet* 2021; 5: 18–22.
10. ElMaghraby MF, Ghozlan NA, Ashry MH, et al. Comparative study between fisher anatomical subunit approximation technique and millard rotation- advancement technique in unilateral cleft lip repair. *Alexandria J Med* 2021; 57: 92–102.
11. Adetayo AM, Adetayo MO, Adeyemo WL, et al. Unilateral cleft lip: evaluation and comparison of treatment outcome with two surgical techniques based on qualitative (subject/guardian and professional) assessment. *J Korean Assoc Oral Maxillofac Surg* 2019; 45: 141–151.
12. Knežević P, Grgurević L, Uglešić V, et al. Modified Millard's technique in operations for unilateral cleft lip. *J Plast Surg Hand Surg* 2012; 46: 326–329.
13. Han K, Park J, Lee S, et al. Personal technique for definite repair of complete unilateral cleft lip: modified Millard technique. *Arch craniofacial Surg* 2018; 19: 3–12.
14. RK S. Triangular flap technique for unilateral cleft lip deformity. *J Cleft Lip Palate Craniofac Anomal* 2021; 8: 163–8.
15. Shi Bing & Sommerlad Brian. *Cleft Lip and Palate Primary Repair*. Zhejiang University Press: Springer, 2013.
16. Alkebsi K, Li C, Aonan X, et al. Cupid's Bow Leveling and Preservation of Lip Height and Width: A Modified rotation-advancement Technique. *Plast Reconstr Surg*. Epub ahead of print January 2023. DOI: 10.1097/PRS.0000000000010229.
17. Adetayo AM, James O, Adeyemo WL, et al. Unilateral cleft lip repair: a comparison of treatment outcome with two surgical techniques using quantitative (anthropometry) assessment. *J Korean Assoc Oral Maxillofac Surg* 2018; 44: 3–11.
18. Elayah SA, Sakran KA, Alkebsi K, et al. Primary unilateral incomplete cleft lip repair by a modified rotational advancement technique. *J Stomatol Oral Maxillofac Surg* 2023; 124: 101325.
19. Tse R. Unilateral cleft lip: principles and practice of surgical management. *Semin Plast Surg* 2012; 26: 145–155.
20. Dunitz MR& M. *Cleft Lip and Palate Primary Repair*. The Lip an. CRC Press: Taylor & Francis Group, 2000.

JURNAL
REKONSTRUKSI DAN ESTETIK

THE EPIDEMIOLOGY OF PLASTIC SURGERY CASES IN A TERTIARY GENERAL HOSPITAL IN SURABAYA, INDONESIA

Dwika Intania Riano[aÌÂ¢], Lavonia Berlina Adzalika[a], Rachmaniar Pramanasari[c]

[a]Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia
[b]Department of Plastic Reconstructive and Aesthetic Surgery, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[c]Indonesian Association of Plastic Reconstructive and Aesthetic Surgeons, Jakarta, Indonesia

ARTICLE INFO

Keywords: Antiretroviral, gynecomastia, HIV, human immunodeficiency

***Corresponding author*:**
$ ×iËa)ntania 2ianÏ
Email address:
d×iËair27@fË.unair.ac.id

***History*:**
Received: April 8, 2023
Revised: May 13, 2023
Accepted: May 25, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2684-9453
DOI: 10.20473/jre.v8i1.45272
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Riano DI, Adzalika LB, & Pramanasari R. THE EPIDEMIOLOGY OF PLASTIC SURGERY CASES IN A TERTIARY GENERAL HOSPITAL IN SURABAYA, INDONESIA. Jurnal Rekonstruksi dan Estetik.2023; 8(1): 21-28.

ABSTRACT

Introduction: Medical data registries are useful databases with well-defined data collection mechanisms. A well-designed and implemented registry can give surgeons a wealth of data for research and quality improvement efforts. The aim is to describe the epidemiology of plastic surgery cases in a tertiary general hospital in Surabaya, Indonesia.
Methods: A retrospective assessment of patient's medical records from 2016 to 2019 at the Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia was conducted. A variety of factors were recorded and evaluated, including the patient's age, gender, diagnosis, and year.
Results: We found that among 736 individuals' medical records during four years, burn injuries (17.4%), microtia (11.7%), and orofacial clefts (11.5%) were the most prevalent occurrences. The majority of patients with burn injuries (31.3%), those with microtia (39.5%), those with cleft lip and palate (33%), and those with microtia (between the ages of 15 and 24) were all between the ages of 45 and 64. Patients who were men (52.6%) outnumbered those who were women (47.4%). This data indicates that there were more patients in 2019 than in previous years (397.%).
Conclusion: The analysis of plastic surgery cases revealed a steady increase in the number of cases each year. Burns accounted for the biggest percentage of patient requests for care (17.4%). The majority of patients were male, and 21.9% of them were between the ages of 15 and 24 and were seeking care most frequently.

Highlights:

1. Medical data registries play a crucial role in improving medical knowledge and enhancing patient care.
2. Burn injuries, microtia, and orofacial clefts were identified as the most common occurrences among the patients
3. The demographic patterns observed provide valuable insights into the patient population seeking plastic surgery services.

INTRODUCTION

The global discrepancy in surgical treatment across social and economic strata is a well-known issue. The global burden of disability from surgical disease is estimated to be 11%, which is higher than the combined burdens of HIV, tuberculosis, and malaria[1]. Health is defined by the World Health Organization (WHO) as a condition of physical, mental, and social well-being. This notion of health now encompasses the ability to live a productive social and economic life. Imperfections and abnormalities on the body's surface, whether expressed or perceived, represent a sickness[2]. Plastic surgery must deal with it and attempt to restore health, with the priority in any surgery being to protect life, restore function, and achieve a normal appearance[3]. Plastic surgeons treat burns, severe injuries, infections, and congenital deformities, which are believed to account for half of all surgical problems worldwide[1].

The epidemiology of plastic surgery diseases has only been studied in a few studies. This study's goal is to describe the epidemiology of plastic surgery cases at Airlangga University Hospital in Surabaya.

Dr. Soetomo General Academic Hospital opened in 2011 and is located on Campus C of Airlangga University in Mulyorejo, East Java, Surabaya. This hospital is a category B hospital, which implies it can provide complete medical services, medical experts, and subspecialists, as well as serve as a research facility in Surabaya, East Java.

METHODS

Over four years (2016 to 2019), the records of all patients who presented for cases in Dr. Soetomo General Academic Hospital's cosmetic reconstructive and aesthetic surgery section were evaluated. A specific form was used to collect patient information. Age, gender, and case data were acquired from relevant hospital inpatient and outpatient records. All patients with plastic surgery cases were included in this study, whether they were admitted to the hospital and treated in the operating room or seen as outpatients. The study protocol was approved by the local ethics committees of the institutional research board to conduct this study. The reference number is 201/KEH/2019.

RESULTS

A retrospective clinical analysis was conducted over 4 years, reviewing and evaluating the medical records of 736 patients at the Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia from January 2016 to December 2019. The data revealed an increasing trend in patient admissions from 2016 to 2019, indicating a rise in the number of cases. Specifically, there were 81 cases (11.0%) in 2016, 159 cases (21.6%) in 2017, 204 cases (26.7%) in 2018, and 292 cases (30.7%) in 2019, as depicted in the graph.

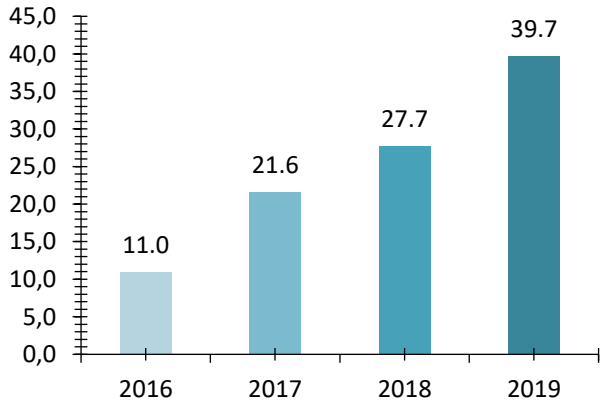


Figure 1. Percent number of cases per year in Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic (2016 to 2019)

We discovered that from January 2016 to December 2019, there were 387 male patients (52.6%) and 349 female patients (47.3%) registered in the Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

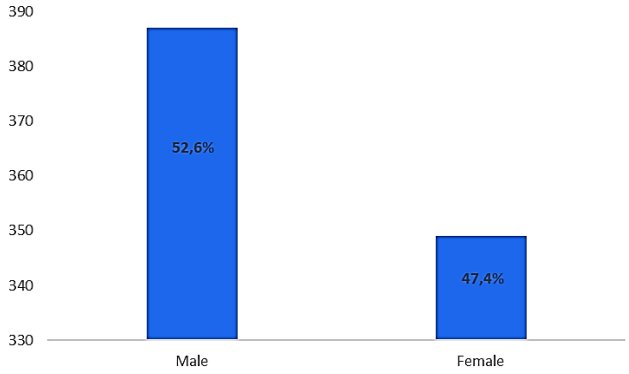


Figure 2. Sex distribution of 736 patients in the Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic (2016 to 2019)

The patients in this study were separated into six age groups: up to four years (90 patients), five to fourteen years (125 patients), fifteen to twenty-four years (160 patients), twenty-four years (160 patients), forty-four years (138 patients), and more than sixty years (62 patients) (8.4%).

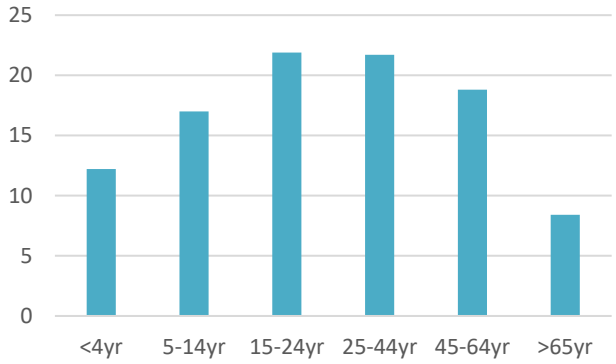


Figure 3. Age Distribution in Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic (2016 to 2019)

The number of burn injury patients treated at Dr. Soetomo General Academic Hospital's Plastic Reconstructive and Aesthetic Surgery Unit increased from 2016 to 2019, according to the findings of this study. Burn cases were discovered to be the most common, accounting for as many as 128 instances (17.4%), and the age group with the most frequent burns was 45-64 years (31.3%) (Table 1).

Table 1. Number of burn cases (2016 to 2019)

	Number of cases (n)	**Value n (%)**
Year	128	
2016		10 (7.8%)
2017		28 (21.9%)
2018		30 (23.4%)
2019		60 (46.9%)
Age	128	
<4yr		21 (16.4%)
5-14yr		16 (12.5%)
15-24yr		22 (17.2%)
25-44yr		21 (16.4%)
45-64yr		40 (31.3%)
>65yr		8 (6.2%)

Academic General Hospital Universitas Airlangga, Surabaya is the main hospital in Surabaya for microtia patients in East Java. This is why microtia became one of the most common examples discovered in this investigation (Table 2).

In this study, there were 85 patients treated with an orofacial cleft. Most patients who came were aged <4 years old (33%) and at least patients were aged 4-64 years old (4.7) from January 2016 to December 2019. Following this information, female patients (54.1%) were more frequently discovered than male patients (45.9%) (Table 3).

Table 2. Number of Microtia cases (2016 to 2019)

	Number of cases (n)	Value n (%)
Sex	86	
Male		51 (59.3%)
Female		35 (40.7%)
Age	86	
<4yr		11 (12.8%)
5-14yr		25 (29.1%)
15-24yr		34 (39.5%)
25-44yr		13 (15.1%)
45-64yr		2 (2.3%)
>65yr		1 (1.2%)

Table 3. Number of Orofacial cleft cases (2016 to 2019)

	Number of cases (n)	Value n (%)
Sex	85	
Male		39 (45.9 %)
Female		46 (54.1 %)
Age	85	
<4yr		28 (33%)
5-14yr		26 (30.6%)
15-24yr		11 (12.9%)
25-44yr		16 (18.8%)
45-64yr		4 (4.7%)

In comparison to a previously published study in the literature, corroborate the hypothesis that the occurrence and characteristics of plastic surgery cases differ among countries. This indicates the potential to develop specific preventive and treatment programs for plastic surgery based on the epidemiological patterns observed.

DISCUSSIONS

According to these statistics result, the most prevalent cases in Plastic Reconstructive and Aesthetic Surgery Unit, Academic General Hospital Dr. Soetomo, Surabaya, Indonesia from 2016 to 2019 were burns (128 cases (17.4%)), microtia (86 cases (11.7%)), and orofacial cleft (OC) as many as 85 cases (11.5%).

Burns is one of the most devastating types of trauma in the world 4. Burn injuries have painful physical, economic, social, psychological, and emotional implications that affect one's health and quality of life significantly[5]. Over 95% of burns occur in developing countries. Developing countries account for more than 95% of all burns. Southeast Asia has the greatest burn fatality rate (11.6 deaths per 100,000 people per year), followed by the Eastern Mediterranean (6.4 deaths per 100,000 population per year) and Africa (6.1 deaths per 100,000 population per year)[6].

This study shows that from 2016 to 2019, more patients with burn injuries sought treatment at the Plastic Reconstructive and Aesthetic Surgery Unit at Airlangga University Hospital. As many as 128 burn cases (17.4%) were found to be the most frequent type of injury, while 45–64-year-olds (31.3%) were found to be the age group with the highest percentage of burns. While, according to Ciptomangunkusumo Hospital (RSCM) research, the most common cause of burn damage is a gas explosion (35.7%), followed by flame (26.7%), scald (16.6%), electrical (11.7%), others that include contact and vapor (4.9%), and chemical (4.4%). It also revealed that the age group with the highest incidence was 16-35 years old (269 patients), with a higher number of males admitted 186 (69.1%) than females admitted 83 (30.9%), followed by the age group 36-55 years old (197 patients), with 128 males and 69 females[7]. As mentioned in the literature, more than 60% of burn patients are in their productive years. Burns are more common in the young adult age group because they are of productive age and thus have a higher risk of exposure to the variables that cause burns[8].

Microtia, characterized by a small and/or deformed ear, emerged as the second most prevalent condition in this study. The most severe form of microtia is anotia, where the external ear is completely absent. The prevalence of microtia varies significantly depending on geographic location, with an estimated occurrence of one in every 7,000-8,000 live births. There is a higher prevalence of microtia among Hispanic, Asian, and Native American populations[9,10].

Although various syndromic presentations of microtia have been documented, the most common form (77%-93%) is a solitary, unilateral abnormality[11]. A previous study conducted by The National Birth Defects Prevention Study (NBDPS) in 2019 reported 480 cases (69%) of isolated microtia and 210 cases (31%) of non-isolated microtia. Among these cases, 608 (87%) were unilateral defects, 88 (13%) were bilateral defects, and 3 (1%) had undefined laterality[12].

Microtia exhibits a higher prevalence in males, with a perceived risk that is 20-40% greater than in females. While microtia can occur bilaterally, the majority of cases (77-93%) involve unilateral involvement[9]. Among cases of unilateral microtia, approximately 60% affect the right ear. A previous study conducted in South America identified 1,194 cases of microtia, with males comprising 56.6% of the cases. Among the patients, 82.0% had unilateral microtia, and within this group, the right side was affected in 65.6% of individuals[14]. In this study, there were more male patients with microtia than female individuals. It has also been continuously demonstrated that microtia is more common in males (59.3%) than females (40.7%), and it is more common between the ages of 15 and 24 (39.5%) (Table 2).

One of the most challenging procedures for otolaryngologists and plastic surgeons is the reconstruction of the outer ear. It has been shown to improve psychological and audiological function[15]. Reconstruction of microtia, regardless of kind, necessitates two essential components. The first step is to build an autologous costal cartilage framework, and the second step is to cover the framework with a combination of skin from the cutaneous remnant, neighboring skin, and skin grafts. The majority, if not all, of the rebuilding, can be completed in two stages, with only minor adjustments required beyond these two surgeries. Rib cartilage of sufficient size and form is necessary for optimal restoration to sculpt important structural elements and retain the force required to view these details through the upper skin. Optimal outcomes are achieved by commencing reconstruction for microtia at the age of 9 to 10 years or later. This age range is preferred due to the favorable cartilage width and length, which provide the superior raw material for the reconstruction process[16].

East Java's primary hospital for microtia patients is Dr. Soetomo general academic hospital. Because of this, microtia was one of the most frequent cases found during our examination. Among these cases, the majority were male, and the age group most affected was between 15 to 24 years, accounting for 21.9% of the patients.

Orofacial cleft congenital emerged as the third most common type of case. Approximately 15% of newborns are affected by congenital abnormalities in the craniofacial and oral regions, with orofacial clefts being the most prevalent. Orofacial clefts can manifest in the lip, the hard palate (the root of the mouth), or the soft tissue behind the mouth (soft palate). Additionally, structures surrounding the oral cavity are also involved in these cases[17,18].

The occurrence of congenital defects such as orofacial clefts is estimated to affect one in every 700 to 1000 babies. The prevalence varies across different regions, with higher rates observed in Asia and Latin

America (1 in 500 births), lower rates in the Caucasian race (1 in 1000 births), and even lower rates in the African-American race (1 in 2000 births)[19]. Various factors, including race, ethnicity, socioeconomic status, and geographical location, can influence the prevalence of clefts due to their complex etiology[20].

The prevalence of cleft lip and palate (CLP) exhibits a male predominance, with a male-to-female gender ratio of 1.81. Conversely, cleft palate (CP) has a slightly lower prevalence in males, with a gender ratio of 0.93 [21]. In a specific study conducted at the Yayasan Surabaya CLP center, it was reported that 236 patients underwent surgery in 2017. Among them, CLP patients accounted for the majority (69%), with 130 more male patients treated compared to female patients (106 patients)[22].

Previous studies have shown that Indonesia has the highest number of facial cleft sufferers per population in the world[23]. According to the Smile Train organization's database, show that up to 8,900 newborns in Indonesia are born each year with orofacial clefts. Because they are unaware that the gap can be closed for free, more than half of patients do not receive treatment; some low-income patients even just pay for transportation to the hospital[24].

From January 2016 to December 2019, 85 patients with an orofacial cleft were treated at Academic General Hospital Dr. Soetomo, with the majority of patients being under the age of four (33%). Female patients (54.1%) were found to be more prevalent than male patients (45.9%). The best period for palate repair with favorable postoperative results is between the ages of 3 and 6 months.

The majority of patients for treatment of an orofacial cleft were under the age of four (33%) between January 2016 and December 2019. There were 85 patients in this study. Following this information, female patients (54.1%) were more frequently discovered than male patients (45.9%) (Table 3). Lip and palate repairs are best performed before the age of one-year-old to ensure positive postoperative outcomes.

Our study has certain limitations. Because the sampling period was limited to three years and we only reported the three most common cases, we were unable to present a detailed picture of the most common cases of plastic surgery at Airlangga University. While the strength of this study lies in its clear and concise summary of the key findings presented in the study. It effectively highlights the main results, such as the steady increase in plastic surgery cases over the years, the prevalence of burn injuries, the majority of male patients, and the age group most commonly seeking treatment. By succinctly summarizing the findings, it provides a comprehensive overview of the study's main outcomes in a straightforward manner.

CONCLUSION

The data from the Plastic Reconstructive and Aesthetic Surgery Unit at Dr. Soetomo General Academic in Surabaya from January 2016 to December 2019 revealed a significant increase in the number of plastic surgery cases over the years. The highest number of cases occurred in 2019, with 292 cases, representing 39.7% of the total cases during the period. Among the various types of cases, burns were the most prevalent, accounting for 17.4% of all cases. The majority of patients seeking treatment were men (52.6%), and the highest percentage of patients fell within the age range of 15 to 24 years (21.9%). These findings provide valuable insights into the plastic surgery landscape at the hospital and highlight the specific demographics and conditions that require attention and specialized care.

ACKNOWLEDGMENTS

The authors would like to thank Plastic Reconstructive and Aesthetic Surgery Unit, Dr. Soetomo General Academic Hospital, and Department of Plastic Reconstructive and Aesthetic Surgery, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia for supporting this study.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

FUNDING DISCLOSURE

None.

AUTHOR CONTRIBUTION

DIR and LBA were including preparation and data gathering, RP writing the manuscript and analysis drafting, and ILP revised and approved for publication of this manuscript.

REFERENCES

1. Debas HT, Gosselin R, McCord C, et al. Surgery. In: Jamison DT, Breman JG, Measham AR, et al., editors. Disease Control Priorities in Developing Countries. 2nd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2006. Chapter 67. Available from: https://www.ncbi.nlm.nih.gov/books/NBK11719/Co-published by Oxford University Press, New York.
2. WHO.int. Constitution of The World Health Organization [Internet]. 2006 [updated 2020; cited 2020 February 25]. Available from: http://www.who.int/governance/eb/constitution/en/.
3. Chrysopoulo M. What's the difference between reconstructive and cosmetic procedures? [Internet]. San Antonio: American Society of Plastic Surgeons. 2018 [updated 2018 January 12; cited 2020 February 25]. Available from: https://www.plasticsurgery.org/news/blog/whats-the-difference-between-reconstructive-and-cosmetic-procedures.
4. Rani M, Schwacha MG. Aging and the pathogenic response to burn. Aging Dis. 2012 Apr;3(2):171-80. Epub 2011 Jul 4. PMID: 22724078; PMCID: PMC3377829.
5. Saaiq M, Ashraf B. Epidemiology and outcome of self-inflicted burns at pakistan institute of medical sciences, Islamabad. World J Plast Surg. 2014 Jul;3(2):107-14. PMID: 25489533; PMCID: PMC4236991.
6. WHO.int. Burns [Internet]. 2018 [updated 2018 March 6; cited 2020 February 25]. Available from: https://www.who.int/news-room/fact-sheets/detail/burns.
7. Wardhana A, Winarno GA. Epidemiology And Mortality Of Burn Injury In Ciptomangunkusumo Hospital, Jakarta: A 5-Year Retrospective Study. Jurnal Plastik Rekonstruksi. 2019;6(1):45-9. doi:10.14228/jpr.v6i1.270
8. Sabiston DC. Buku ajar bedah bagian 1. In: *Edisi 1*. 1st ed. EGC.
9. Canfield MA, Langlois PH, Nguyen LM, Scheuerle AE. Epidemiologic features and clinical subgroups of anotia/microtia in Texas. *Birth Defects Res A Clin Mol Teratol*. 2009;85(11):905-913. doi:10.1002/bdra.20626
10. Baluch N, Nagata S, Park C, Wilkes GH, Reinisch J, Kasrai L, Fisher D. Auricular reconstruction for microtia: A review of available methods. Plast Surg (Oakv). 2014 Spring;22(1):39-43. PMID: 25152646; PMCID: PMC4128432.
11. Luquetti DV, Leoncini E, Mastroiacovo P. Microtia-anotia: a global review of prevalence rates. *Birth Defects Res A Clin*

Mol Teratol. 2011;91(9):813-822. doi:10.1002/bdra.20836
12. Ryan MA, Olshan AF, Canfield MA, et al. Sociodemographic, health behavioral, and clinical risk factors for anotia/microtia in a population-based case-control study. *Int J Pediatr Otorhinolaryngol*. 2019;122:18-26. doi:10.1016/j.ijporl.2019.03.026
13. González-Andrade F, Lopez-Pulles R, Espín VH, Paz-y-Miño C. High altitude and microtia in Ecuadorian patients. Journal of Neonatal-Perinatal Medicine. 2010 Jan 1;3(2):109-16. doi:103233/NPM-2010-0102
14. Luquetti D V, Saltzman BS, Lopez-Camelo J, Dutra M da G, Castilla EE. Risk factors and demographics for microtia in South America: a case-control analysis. *Birth Defects Res A Clin Mol Teratol*. 2013;97(11):736-743. doi:10.1002/bdra.23193
15. Johns AL, Lucash RE, Im DD, Lewin SL. Pre and post-operative psychological functioning in younger and older children with microtia. *J Plast Reconstr Aesthet Surg*. 2015;68(4):492-497. doi:10.1016/j.bjps.2014.12.019
16. Nagata S. A new method of total reconstruction of the auricle for microtia. *Plast Reconstr Surg*. 1993;92(2):187-201. doi:10.1097/00006534-199308000-00001
17. Allareddy V. Orthognathic Surgeries in Patients With Congenital Craniofacial Anomalies: Profile and Hospitalization Outcomes. *Cleft Palate Craniofac J*. 2015;52(6):698-705. doi:10.1597/14-195
18. Agbenorku P. Orofacial clefts: a worldwide review of the problem. International Scholarly Research Notices. 2013;2013. doi:10.5402/2013/348465
19. Tollefson TT SJ. Unilateral cleft lip. In: Complete cleft care, ed. *Thieme*. ; 2014:37-59.
20. Altunhan H, Annagür A, Konak M, Ertuğrul S, Ors R, Koç H. The incidence of congenital anomalies associated with cleft palate/cleft lip and palate in neonates in the Konya region, Turkey. *Br J Oral Maxillofac Surg*. 2012;50(6):541-544. doi:10.1016/j.bjoms.2011.08.001
21. Mossey PA, Catilla EE. Global registry and database on craniofacial anomalies: report of a WHO Registry Meeting on Craniofacial Anomalies.
22. Triwardhani A, Permatasari GW, Sjamsudin J. Variation of Non-syndromic Cleft Lip/Palate in Yayasan Surabaya Cleft Lip/Palate Center Surabaya, Indonesia. Journal of International Oral Health. 2019;11(4):187-90.
23. Willcox DS. Cleft palate rehabilitation: interim strategies in Indonesia. *Cleft Palate Craniofac J*. 1994;31(4):316-320. doi:10.1597/1545-1569_1994_031_0316_cprisi_2.3.co_2
24. SmileTrainIndonesia.org. Kelahiran Sumbing [Internet]. 2018. [updated 2018; cited 2020 February 25]. Available from: https://www.smiletrainindonesia.org/the-problem/cleft-births.html.

JURNAL
REKONSTRUKSI DAN ESTETIK

ANALYSIS OF MAXILLARY FRACTURE PATIENTS PROFILE IN A TERTIARY GENERAL HOSPITAL (2018-2020)

I Dewa Gde Daniswara Suarta[a], Agus Santoso Budi[b]*, Rosy Setiawati[c], Magda Rosalina Hutagalung[d]

[a]Department of Anatomy, Histology, and Pharmacology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[b]Department of Plastic Reconstructive and Aesthetic Surgery, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[c]Musculoskeletal Consultant of Indonesian Musculoskeletal Radiologist Society (IMRS), Surabaya, Indonesia
[d]Australian Craniofacial Unit, Adelaide, South Australia, Australia

ARTICLE INFO

Keywords: Human risk, Le Fort Fractures, maxillary fracture, medicine

***Corresponding author*:**
Agus Santoso Budi
Email address:
agus.santoso@fk.unair.ac.id

***History*:**
Received: April 7, 2023
Revised: May 12, 2023
Accepted: May 22, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2301-7937
DOI: 10.20473/jre.v8i1.37353
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Suarta IDG, Budi AS, Setiawati R & Hutagalung MR. ANALYSIS OF MAXILLARY FRACTURE PATIENTS PROFILE IN A TERTIARY GENERAL HOSPITAL (2018-2020). Jurnal Rekonstruksi dan Estetik.2023; 8(1): 29-38.

ABSTRACT

Introduction: The maxilla is a crucial bone in the midface, playing a significant role both functionally and cosmetically. Analyzing the medical records of maxillary fractures at Dr. Soetomo General Academic Hospital would offer an overview of the various treatments used and their corresponding outcomes were the aim of this study. This data would provide a general understanding of the patient's conditions during maxillary fracture treatment and could potentially support further research in this field.

Methods: In this study, data on the profile, treatment, and management of maxillary fractures were taken from patient medical records at Dr. Soetomo General Academic Hospital between 2018 and 2020.

Result: The study examined 144 cases of maxillary fractures at Dr. Soetomo General Academic Hospital, analyzing medical records and surgery reports from 2018 to 2020. Most of the patients (92.36%) were adult males (78.47%) aged between 18 and 64. The most common type of maxillary fracture observed was Le Fort 3 (47.22%), while other Le Fort classes accounted for fewer cases. The preferred treatment method was ORIF mini plating (81.25%), and the average hospital stay was around 12.56 days. Only one patient experienced post-treatment malocclusion in the 144 cases. In terms of complications, there were minimal instances of infections and exposed plates, with a total of four cases reported.

Conclusion: The treatment outcomes at Dr. Soetomo General Academic Hospital showed lower incidence rates of post-surgical issues like malocclusion, infections, and exposed plates when compared to other current datasets.

Highlights:

1. Maxillary fractures predominantly affected adult males aged between 18 and 64, comprising 92.36% of the cases studied.
2. The most common type of maxillary fracture observed was Le Fort 3, followed by other Le Fort classes.
3. The preferred treatment method for maxillary fractures was ORIF mini plating, which resulted in favorable outcomes with minimal complications.

INTRODUCTION

The viscerocranium receives structural support from the maxilla, which also adds to the aesthetics of the face. The maxilla is fundamental to the midfacial unit's function and appearance due to its critical position. Serious repercussions from damage or deformities to the maxilla might include issues with swallowing, orbital function, speech, and self-image[1].

The primary objective of managing maxillary fractures is to maintain both functionality and aesthetic appearance. The choice of treatment depends on various factors such as the severity of the injury, fracture location, presence of other injuries, and the condition of the airway. The main treatment options include conservative approaches for minor or non-displaced fractures without significant cosmetic or functional issues, reduction without fixation for slightly displaced fractures, and reduction with a fixation for extensively displaced or fragmented fractures[2].

As urban populations grow and lifestyles change due to industrial development, there has been an increase in maxillofacial injuries. Among these injuries, maxillary fractures are highly prevalent, second only to mandibular fractures in terms of incidence rate. Motor vehicular accidents are often the leading cause of maxillary fractures, with males being the primary demographic affected[3,4,5].

Surabaya, an urban city in Indonesia, experiences a high number of vehicles due to rapid motorization, resulting in an increased incidence rate of motor vehicular accidents[6]. These accidents contribute significantly to the occurrence of maxillofacial injuries in the region. With the rising number of maxillofacial injuries in Surabaya, there is an urgent need for accurate and effective treatment options. Dr. Soetomo General Academic Hospital, as the primary healthcare provider in East Java, handles the majority of maxillary fracture cases, addressing the growing demand for treatment in the area.

The purpose of this study is to analyze the medical records of maxillary fractures at Dr. Soetomo General Academic Hospital. This analysis will offer insights into the various treatment methods employed and their respective outcomes. By examining this data, a comprehensive overview of the patient's conditions during maxillary fracture treatment can be obtained. Additionally, the findings may contribute to future research in this field.

METHODS

This retrospective study focuses on analyzing the management and treatment of maxillary fractures at Dr. Soetomo General Academic Hospital using medical records from 2018 to 2020. The study examines various variables including patient demographics (age and gender), maxillary fracture types, types of treatment, and treatment outcomes. Age of the patient was classified into age groups which consists of infants (<1 year old), children (1-11 years old), teenagers (12-17 years old), adults (18-64 years old), and the elderly (>65 years old). Gender is categorized as male and female. Maxillary fracture sites are categorized based on the Le Fort classification system, such as Le Fort 1, Le Fort 2, Le Fort 3, and Le Fort combinations (Le Fort 1 + Le Fort 2, Le Fort 1 + Le Fort 3, Le Fort 2 + Le Fort 3, Le Fort 1 + Le Fort 2 + Le Fort 3). Treatment types include conservative approaches and various operative methods. Types of treatment correlate to the type of management deployed towards the patient to treat their corresponding maxillary fractures, were classified into conservative treatment and operative (ORIF mini plating, ORIF mini plating + arch bar, ORIF mini plating + interdental wiring, ORIF mini plating + arch

bar + interdental wiring). Treatment outcomes are evaluated based on the average length of stay, malocclusion, infections, and exposed plates.

RESULTS

The study included a total of 144 patients with maxillary fractures from the year 2018 to 2020. The average hospital stay for patients diagnosed with a maxillary fracture at Dr. Soetomo General Academic Hospital was found to be 12.56 days. The results of data extraction are as follows:

Table 1. The patient's age classification

Age Group	n	%
Infants	0	0%
Children	2	1.39%
Teenagers	8	5.56%
Adults	133	92.36%
Elderly	1	0.69%

Table 1 shows that adults within the age range of 18 - 64 have the most cases of maxillary fracture in Dr. Soetomo General Academic Hospital, 133 out of 144 cases are adults (92.36%). Epidemiologically, adults within the age range of 18 - 24 are the most prone to suffer from maxillofacial trauma, further supported by other studies from various regions.

Table 2. The patient's gender classification

Gender	n	%
Male	113	78.47%
Female	31	21.53%

Table 2 shows that there is a higher proportion of male patients (78.47%) compared to female patients (21.53%) in the given population (144 patients).

Table 3. The Maxillary Fracture Site Classification

Le Fort Classification	n	%
Le Fort 1	52	36.11%
Le Fort 2	15	10.42%
Le Fort 3	68	47.22%
Le Fort 1 + Le Fort 2	6	4.17%
Le Fort 1 + Le Fort 3	1	0.69%
Le Fort 2 + Le Fort 3	1	0.69%
Le Fort 1 + Le Fort 2 + Le Fort 3	1	0.69%

Table 3 shows the classification of maxillary fractures according to the Le Fort classification system. The majority of maxillary fractures in the given population are classified as Le Fort 3 (47.22%), followed by Le Fort 1 (36.11%) and Le Fort 2 (10.42%). There are also a few cases where combinations of Le Fort types are observed, but they represent a smaller proportion of the total fractures.

Table 4. The Treatment Type Classification

Operation Technique	n	%
ORIF mini plating	117	81.25%
ORIF mini plating + archbar	16	11.11%
ORIF mini plating + interdental wiring	1	0.69%
ORIF mini plating + arch bar + interdental wiring	10	6.94%

The higher maxillary fracture treatments in the given population involved the use of the ORIF mini plating technique (81.25%). There were also cases where a combination of techniques was used, such as ORIF mini plating + arch bar (11.11%) and

ORIF mini plating + arch bar + interdental wiring (6.94%). A very small proportion of treatments involved ORIF mini plating + interdental wiring (0.69%).

Table 5. The Malocclusion and Infections and Exposed Plates Classification

	Malocclusion		**Infections and Exposed Plates**	
	n	**%**	**n**	**%**
Present	1	0.69%	4	2.78%
Absent	143	99.31%	140	97.22%

The majority of cases with maxillary fractures did not include malocclusion (99.31%), infections, or exposed plates (97.22%). These problems were only seen in a small number of cases (0.69% for malocclusion and 2.78% for infections and exposed plates).

Table 6 appears to be showing the distribution of maxillary fracture sites in infants (<1 year old) categorized by different Le Fort classifications. There are no recorded cases of maxillary fractures in infants (< 1 year old) across all the Le Fort classifications (LF 1, LF 2, LF 3, combinations). the distribution of age-maxillary fracture sites in children, categorized into different age groups. In the age group of children (1-11 years old), all cases of maxillary fractures occurred at LF 3, with no fractures observed at LF 1 or LF 2. There were no cases where fractures occurred at multiple fracture sites simultaneously in this age group. It is worth noting that the sample size seems to be very small, with only two cases recorded for this analysis.

Table 6. Age-Maxillary Fracture Site

Age Group	**LF 1 (n (%))**	**LF 2 (n (%))**	**LF 3 (n (%))**	**LF 1 + LF 2 (n (%))**	**LF 1 + LF 3 (n (%))**	**LF 2 + LF 3 (n (%))**	**LF 1 + LF 2 + LF 3 (n (%))**
Infants (< 1-year-old)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Children (1-11 years old)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Teenagers (12-17 years old)	3 (37.50%)	2 (25.00 %)	2 (25.00%)	1 (12.50%)	0 (0%)	0 (0%)	0 (0%)
Adults (18-64 years old)	48 (36.09%)	13 (9.77%)	64 (48.12%)	5 (3.76%)	1 (0.75%)	1 (0.75%)	1 (0.75%)
Elderly (>65 years old)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 6, The distribution of maxillary fractures among teenagers aged 12-17 years old. The most common fracture site is LF 1, followed by LF 2 and LF 3. There is also one case where both LF 1 and LF 2 fractures are present. Among the adults (18-64 years old), maxillary fractures are most commonly observed at LF 3, followed by LF 1. There are also a few cases of fractures involving combinations of LF 1, LF 2, and LF 3. In the elderly (>65 years old) group, LF 1 is the only observed fracture site. The majority of maxillary fractures were observed in adults, with LF 3 being the most common fracture site. Teenagers also experienced a significant number of maxillary fractures, predominantly at LF 1. Among the elderly, LF 1 was the only observed fracture site.

Table 7. Gender-Maxillary Fracture Site

Gender	LF 1 (n (%))	LF 2 (n (%))	LF 3 (n (%))	LF 1 + LF 2 (n (%))	LF 1 + LF 3 (n (%))	LF 2 + LF 3 (n (%))	LF 1 + LF 2 + LF 3 (n (%))
Male	38 (33.62%)	11 (9.73%)	55 (48.67%)	6 (5.31%)	1 (0.88%)	1 (0.88%)	1 (0.88%)
Female	14 (45.16%)	4 (12.90%)	13 (41.94%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 8. Types of Treatment-Maxillary Fracture Site

Operation Technique	LF 1 (n(%))	LF 2 (n (%))	LF 3 (n (%))	LF 1 + LF 2 (n (%))	LF 1 + LF 3 (n (%))	LF 2 + LF 3 (n (%))	LF 1 + LF 2 + LF 3 (n (%))
ORIF mini plating	45 (38.46 %)	11 (9.40%)	55 (47.01%)	4 (3.42%)	1 (0.85%)	0 (0%)	1 (0.85%)
ORIF mini plating + arch bar	4 (25.00 %)	1 (6.25%)	8 (50.00%)	2 (12.50%)	0 (0%)	1 (6.25%)	0 (0%)
ORIF mini plating + interdental wiring	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
ORIF miniplating + arch bar + interdental wiring	3 (30.00 %)	3 (30.00%)	4 (40.00%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 9. Malocclusion and Infections and Exposed Plates-Maxillary Fracture Site

Present	LF 1 (n (%))	LF 2 (n (%))	LF 3 (n (%))	LF 1 + LF 2 (n (%))	LF 1 + LF 3 (n (%))	LF 2 + LF 3 (n (%))	LF 1 + LF 2 + LF 3 (n (%))
Malocclusion	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Infections and Exposed Plates	4 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 7 shows the number and percentage of maxillary fracture sites for males and females. It indicates that the most common fracture site for males is LF 3 (48.67%), followed by LF 1 (33.62%), and LF 2 (9.73%). In contrast, for females, LF 1 is the most common site (45.16%), followed by LF 3 (41.94%), and LF 2 (12.90%). There are no reported cases of combined fracture sites (LF 1, LF 2, LF 3, LF 1 + LF 2, LF 1 + LF 3, LF 2 + LF 3, LF 1 + LF 2+ LF 3) for females.

Table 8 provides information on the types of treatment used for different maxillary fracture sites. The table shows the number and percentage of different treatment techniques for each maxillary fracture site. The most common treatment across all fracture sites is ORIF mini plating. For specific fracture sites, LF 3 has the highest number of cases treated with ORIF mini plating, followed by LF 1. LF 2 has the lowest number of cases overall. The combined use of treatment techniques is less common, with only a few cases reported.

For various maxillary fracture sites, table 9 gives information on the presence of malocclusion, infections, and exposed plates. The table shows the number and percentage of cases with malocclusion and infections/exposed plates for each maxillary fracture site. Only LF 1 has reported cases of malocclusion, with one case (100%). However, no cases of malocclusion are reported for the other fracture sites or their combinations. Similarly, LF 1 has reported cases of infections and exposed plates, with four cases (100%). There are no reported cases of infections or exposed plates for the other fracture sites or their combinations.

DISCUSSIONS

This study found that the majority of maxillary fracture cases at Dr. Soetomo General Academic Hospital were among adults aged 18 to 64, accounting for 133 out of 144 cases (92.36%)(Table 1). This aligns with epidemiological trends indicating that young adults, particularly those in the age range of 18 to 24, are more susceptible to maxillofacial trauma. This observation is consistent with findings from previous studies conducted in Brazil (2006), Taiwan (2017), and Australia (2013)[6,7,8], which also reported higher incidences of maxillofacial fractures in similar age groups.

The higher prevalence of maxillary fractures among adults aged 18 to 64 may be linked to the frequency of vehicular accidents in the region, as this age range corresponds to the demographic of drivers in Indonesia. Surabaya, the urban city where Dr. Soetomo General Academic Hospital is situated, has been experiencing a gradual increase in the number of vehicles due to rapid motorization among its citizens[9]. The rise in motorization in

Surabaya has resulted in an increased incidence rate of motor vehicular accidents, making it a leading cause of maxillofacial trauma. Similar findings have been reported in other parts of Indonesia, such as Bali, where a 2020 study highlighted that motor vehicle accidents (MVA) were the primary cause of maxillofacial injuries[5]. International studies have also revealed that vehicular accidents contribute significantly to the prevalence of maxillofacial fractures in other countries. For example, in Brazil, traffic accidents account for the majority (45%) of maxillofacial injuries, highlighting the impact of vehicular accidents as a leading cause of such injuries worldwide[3]. In Taiwan, road traffic accidents (RTA) have been identified as the leading cause of maxillofacial injuries, as reported in a study[7]. Similarly, in Australia, motor vehicular accidents (MVA) contribute to a significant portion (23.88%) of the overall cause of maxillofacial injuries. These findings emphasize the consistent pattern of vehicular accidents playing a prominent role in maxillofacial trauma across different countries[8].

Adults with an age range of 18 to 64 are also included in the productive age range, in which work-related injuries that occur could additionally contribute towards the high percentage of maxillofacial injuries.

All 2 of the children within the range of 1 to 11 years old in this study are diagnosed with Le Fort 3 fractures (100%). The high percentage of Le Fort 3 fractures in children may be attributed to the skull structure of children and infants, in which the ratio of the cranium to the midface is larger than in skulls of older age groups, leading to a higher chance of impact points that may lead to complete separation of the cranium and the midface (Table 6).

Le Fort 1 cases are the majority for teenagers in the age range of 12 to 17 years old with 3 out of the 6 in the range (37.50%). Adults within the age range of 18 to 64, being the prime age for working and the majority of vehicle users, have the most cases of maxillary fracture, most of them from the Le Fort 3 classification (64 out of 133 (48.12%)). A single case of the elderly age group is a Le Fort 1 diagnosis (100%) (Table 6).

This study shows that males have a significantly higher number of cases compared to females. 113 out of 144 cases were male (78.47%) and 31 out of 144 cases were female (21.53%) (Table 2). Male cases being the majority in maxillary fractures is consistent throughout the years. Multiple studies from 1980 until 2014 show that males are a constant majority in maxillary fracture cases[10].

Males suffer most maxillary fracture cases, with most being a Le Fort 3 type classification, 55 out of 113 cases from this study being a Le Fort 3 fracture (48.67%). Females, however, have Le Fort 1 fractures as a majority (14 out of 31 (45.16%)), although Le Fort 3 is a close second with 13 cases (41.94%) (Table 7).

Among 144 cases of maxillary fracture at Dr. Soetomo General Academic Hospital, 52 out of 144 cases were diagnosed as Le Fort 1 (36.11%), 15 were Le Fort 2 (10.42%), 68 were Le Fort 3 (47.22%), 6 were Le Fort 1 + Le Fort 2 (4.17%), 1 was Le Fort 1 + Le Fort 3 (0.69%), 1 was Le Fort 2 + Le Fort 3 (0.69%), and 1 was Le Fort 1 + Le Fort 2 + Le Fort 3 (0.69%) (Table 3).

Le Fort 3 being the most common fracture site for maxillary fractures aligns with other studies, in which Le Fort 3 fractures appear to also be a majority (2065 out of 6989 (30%)) from a total of 15 different studies[10].

In all cases of maxillary fracture gathered from medical records at Dr. Soetomo General Academic Hospital from 2018 until 2020, an operative approach for treatment is deployed. ORIF mini plating is also a primary

staple on treatment for all the cases, what varies upon the treatment are the additions of arch bar installation and interdental wiring. 117 cases out of 144 were treated with ORIF mini plating (81.25%), 16 out of 144 with ORIF mini plating + arch bar (11.11%), 1 out of 144 with ORIF mini plating + interdental wiring (0.69%), and 10 out of 144 with ORIF mini plating + arch bar + interdental wiring (6.94%) (Table 4).

Treatments in this study consist of all operational approaches. ORIF mini plating is deployed in most of the surgeries, most often on Le Fort 3 cases, 55 out of 117 of the maxillary fracture cases treated with ORIF mini plating (47.01%). ORIF mini plating with arch bar installation is most often deployed in Le Fort 3 (8 out of 16 (50%)). A single case of ORIF mini plating with interdental wiring surgical operation is for a Le Fort 3 fracture (100%).4 out of the 9 cases of maxillary fractures being treated with ORIF mini plating an arch bar installation, and interdental wiring are deployed for treating Le Fort 3 fractures (40%) (Table 8)

Patients diagnosed with maxillary fractures in Dr. Soetomo General Academic Hospital from 2018 until 2020 have an average length of stay of 12.56 days, which starts from admission to completion of treatment, compared with other studies with an average of 9 days[10].

The presence of post-treatment malocclusion in Dr. Soetomo General Academic Hospital during 2018 until 2020 is low, data from the medical records show only 1 out of 144 maxillary fracture cases have malocclusion present (0.69%). Compared to other similar studies, malocclusion rates for Dr. Soetomo General Academic Hospital are lower (2.80%)(9) (Table 5). A single case of malocclusion present out of all the cases in this study is from a case of Le Fort 1 fracture (100%) (Table 9).

The presence of post-treatment infections and exposed plates in Dr. Soetomo General Academic Hospital from 2018 until 2020 is 4 cases out of 144 (2.78%). Comparison with other studies yields data such as infected metalware (3.20%), and plate exposure (1.60%) (Cabalag et al., 2014) (Table 5). All 4 incidents of infections and exposed plates occurred in cases of Le Fort 1 fractures (100%) (Table 9).

This study collected patient profiles from Dr. Soetomo General Academic Hospital who underwent treatment for maxillary fractures. The study focused on variables such as age, gender, maxillary fracture sites, types of treatment, and treatment outcomes.

The data provided is from a single hospital (Dr. Soetomo General Academic Hospital) during a specific period (2018-2020). This limits the generalizability of the findings and may not reflect the overall population or different healthcare settings. The data is limited to a relatively short time frame of three years. A longer duration of data collection could provide a more comprehensive understanding of the patterns and trends in maxillary fractures. The sample size of 144 cases may be considered relatively small, which might limit the statistical power and precision of the findings. A larger sample size could strengthen the reliability and validity of the study. The characteristics and demographics of the patients in this hospital might not be representative of the wider population. The statement mentions that the outcomes of treatment in Dr. Soetomo General Academic Hospital have relatively lower incidence rates of complications compared to other existing datasets. However, specific comparative datasets or studies are not provided, making it difficult to assess the significance of the findings.

CONCLUSION

A study conducted at Dr. Soetomo General Academic Hospital from 2018 to 2020 examined 144 cases of maxillary fractures. The majority of patients were adult males (78.47%) between the ages of 18 and 64 (92.36%). The most common type of fracture observed was Le Fort 3 (47.22%), with other Le Fort classifications being less frequent. Treatment primarily involved ORIF mini plating (81.25%), with an average hospital stay of 12.56 days. Post-treatment complications such as malocclusion, infections, and exposed plates were rare, occurring in only a small number of cases. These findings suggest favorable treatment outcomes compared to other datasets and provide valuable data for future research. Overall, outcomes of treatment in Dr. Soetomo General Academic Hospital result in relatively lower incidence rates of post-surgical complications such as malocclusion, infected, and exposed plates compared to other existing datasets.

ACKNOWLEDGMENTS

The authors thank the Department of Anatomy, Histology, and Pharmacology, and Department of Plastic Reconstructive and Aesthetic Surgery, Faculty of Medicine, Universitas Airlangga Surabaya, Indonesia, Musculoskeletal Consultant of Indonesian Musculoskeletal Radiologist Society (IMRS), Surabaya, and also Australian Craniofacial Unit, Adelaide, South Australia, Australia for their encouragement to share their support in this study.

CONFLICT OF INTEREST

None.

FUNDING DISCLOSURE

None.

AUTHOR CONTRIBUTION

IDGS the study and approved the final draft. RS drafted the manuscript. ASB and MRSH critically revised the manuscript for important intellectual content. All authors facilitated all project-related tasks and read and approved the final draft.

REFERENCES

1. Dalgorf D & Higgins K. Reconstruction of the Midface and Palate. *Semin Plast Surg* 2020; 34: 77–85.
2. Peretti N & MacLeod S. Zygomaticomaxillary complex fractures: Diagnosis and treatment. *Curr Opin Otolaryngol Head Neck Surg* 2017; 25: 314–319.
3. Samieirad S, Aboutorabzade MR, Tohidi E, Shaban B, Khalife H, & Hashemipour MA et al. Maxillofacial fracture epidemiology and treatment plans in the Northeast of Iran: A retrospective study. *Med Oral Patol Oral Cir Bucal* 2017; 22: e616–624.
4. Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 86: 31–5.
5. Riasa NP, Parama A, Budiapsari PI & LD. The pattern of facial injury among foreign travelers in Bali: A retrospective study. *Maced J Med Sci* 2020; 8: 988–993.
6. Brasileiro BF & Passeri LA. Epidemiological analysis of maxillofacial fractures in Brazil: A 5-year prospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2022; 102: 28–34.
7. Yang CS, Chen SCC, Yang YC, Huang LC, Guo HR &Yang H. Epidemiology and patterns of facial fractures due to road traffic accidents in Taiwan: A 15-year retrospective study. *Traffic Inj Prev* 2017; 18: 724–729.
8. Cabalag MS, Wasiak J, Andrew NE, Tang J, Kirby JC & MD. Epidemiology and

management of maxillofacial fractures in an Australian trauma center. *J Plast Reconstr Aesthetic Surg* 2014; 67: 183–189.
9. Soehodho S. Motorization in Indonesia and Its Impact On Traffic Accidents. *IATSS Res* 2007; 31: 27–33.
10. Phillips BJ & Turco LM. Le Fort Fractures: A Collective Review. *Bull Emerg Trauma* 2017; 5: 221–230.

JURNAL
REKONSTRUKSI DAN ESTETIK

META-ANALYSIS: SQUAMOUS CELL CARCINOMA CASES ARISING FROM MORBUS HANSEN IN DR. SITANALA CENTRAL HOSPITAL (2011-2021)

Francisca Victoria*, Sweety Pribadi

Department of Plastic Reconstructive and Aesthetic Surgery, Dr. Sitanala Central Hospital, Tanggerang, Indonesia

ARTICLE INFO

Keywords: Carcinoma, leprosy, Morbus Hansen, infectious disease, squamous cell carcinoma, quality of life

***Corresponding author*:**
Francisca Victoria
Email address:
franciscavictoria96@gmail.com

***History*:**
Received: June 28, 2023
Revised: May 12, 2023
Accepted: May 23, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2301-7937
DOI: 10.20473/jre.v8i1.37048
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Victoria F & Pribadi S. META-ANALYSIS: SQUAMOUS CELL CARCINOMA CASES ARISING FROM MORBUS HANSEN IN DR. SITANALA CENTRAL HOSPITAL (2011-2021). Jurnal Rekonstruksi dan Estetik.2023; 8(1): 39-46.

ABSTRACT

Introduction: Leprosy, a chronic systemic infection caused by Mycobacterium Leprae, has been associated with the development of cutaneous neoplasms, such as squamous cell carcinoma. This study aimed to examine the characteristics of patients diagnosed with squamous cell carcinoma arising from Morbus Hansen (leprosy).

Methods: A retrospective analysis of medical records from Dr. Sitanala Central Hospital was conducted, focusing on patients diagnosed with squamous cell carcinoma arising from Morbus Hansen over 10 years from 2011 to 2021. Descriptive analysis was performed on the collected data.

Result: In this study, out of the twenty-one patients, the majority were male (86%), and the most common age group affected was between 46 and 55 years, accounting for 43% of the cases. Most patients had Morbus Hansen type BL (borderline lepromatous) and had been living with the condition for an average of 23 years. Additionally, a significant number of patients had a normal body mass index (52%) within the range of 20-24.9. Anemia was the main comorbidity observed, affecting 46% of the patients.

Conclusion: Examining the clinical profile of these patients helps healthcare providers identify specific characteristics associated with this condition, further research with more comprehensive data is necessary to ensure accuracy. Future studies could also explore potential connections between hypertension, anemia, and squamous cell carcinoma arising from Morbus Hansen.

Highlights:

1. The majority of SCC cases were observed in males (86%), emphasizing a higher susceptibility of males to this form of cancer compared to females (14%).
2. The study identified an increased risk of SCC particularly among individuals in the 46-55 and 56-65 age groups.
3. The study revealed that a significant proportion of Morbus Hansen patients with SCC had a normal weight, while the occurrence of overweight and obesity was relatively low.
4. Maintaining a healthy body weight may play a role in reducing the risk of SCC in this patient population.

INTRODUCTION

Morbus Hansen, better known as leprosy, Leprosy is a chronic infectious disease caused by the bacteria Mycobacterium leprae. It primarily affects the skin and peripheral nerves, leading to various symptoms such as neuropathy, deformities, and, in severe cases, auto-amputation of digits[1,2]. In cases where auto-amputation does not occur, chronic skin injuries can develop, which increases the risk of complications such as the development of squamous cell carcinoma (SCC). SCC is a type of skin cancer that arises from the squamous cells in the outer layer of the skin. The chronic skin injuries associated with leprosy can create an environment conducive to the development of SCC[3,4].

It is a chronic granulomatous infection that is endemic in some developing countries. In 2015, the global prevalence of leprosy was reported to be 210,758 cases[5]. The World Health Organization (WHO) data for 2019 suggests that a total of 202,185 new cases were detected globally. Brazil, India, and Indonesia topped the list with more than 10,000 cases each[6]. The majority of these cases were found in the Southeast Asian region, with 156,118 patients, followed by the Americas region with 28,806 patients, and Africa with 20,004 patients[1]. Indonesia is the third country with the highest incidence of leprosy with 15,910 people diagnosed in 2017. The top two countries with the highest number of new cases were India and Brazil[7, 1,5]. This disease has been known as far back as 3000 years ago.

The prevalence of leprosy in Indonesia in 2017 was reported to be 0.70 cases per 10,000 population. Additionally, the number of new cases found was 6.07 cases per year for every 100,000 individuals. In ten provinces of Indonesia, the prevalence of leprosy was still higher than 1 case per 10,000 population. These cases were spread across approximately 7,548 villages, covering a working area of around 1,975 health centers in 341 regencies/cities throughout Indonesia[1,5].

Neurological damage of patients with leprosy contributes to the frequent incidence of lesions, especially on the hands and feet, with the manifestation of skin dryness, fissures, and ulcerations, also secondary infection in the bone and soft tissues, not rarely causing deformities[8]. Malignant development may be associated with chronicity, continuous trauma, neglect of skincare, or osteomyelitis. SCC has been described as a complication of chronic, usually plantar, ulcers in leprosy patients[9]. Individuals with leprosy need to receive appropriate medical care and management to prevent complications and minimize the risk of developing SCC or other associated complications. Early diagnosis and treatment of leprosy are crucial in preventing long-term damage and minimizing the risk of these complications[3]. The objective of this descriptive study is to describe the clinical profile of patients developing squamous cell carcinoma arising from Morbus Hansen in Dr. Sitanala central hospital years 2011-2021.

METHODS

The purpose of this study is to identify the traits of Morbus Hansen-caused SCC patients at Dr. Sitanala Central Leprosy Hospital between 2011 and 2021. Therefore, this study will be carried out utilizing the descriptive retrospective design research method through observation and examination of the patient's medical records. Describing a phenomenon and its traits is the aim of descriptive study[10,11].

All Morbus Hansen-related squamous cell carcinoma patients treated at Dr. Sitanala Central Hospital between 2011 and 2021 comprised the study's population. The study population that the chosen research sample

belonged to—patients with Morbus Hansen developing SCC—met the inclusion criteria. The content analysis method was used to collect samples, which involves gathering information by reading and studying data from documents (in this case, medical records), which is then compiled and arranged to display the patient's clinical profiles and produce reliable conclusions[10].

Variables used in this research were the medical state of the patients which includes age, gender, body mass index, Morbus Hansen type infection, duration of disease, and comorbid diseases. Variable data from the research was then analyzed with the descriptive method, the data gathered will then be presented in a table format.

Through systematic grouping, each variable was categorized. The age of the patients was divided into 9 groupings 6, as indicated in Table 2. Underweight, normal, overweight, and obese (class I, II, and III) BMI categories were used[12]. According to the Ridley-Jopling classification of leprosy, there are four different types of leprosy: lepromatous-leprosy (LL), borderline-lepromatous (BL), and borderline-tuberculoid (TT)[13].

Patients' data were accessed after approval was granted by the hospital and the researcher vows to keep patients' identities confidential. Results from this research will only be used for the advancement of medical sciences and not for any other purposes.

RESULTS

A total of 21 cases of SCC arising from Morbus Hansen patients were seen during the 10 years. Of the 21 patients, 18 (86 %) were males and 3 (14%) were females (Table 1). The average age (male and female) at the time of diagnosis was 54 years (ranging from 26 to 70 years), and 43% were between the age of 46- 55 years (Table 2).

Table 1. Patients' gender classification of SCC arising from Morbus Hansen patients

Gender		
Classification	Male	Female
Amount	18	3
Percentage	86%	14%

Table 2. Patient's Age classification of SCC arising from Morbus Hansen patients

Age		
Classification	Amount	Percentage
<5	0	0%
5-11	0	0%
12-16	0	0%
17-25	0	0%
26-35	1	5%
36-45	2	10%
46-55	9	43%
56-65	7	32%
>65	2	10%

Of all patients, 11 (52%) have normal Body Mass Index, followed by underweight (33%) and overweight (10%). Only 1 patient was found obese in class I, and none in the second and third classes (Table 3). Though most (62%) of the Morbus Hansen type was not recorded, the distribution of the leprosy classification (Ridley-Jopling) was as follows (Table 4): borderline-tuberculoid (BT): 3 (14 %); borderline lepromatous (BL): 4 (19%) and lepromatous (LL): 1 (5%). Due to the long duration of the disease, some patients have incomplete records of their first diagnosis of morbus hansen. From the ones that have their data recorded, the average duration of leprosy at the time of diagnosis was 23 years, ranging from 4 to 30 years (Table 5). Most patients have no comorbid recorded, but the main comorbid found were hypertension (36%), also anemia (28%), diabetes (21%), and tuberculosis (14%)(Table 6).

Table 3. Patients' Body Mass Index classification of SCC arising from Morbus Hansen patients

Body Mass Index		
Classification	Amount	Percentage
Underweight (15-19.9)	7	33%
Normal (20 – 24.9)	11	52%
Overweight (25 – 29.9)	2	10%
Class I Obese (30 –34.9)	1	5%
Class II Obese (35-39.9)	0	0%
Class III Obese (>40)	0	10%

Table 4. Morbus Hansen type

Morbus Hansen Type		
Classification	Amount	Percentage
TT	0	0%
BT	3	14%
BB	0	0%
BL	4	19%
LL	1	5%
unknown	13	62%

Table 5. Patients' Disease Duration of SCC arising from Morbus Hansen patients

Duration						
Year	4	12	27	28	29	30
Amount	1	1	1	1	2	1
Average	23 years					

Table 6. Comorbid SCC arising from Morbus Hansen patients

Comorbid		
Classification	Amount	Percentage
Diabetes	3	21%
Anemia	4	28%
Hypertension	5	36%
Tuberculosis	2	14%

DISCUSSIONS

Table 1 provides the gender classification of squamous cell carcinoma (SCC) cases that have arisen from patients with Morbus Hansen (leprosy). The table presents the number of cases for each gender category. There were 18 cases among males and 3 cases among females. The corresponding percentages indicate that males accounted for 86% of the SCC cases, while females accounted for 14%.

Table 2 presents the age classification of SCC cases among Morbus Hansen patients. The table categorizes the cases based on different age groups. The numbers represent the cases found within each age group. There were no cases reported in the age groups "<5" and "5-11". The first case was reported in the "26-35" age group, with a total of 1 case. The number of cases increased in subsequent age groups, with 2 cases in "36-45", 9 cases in "46-55", 7 cases in "56-65", and 2 cases in ">65". The percentages show the distribution of cases within each age group.

Table 3 provided data presents the classification of Body Mass Index (BMI) with corresponding amounts and percentages. Among the individuals studied, 33% were classified as underweight (BMI 15-19.9), 52% fell within the normal weight range (BMI 20-24.9), 10% were classified as overweight (BMI 25-29.9), and 5% were classified as Class I obese (BMI 30-34.9). There were no reported cases in the Class II

Obese (BMI 35-39.9) category, while 10% of the cases were categorized as Class III Obese (BMI >40). This data provides insights into the distribution of BMI categories within the studied population, highlighting the prevalence of normal weight and the relatively low occurrence of overweight and obese classifications.

The data suggest that SCC arising from Morbus Hansen is more common in males compared to females. Additionally, it appears that the risk of developing SCC increases with age, particularly in the 46-55 and 56-65 age ranges.

The Ridley-Jopling criteria is a classification system commonly used by researchers in leprosy studies[14]. This classification is based on the examination of lymphocyte and macrophage populations in skin lesions and defines a spectrum of five different types of leprosy. The spectrum includes polar forms, such as tuberculoid (TT) and lepromatous (LL) leprosy, as well as borderline forms, including borderline tuberculoid (BT), borderline lepromatous (BL), and borderline-borderline (BB) leprosy (Figure 1)[15].

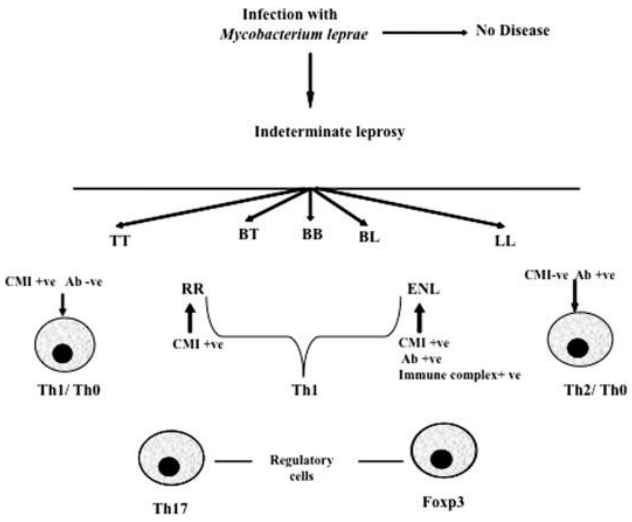


Figure 1. Immunological features of the leprosy spectrum (Ridley Jopling Classification)[15].

Figure 1 shows the immunological features of the leprosy spectrum based on the Ridley-Jopling Classification. The different types of leprosy along the spectrum are represented, including polar tuberculoid (TT), borderline tuberculoid (BT), borderline (BB), borderline lepromatous (BL), and polar lepromatous (LL) leprosy. The figure also shows the occurrence of leprosy reactions and their relationship to bacillary load. Type 1 or Reversal reactions (RR) and Type 2 or erythema nodosum leprosum reactions (ENL) are indicated. These reactions can occur during leprosy and lead to inflammatory responses.

The immunological features depicted include different T helper cell subsets. Th1 represents T helper 1 cells, Th2 represents T helper 2 cells, Th0 represents T helper 0 cells, and Th17 represents T helper cells producing interleukin 17 (IL-17). The figure also includes Foxp3, which represents T cells with the nuclear forkhead box 3 transcription factor. These different cell types play a role in the immune response and can have varying effects on leprosy progression and the development of reactions. Additionally, the figure indicates T cell-mediated immunity (CMI) and the presence of antibodies (Ab) in leprosy. These immune factors are important in understanding the immune response to Mycobacterium leprae, the bacterium that causes leprosy.

Although a significant portion (62%) of the Morbus Hansen type (a term used for leprosy) was not recorded, the distribution of leprosy classifications based on the Ridley-Jopling criteria was as follows: borderline tuberculoid (BT) accounted for 14% (3 cases), borderline lepromatous (BL) accounted for 19% (4 cases), and lepromatous (LL) accounted for 5% (1 case). These percentages represent the recorded cases within the study or dataset being referenced. It's important to note that the unrecorded cases may have

varied classifications and could impact the overall distribution if known (Table 4).

One of the useful aspects of this classification is that it recognizes that the polar forms of leprosy (TT and LL) are clinically stable, meaning they tend to progress slowly and have less tendency to develop complications. On the other hand, the borderline forms (BT, BL, and BB) have a higher propensity to develop reactions, which are inflammatory episodes that can cause significant damage to tissues and nerves. By understanding the different forms of leprosy along this spectrum, researchers can better assess the severity of the disease and predict the likelihood of reactions or complications. This classification system helps in guiding appropriate treatment strategies and monitoring the progression of the disease in affected individuals.

Table 5 provides information on the disease duration of squamous cell carcinoma (SCC) arising from Morbus Hansen (leprosy) patients. The table shows the number of cases within specific duration ranges, ranging from 4 to 30 years. There was one case each for the durations of 4, 12, 27, 28, and 30 years, and two cases for 29 years. The average disease duration for SCC arising from Morbus Hansen patients was calculated to be 23 years.

Table 6 presents the comorbidities associated with SCC arising from Morbus Hansen patients. The table includes the comorbid classifications, the number of cases reported for each comorbidity, and the corresponding percentages. Among the comorbidities observed, diabetes accounted for 21% (3 cases), anemia for 28% (4 cases), hypertension for 36% (5 cases), and tuberculosis for 14% (2 cases). These findings indicate the presence of various comorbid conditions in patients with SCC arising from Morbus Hansen, with hypertension being the most prevalent comorbidity reported.

The data study provides a comprehensive overview of various aspects related to squamous cell carcinoma (SCC) arising from Morbus Hansen (leprosy) patients, including gender classification, age distribution, body mass index (BMI) classification, leprosy spectrum classification, disease duration, and comorbidities. While the data might be limited in its generalizability as it specifically pertains to SCC cases arising from Morbus Hansen patients and may not be representative of the general population or other populations with SCC.

Overall, while the data provides valuable insights into various aspects of SCC arising from Morbus Hansen patients, it is important to consider these limitations when interpreting and applying the findings. Further research with larger sample sizes and more comprehensive data collection would enhance the validity and generalizability of the results.

CONCLUSION

This study investigated squamous cell carcinoma (SCC) in patients with Morbus Hansen (leprosy) and made important findings. They found that SCC cases were more common in males (86%) compared to females (14%). The study also revealed that the risk of SCC increased with age, particularly in the 46-55 and 56-65 age groups. The study found that a significant proportion of patients had a normal weight, while the occurrence of overweight and obesity was relatively low.

Additionally, the study used the Ridley-Jopling classification system to categorize different types of leprosy, providing insights into disease severity, prediction of complications, and treatment strategies. The study also explored the duration of SCC in Morbus Hansen patients, with an average disease duration of 23 years. Comorbidity analysis identified various associated

conditions, with hypertension being the most prevalent comorbidity.

ACKNOWLEDGMENTS

The authors thank the Department of Plastic Reconstructive and Aesthetic Surgery, Dr. Sitanala Central Hospital, Tanggerang, Indonesia for their support in this study.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study.

FUNDING DISCLOSURE

None.

AUTHOR CONTRIBUTION

The study was designed and approved by FV. The manuscript was initially drafted by SP and later revised by FV and SP for important intellectual content. Furthermore, all authors carefully reviewed and approved the final version of the manuscript.

REFERENCES

1. Kementerian Kesehatan Republik Indonesia. *Hapuskan Stigma dan Diskriminasi terhadap Kusta*. 2018.
2. Kementerian Kesehatan Republik Indonesia. *profil kesehatan indonesia 2019 - Penelusuran Google*, https://www.google.com/search?q=profil+kesehatan+indonesia+2019&oq=profil+kesehatan+indo&aqs=chrome.0.69i59l2j69i57j0i512l2j69i60l3.10073j0j7&sourceid=chrome&ie=UTF-8 (2020).
3. Tsamara FR, Brigitta SR, Setiawan A. and SS. Limb amputation in squamous cell carcinoma patient with a history of leprosy. *Sci Midwifery* 2023; 10: 4837–4844.
4. Seretis A, Cividini S, Markozannes G, et al. Association between blood pressure and risk of cancer development: a systematic review and meta-analysis of observational studies. *Sci Rep*; 9. Epub ahead of print 2019. DOI: 10.1038/s41598-019-45014-4.
5. Hannan M, Notobroto HB, Hargono R, et al. effect of health worker support and self-efficacy on self-care agency of lepers in Indonesia. *Int J Health Sci (Qassim)* 2022; 6: 1240–1248.
6. WHO. *Global leprosy (Hansen disease) update, 2019: time to step-up prevention initiatives. Weekly epidemiological record*, https://www.who.int/publications/i/item/who-wer9536 (2020).
7. WHO. *Global Leprosy update, 2017: reducing the disease burden due to leprosy', The Weekly Epidemiological Record (WER)*. Wkly Epidemiol Rec, https://www.who.int/publications-detail-redirect/who-wer9536 (2018).
8. Lastória JC, de Abreu MAMM. Leprosy: Review of the epidemiological, clinical, and etiopathogenic aspects - Part 1. *An Bras Dermatol* 2014; 89: 205–218.
9. Smith RJ&. Squamous cell carcinoma in plantar ulcers in leprosy. A case-control study. *Lepr Rev* 1993; 64: 270–274.
10. Nassaji H. Qualitative and descriptive research: Data type versus data analysis. *Lang Teach Res* 2015; 19: 129–132.
11. Aggarwal R, Ranganathan P. Study designs: Part 2 - Descriptive studies. *Perspect Clin Res* 2019; 10: 34–36.
12. Nuttall FQ. Body mass index: Obesity, BMI, and health: A critical review. *Nutr Today* 2015; 50: 117–128.
13. RIDLEY DS, JOPLING WH. A classification of leprosy for research purposes. *Lepr Rev* 1962; 33: 119–128.
14. Ridley DS JW. Classification of leprosy according to immunity. A five-group system. *Int J Lepr Other Mycobact Dis* 1966; 34: 255–273.

15. Nath I, Saini C & VV. Immunology of leprosy and diagnostic challenges. *Clin Dermatol* 2015; 33: 90–98.

JURNAL
REKONSTRUKSI DAN ESTETIK

SYSTEMATIC REVIEW: ANAPLASTIC LARGE CELL LYMPHOMA FOLLOWING BREAST IMPLANT SURGERY

Kezia Eveline*, Rizqi Shabrina Lestari, Lavonia Berlina Adzalika

Department of Plastic Surgery, Reconstructive, and Aesthetic, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

ARTICLE INFO

Keywords: Anaplastic large cell lymphoma, BIA-ALCL, breast implant, health risk

***Corresponding author*:**
Kezia Eveline
Email address:
keziafb96@gmail.com

***History*:**
Received: March 8, 2023
Revised: May 19, 2023
Accepted: May 27, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2684-9453
DOI: 10.20473/jre.v8i1.31215
Open access :

Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Eveline K, Lestari RS & Adzalika LB. SYSTEMATIC REVIEW: ANAPLASTIC LARGE CELL LYMPHOMA FOLLOWING BREAST IMPLANT SURGERY. Jurnal Rekonstruksi dan Estetik.2023; 8(1): 47-58.

ABSTRACT

Introduction: BIA-ALCL, a T-cell lymphoma associated with breast implants, poses a growing medical challenge despite its relatively low occurrence, due to the increasing use of implants for cosmetic and reconstructive purposes. Our objective is to review the incidence, characteristics of patients, implant types, management, and outcome of BIA-ALCL.

Methods: Pubmed and Science Direct databases were searched to identify case series and observational research. A systematic review was conducted by looking up the keywords "breast implant" and "anaplastic large cell lymphoma".

Results: 11 relevant articles were assessed. A total of 353 BIA-ALCL cases have been reported. The mean age at diagnosis was 59.6 years. More than half (53.26%) of the reasons for the breast implants in BIA-ALCL patients were cosmetic. The mean time from breast implant placement to diagnosis was 9.99 years. The majority (71.39%) of documented BIA-ALCL cases have been associated with textured devices. BIA-ALCL patients mainly presented with seroma (54.67%). Outcomes included remission (71%), death because of the disease (4.25%), and recurrence (3.96%) with a mean time of duration of follow-up was 2.53 years.

Conclusion: BIA-ALCL is rare cancer in some patients with breast implants but is increasing in incidence largely due to consistent and long-term follow-up. It is important for physicians involved in the care of patients with breast implants to be aware of BIA-ALCL and do routine breast exams.

Highlights:

1. BIA-ALCL, a T-cell lymphoma associated with breast implants, is posing a growing medical challenge due to the increasing use of implants for cosmetic and reconstructive purposes.
2. The majority of BIA-ALCL cases were associated with cosmetic reasons for breast implants, and textured implants were predominantly implicated.

INTRODUCTION

Breast implantation is a common surgical procedure for breast augmentation or reconstruction of the breast following a mastectomy. The first pair of silicone gel-filled implants were inserted in 1962. Breast implants, like any other implanted foreign body, come with risks. The first documented case of BIA-ALCL was discovered in 1997 by

Keech and Creech when they observed an association between BIA-ALCL and a saline-filled breast implant. Since then, there has been an expanding awareness of this substance[1]. Implants can be categorized into saline-filled, silicone-filled, or mixed, with smooth or textured[2]. The Food and Drug Administration (FDA) announced in 2011 that there could be a connection between breast implants and the development of ALCL. In March 2018, the FDA stated BIA-ALCL is an uncommon but highly treatable disease, emphasizing textured implants as the cause of most cases[3]. The prognosis for BIA-ALCL is excellent, with a low risk of death compared to other malignancies[4]. Because this disease can be treated and has a good prognosis, early detection is important.

ALCL itself is a rare disease with only 2 percent of all newly diagnosed non-Hodgkin lymphomas worldwide[5]. Primary lymphoma of the breast takes up 0.4 to 0.5 percent of all breast malignancies and approximately 1 to 2 percent of all extra-nodal lymphomas, almost all of them of less aggressive B-cell origin[6]. Although BIA-ALCL develops around breast implants, BIA-ALCL is not considered breast cancer but a malignancy of the immune system. BIA-ALCL is a CD30-positive, anaplastic lymphoma kinase-negative T-cell lymphoma. BIA-ALCL is found mostly in the scar tissue and fluid around the implant, although it can spread systemically in some cases[7].

Despite the infrequency of this disease, there has been a growing number of case series and case reports published. Our study aims to systematically review the incidence, implant characteristics, clinical presentations, treatments, and outcomes of this disease.

METHODS

Data searching strategy

This systematic review was done according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement and Cochrane Handbook for Systematic Reviews of Interventions (S1 Table)[8,9]. We searched PubMed and Science Direct databases to identify all cases of BIA-ALCL reported since 10 years ago. The search start date was March 10, 2021, to March 17, 2021. We used the following keywords: "(((Anaplastic large cell lymphoma [MeSH Terms])) AND ((Breast implant [MeSH Terms])) OR (Breast Implant surgery [MeSH Terms]))".

Eligibility criteria

Search results were categorized as research (epidemiologic studies or scientific articles) and non-research (case reports or case series) articles from peer-reviewed journals, reviews, letters to the editor, conference abstracts, and unpublished manuscripts. Only human-based topics and articles written in English were considered. The inclusion criteria were observational study design and case series, full-text in English, and study in the last 10 years. The exclusion criteria were case report/ systematic review/ meta-analysis.

Data extraction and quality assessment

Criteria for including a case required that at least some additional information other than diagnosis was available (e.g., history, symptoms, follow-up). Data elements abstracted included information about patient demographics, medical history, implant characteristics, presenting symptoms, diagnosis and staging, treatment, and patient outcomes. Detailed summary tables were

created, which contained frequencies, means, and ranges for each abstracted variable, as applicable. To minimize the risk of bias, quality assessment of eligible studies was performed through Newcastle-Ottawa Scale (NOS) for observational study[10].

RESULTS

Literature Search

In total, 592 titles were returned by the literature search. Of these, 11 articles were selected for review presenting 353 new cases of BIA-ALCL. Three (27.2 percent) were case series and eight (72.73 percent) were observational studies. (Figure 1).

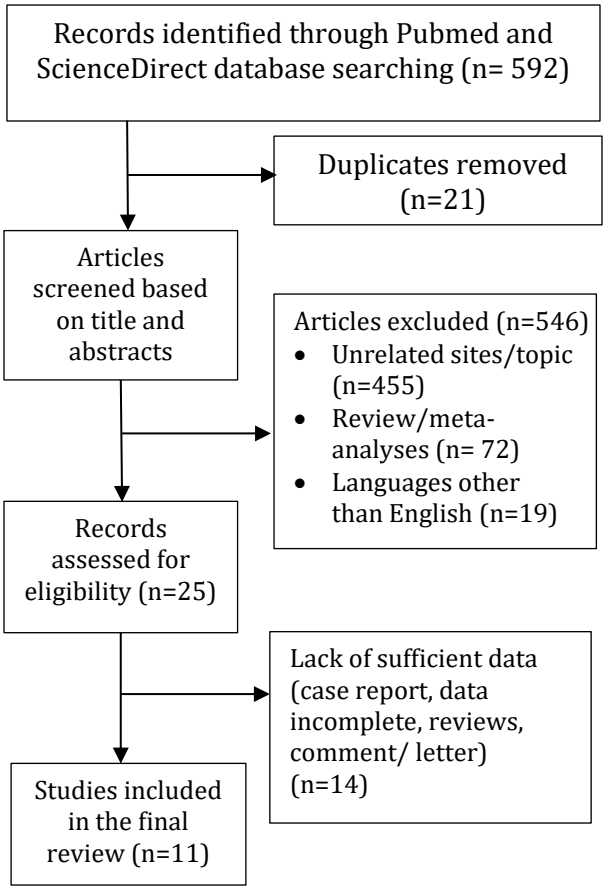


Figure 1. Literature flow of published BIA-ALCL articles

Table 1. Summary of Studied Included in Final Review

Study (risk of bias assessment)	Country (Year)	Design	BIA-ALCL cases
Cordeiro et al.[11] (NOS score: 7/9)	New York, USA (2020)	Prospective Cohort	10
Collins et al.[12] (NOS score: 8/9)	Texas, USA (2019)	Retrospective	39
Lamaris et al.[13] (NOS score: 9/9)	Toronto, Canada (2019)	Retrospective	18
Doren et al.[14] (NOS score: 8/9)	Texas, USA (2017)	Retrospective	100
Dashevsky et al.[15] (NOS score: 7/9)	New York, USA (2018)	Cohort	11
Nelson et al.[16] (NOS score: 9/9)	New York, USA (2020)	Cohort	11
Campanale et al.[17] (NOS score: 9/9)	Rome, Italia (2020)	Case series	46
Loch-Wilkinson et al.[18] (NOS score: 9/9)	Australia (2017)	Cohort	55
Johnson et al.[19] (NOS score: 8/9)	United Kingdom (2017)	Case series	18
Aladily et al.[20] (NOS score: 8/9)	Texas, USA (2012)	Case series	13
De Boer et al.[21] (NOS score: 9/9)	Amsterdam, Netherland (2018)	Case-control	32

*NOS: Newcastle-Ottawa Scale

Patient Characteristics

Characteristics of the patients, information on their medical history, and data on their implant types are summarized in Table 2. In our systematic review, the estimated mean age at BIA-ALCL diagnosis was 59.6 (range 28 to 87) years. Of 353 women who developed BIA-ALCL, 188 (53.26 percent) underwent the original implant surgery for cosmetic augmentation, and 161 (45.61 percent) for reconstruction after cancer surgery or prophylaxis of breast cancer. Seven (1.98 percent) patients reported no data. 188 (53.26 percent) patients had a history of cancer.

Implant Characteristics

Data were not consistently reported on the placement of the implant or the size, surface, and implant covering. Almost all of the cases had no data about implant placement (i.e., sub glandular, subpectoral, or submuscular). Of the 261 cases with available data, 251 (96.1 percent) of the implants were reported to have a textured surface. The implant covering was also rarely reported. Of the 20 (5.66 percent) that were reported, ten reported a silicone covering, and ten reported a polyurethane foam covering. The type of implants used among the BIA-ALCL cases was saline in 30 (8.5 percent) and silicone in 133 (37.39 percent) (26.1 percent did not report implant type). Two hundred-one of the 353 BIA-ALCL cases (56.04 percent) had data about the implant manufacturer/model. Of these 201, 95 (26.91 percent of 54) reported Allergan, one (2 percent) reported Allergan/Inamed/McGhan, 8 (2.27 percent) reported Nagor, 14 (3.97 percent) reported Silimed, five (1.42percent) reported Mentor, 47 (13.31 percent) reported Salt Loss, four (1.13 percent) reported PIP, five (1.42 percent) reported Negative Imprint, and one (0.28 percent) reported Surgitek. Of note, not all manufacturers labeled their implants in the past; thus, when not reported, it is unknown whether this was simply not reported by choice or not reported because the implant was not labeled.

Table 2. Characteristics of BIA-ALCL Cases

	Total (%)*
No.	353
Age at diagnosis, yr	
Mean	59.6
Range	29-87
Affected breast	
Unilateral	
Left	34 (9.63)
Right	32 (9.06)
Unknown	74 (20.96)
Bilateral	77 (21.81)
Not reported	136 (38.53)
Reason for initial implant	
Cosmetic	188 (53.26)
Reconstruction	161 (45.61)
Not reported	7 (1.98)
History of cancer	
Yes	202 (57.22)
No	151 (42.78)
Times between implant and BIA-ALCL diagnostic (yr)	
Mean	9.99
Range	0.2-27
Surface	
Smooth	10 (2.83)
Textured	251 (71.39)
Not reported	92 (26.1)
Covering	
Silicone	10 (2.83)
Polyurethane	10 (2.83)
Not reported	312 (88.39)
Type of implant filling	

Silicone	132 (37.39)
Saline	30 (8.50)
Both	2 (0.57)
Not reported	189 (53.54)
Manufacturer/ model	
Allergan/Inamed/McGhan	95 (26.91)
Nagor	8 (2.27)
Silimed	14 (3.97)
Mentor Silicone	5 (1.42)
Salt Loss	47 (13.31)
Poly Implant Prothese	4 (1.13)
Negative Imprint	5 (1.42)
Surgitek	1 (0.28)
Not reported	152 (43.06)

Case Presentation

More than half (193; 54.67 percent) of 353 patients reported having seroma/ effusion around the implant. Fifty-eight of 353 BIA-ALCL cases (16.43 percent) reported data indicating that the patient had a palpable breast mass on presentation (Table 3). Sizes of the mass were not reported. The presence of lymph node involvement was addressed in 27 (7.6 percent) patients. Duration of symptoms was rarely noted.

Diagnosis and Staging of the Disease

The mean time to diagnosis was 9.99 (range, 0.2 to 27 years). By the *National Comprehensive Cancer Network* Consensus Guidelines for Breast Diagnosis and Management of BIA-ALCL, at the time of diagnosis, 51 patients (14.44 percent) were in stage IA, 1 (0.28 percent) were in stage IB, three (0.85percent) were in stage IC, 17 (4.82 percent) were in stage IIA, three (0.85 percent) were in stage IIB; eleven cases (3.12 percent) was in stage III; seven (1.09 percent) were in stage IV; and nine cases (2.25 percent) were not reported. Non-Hodgkin lymphoma is traditionally staged utilizing the Lugano modification of the Ann Arbor staging system. Stage IE disease is limited to a single extranodal (E) site such as the breast or implant capsule, whereas stage IIE disease is defined as an extranodal disease with spread to or involvement of local lymph nodes. 29 cases (8.22 percent) were in stage IE and 21 cases (6.23 percent) were in stage IIE.

Table 3. Clinical Course of Patients with BIA-ALCL

	Value (%)
Total subject	353
Seroma	
Yes	193 (54.67)
No	60 (16.98)
Not reported	100 (28.39)
Mass	
Yes	58 (16.43)
No	195 (55.24)
Not reported	100 (28.39)
A lymph node investigation performed	
Yes	27 (7.6)
No	226 (64.02)
Not reported	100 (28.39)
Stage (Ann Arbor)	
IE	29 (8.22)
IIE	21 (6.23)
IV	1 (0.28)
Not reported	302 (85.56)
Stage (TNM)	
IA	51 (14.44)
IB	1 (0.28)
IC	3 (0.85)
IIA	17 (4.82)
IIB	3 (0.85)
III	11 (3.12)
IV	7 (1.09)
Not Reported	9 (2.55)

TNM, tumor, node, metastasis. Staging IA = T1N0M0; IB=T2N0M0; IC= T3N0M0; IIA= T4N0M0; IIB=T1=3N1M0; III= T4N1-2M0; IV= TanyNanyM1

Surgical Treatments and Adjuvant Therapies

The affected implant was reported as removed in 253 of the 353 reported cases of BIA-ALCL (71.67 percent) (Table 3). The remaining 100 cases (28.39 percent) provided no data regarding removal. Of the 353 cases, 110 (31.16 percent) were reported to have surgical removal of the contralateral implants. In no cases were the implants reported to be left in place on the affected side. However, most reports (58.36 percent) gave no information about the status of the contralateral implant.

Of all of the 353 cases, 89 (25.21 percent) received chemotherapy, although information about chemotherapy was not reported for 28.3 percent of the cases. 175 (49.58 percent) received no chemotherapy. When chemotherapy regimens were reported, the regimens were noted to consist mostly of cyclophosphamide, hydroxydaunorubicin, vincristine, and prednisone (plus/minus other chemotherapeutic agents). Six cases (1.7 percent) received neoadjuvant chemotherapy. Thirty-nine (11.05 percent) received radiation therapy, not report the location of radiation in either the chest wall or axillary or other places. 194 (54.96 percent) did not receive radiation therapy. Information on radiation therapy was not reported for 100 (28.33 percent). Twelve cases (3.4 percent) received a stem cell transplant for treatment of their BIA-ALCL.

Table 4. Treatment of Patients with BIA-ALCL

	Value (%)
Surgical removal of the affected implant	
Yes	253 (71.67)
No	0
Not reported	100 (28.39)
Radiation therapy	
Yes	39 (11.05)
No	194 (54.96)
Not reported	100 (28.33)
Chemotherapy/other	
Yes	89 (25.21)
Neoadjuvant	6 (1.70)
Adjuvant	
CHOP	19 (5.38)
CHOEP	4 (1.13)
CHOEP+DHAP/DX/BRX	5 (1.14)
Not reported	55 (15.58)
No	175 (49.58)
Not reported	100 (28.33)
Stem cell transplant	
Yes	12 (3.4)
No	241 (68.37)
Not reported	100 (28.33)
Clinical follow-up reported	
Yes	216 (61.19)
No	137 (38.81)
Duration of follow-up (years)	
Mean	2,53
Range	0.1-12
Outcome	
DOD	15 (4.25)
DOUD	7 (1.98)
CR	86 (24.36)
Recurrence	14 (3.96)
Not reported	231(5.44)

CHOP, cyclophosphamide, hydroxydaunorubicin, vincristine, and prednisone; ESHAP, etoposide, methylprednisolone, cytarabine, and cisplatin; ICE, ifosfamide, carboplatin, and etoposide; ABVD, Adriamycin, bleomycin, vinblastine, and dacarbazine. DOD: Death of the disease, DOUD: Death of the unrelated disease, CR: Complete remission

*Totals may not sum to 100% because of rounding.

Outcome

Some sort of clinical follow-up was reported for 216 cases (61.19 percent), although the frequency of follow-up was never reported. When reported, the mean duration of follow-up was 2.53 years (range, 0.1 to 12 years). Of the 216 cases with follow-up data, 86 (24.36) had complete remission, 14 (3.96 percent) had a recurrence, 15 (4.25

percent) died as a result of the disease, 7 (1.98 percent) died as a result of underlying disease, 7 (1.98) and 231 (65.44 percent) did not have information regarding follow up.

DISCUSSIONS

BIA-ALCL is a rare type of lymphoma that was initially described in 1997[1]. The FDA has received more than 300 records of BIA-ALCL (medical device reports of BIA-ALCL), Our systematic review identified 353 cases of BIA-ALCL occurring in women with breast implants. The chance to develop BIA-ALCL among patients with breast implants is low and, according to a study in the Netherlands, the incidence is 1 in 500,000 women who have received breast implants[22]. Breast implants are used by 5 to 10 million women worldwide, and the rates of breast augmentation and implant-based breast reconstruction are rising every year. Eighty-three percent of breast reconstructions in the United States in 2010 were implant-based[23].

A rise in the number of BIA-ALCL cases diagnosed was expected. In our study, above half of the patients had cosmetic reasons for their initial implant. This is significant because cosmetic patients frequently do not follow up with their plastic surgeon after 1 post-operative year, although this paradigm is changing among some practitioners. Patients with breast cancer commonly see their breast surgeon or medical oncologist for follow-up far after the first year of the reconstruction surgery. Furthermore, if a woman is seen at the emergency department or by a general practitioner with breast problems, she is often first referred to a general surgeon or breast surgeon even if she has breast implants. Since these practitioners may be unaware of the diagnosis of BIA-ALCL due to a lack of clear symptoms, there is a risk of delay or misdiagnosis. They may be unfamiliar with the immunochemistry stains that must be requested, as well as the type of implant used. Most of the literature that was previously published has been in plastic surgery journals; therefore, it is needed to spread the information about this diagnosis to other medical and surgical specialties that have a higher chance to come into contact with these patients first. Many patients are also unaware of this condition [24].

In our study, a majority (71.39%) of the BIA-ALCL cases had textured surface implants. Although the textured implant surface adheres to the fibrous capsule naturally produced by the body, which helps to maintain implant position and location; on the contrary, smooth implants are more mobile. A hypothesis suggested that the texture of the implants was related to a greater number of cases, those that were more aggressively texturized and had a denser biofilm, in which the predisposed patients would be more likely to develop inflammatory and lymphoma formations. In a study by Loch-Wilkinson et al reviewing the cases of BIA-ALCL in Australia and New Zealand, the authors noted that higher surface area textured implants significantly increase the risk for the development of BIA-ALCL.[18] Prior work by Hu et al found that textured implants retain up to 72 times more bacteria on the implant surface compared to smooth implants due to their increased surface area[25-26]. Hu et al also discovered that textured, rather than smooth breast implants, elicited a stronger immune response with a higher proportion of T cell lymphocytes, rather than B cells. This T cell hyperplasia likely devolves into BIA-ALCL, a T cell lymphoma subtype. As there are likely many other contributory factors, further research is needed to determine whether there is a causal relationship between implant type and BIA-ALCL. The anaplastic gigantic cell lymphoma in breast implants is associated with a chronic immune response, which is primarily consisting of lymphocyte cells, T CD4 and CD30. There is the possibility that

the trigger is bacteria, a super-antigen from staphylococcus, which triggers CD4 cell proliferation in the lymphoma cutaneous, specifically lymphoma CD30. Interestingly, the ALCL associated with implants is very similar to cutaneous benign lymphoma[27]. A load of bacteria increases the biofilm over the texturized structures, particularly in the most aggressive textures or macro-textures. Deva discovered that bacteria in the biofilm interface showed a possible connection between the number of bacteria and the number of lymphocytes. In some studies, there was a rise in the dimension of the biofilm, and the bacteria found has been negatively compared to the capsular contracture that was positive. Any chronic inflammatory process can trigger a lymphoproliferative disorder with a potential relationship with lymphoma[28].

More than half (54%) of BIA-ALCL in our study had a fluid collection arising in the peri-implant fibrous capsule (seroma). There were just a few patients who had a mass. Inflammatory cells confined to the peri-implant capsule, according to Laurent et al, may represent an in-situ disease, while those with an associated mass may have a more advanced form, with infiltration of adjacent tissues beyond the capsule[29]. The majority of patients who present with an effusion around the implant but no tumor mass achieve full remission and have a good prognosis. Patients with a tumor mass associated with the fibrous capsule make up a smaller group of patients that are more likely to have clinically aggressive disease. We suggest that patients without a tumor may benefit from conservative treatment, perhaps implant removal with capsulectomy alone, and patients with a tumor mass may require implant removal as well as systemic therapy, which is still being identified[30].

From the available guidelines that we found, one of the most used is *National Comprehensive Cancer Network (*NCCN). They recommend implant removal, complete capsulectomies, and excision of suspicious lymph nodes. They also recommend the removal of the contralateral breast implant, and our study found that 110 patients out of 253 patients that received surgical removal also had the contralateral implant surgically removed. In our study, the most used adjuvant therapy was chemotherapy (which is 25.21%). However, we found no specific trial in the guidelines to guide the management of patients with advanced BIA-ALCL. But we found that radiotherapy is suggested for patients with local residual disease, positive margins, or unresectable disease with chest wall invasion. While systemic therapy, such as chemotherapy, is suggested for patients with Lugano / Ann Arbor stage II-IV or MDA TNM stage IIB-IV disease and de-novo ALK-negative systemic ALCL[31].

We identified only a small number (4.52%) of deaths of the disease, but obtaining more detailed information on such patients, and ensuring long-term follow-up for all BIA-ALCL patients, would allow for more effective identification of at-risk patients. It is extremely important to understand risk factors that cause death (e.g., stage at presentation, history of lymphoma, or lymphoma-like conditions), even though BIA-ALCL is thought to have a benign course in general. This allows clinicians to raise suspicion for aggressive disease early on and may suggest the need for very close follow-up, systemic chemotherapy, and/ or radiation therapy[31].

We note that there are still very few cases of BIA-ALCL reported in the literature, which makes the identification of risk factors for optimal management of BIA-ALCL difficult. The case reports rarely report the information of complete diagnostic or clinical presentation. Sometimes, these data are not available to reporting clinicians, such as when

the patient is lost to follow-up or changes their care to another provider. Given that case reports and case series are often written by clinicians with varying backgrounds, and thus differing areas of interest, perhaps a better approach to gather systematic information on this entity would be to start a disease registry. We recommend that manufacturers and regulators collaborate if possible to share data about cases of BIA-ALCL and/or implant registries. This would enable the collection of a larger number of cases and eliminate the possibility of duplicate cases being reported in different registries[24].

In all chronic seromas related to breast implants, the presence and possibility of BIA-ALCL diagnosis should be taken into account. It is advisable to take an immunohistochemistry test and seek assistance from a pathologist who is familiar with the diagnosis of lymphoma. There is no universal treatment. Treatment of this disease involves a multidisciplinary team. It must be evaluated by bilateral surgical removal of the capsule with the removal of the implants. New treatments such as Brentuximab can be helpful in advanced cases [32].

There are still few review studies that focus on BIA-ALCL. Therefore, this review gives the newest review of BIA-ALCL. However, this study also has limitations. The data consisted of clinical case series/retrospective studies that were not homogeneous, which did not enable a statistical analysis to be performed to determine the potential associations.

CONCLUSION

BIA-ALCL case is higher in patients with textured surfaces. The most common clinical course is seroma. We identified only a small number of deaths of the disease, but obtaining detailed information and ensuring long-term follow-up will give us the best result. It is important for physicians involved in the care of patients with breast implants to be aware of BIA-ALCL and for the breast implant patient to do routine breast exams.

ACKNOWLEDGMENTS

The authors thank the Department of Plastic Surgery, Reconstructive, and Aesthetic, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia for their support in this study.

CONFLICT OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

FUNDING DISCLOSURE

No funding disclosure statement was provided for this study.

AUTHOR CONTRIBUTION

KE reviewed all relevant references to identify articles containing case information, data extraction, and analysis, and wrote the manuscript. For each identified case, two clinicians were reviewed by LBA and RSL. BSN was study design, supervised the research process, and reviewed and edited the manuscript. independently recorded all available case-based data and then compared and reconciled their data.

REFERENCES

1. Keech, J.A., Jr.; Creech, B.J. Anaplastic T-cell lymphoma in proximity to a saline-filled breast implant. Plast. Reconstr. Surg. 1997; 100:554–555.
2. M. Co, T.H. Chan, *et al.* Breast Implant-associated Anaplastic Large Cell Lymphoma - a Systematic Review with

Pooled Analysis. Clinical Oncology 32 .2020. 639e646
3. Brody G, Deapen D, Taylor C, Pinter-Brown L, House-Light- ner SR, Andersen J, et al. Anaplastic large cell lymphoma occurring in women with breast implants: analysis of 173 cases. *Plast Reconstr Surg* 2015; 135 (3):695e705.
4. Deva, A.K., Turner, S.D., et al. Etiology of Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL): Current Directions in Research. Cancers. 2020; 12: 3861.
5. Armitage JO, Weisenburger DD. A new approach to classifying non-Hodgkin's lymphomas: Clinical features of the major histologic subtypes. Non-Hodgkin's Lymphoma Classification Project. *J Clin Oncol*. 1998;16:2780–2795.
6. Jeanneret-Sozzi W, Taghian A, Epelbaum R, et al. Primary breast lymphoma: The patient profile, outcome, and prognostic factors. A multicentre Rare Cancer Network study. *BMC Cancer* .2008;8:86.
7. Kim, B., Carol Roth, R.N., *et al.* Anaplastic Large Cell Lymphoma and Breast Implants: A Systematic Review. American Society of Plastic Surgeons. 2011
8. Higgins J, Green S. Cochrane Handbook for systematic reviews of in-interventions | Cochrane training. Cochrane Collab 2021 [Online]. Available: 6.2; 2021. https://training.cochrane.org/handbook /current.
9. Liberati A, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. BMJ Jul. 2009;339.
10. Wells G, Shea B, O'Connell D. The Newcastle-Ottawa scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses. Ottawa Hosp Research Inst 2013 [Accessed March 18th, 2021]. Available: http://www.ohri.ca/programs/clinical epidemiology/oxford.asp.
11. Cordeiro P, Ghione P, Ni A, Hu Q, Ganesan N, Galasso N et al. Risk of breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) in a cohort of 3546 women prospectively followed long term after sssimplants. Journal of Plastic, Reconstructive & Aesthetic Surgery. 2020;73(5):841-846.
12. Collins M, Miranda R, Medeiros L, Silva de Meneses M, Iyer S, Butler C, et al. Characteristics and Treatment of Advanced Breast Implant–Associated Anaplastic Large Cell Lymphoma. Plastic and Reconstructive Surgery. 2019;143:41S-50S.
13. Lamaris G, Butler C, Deva A, Miranda R, Hunt K, Connell T, et al. Breast Reconstruction Following Breast Implant–Associated Anaplastic Large Cell Lymphoma. Plastic and Reconstructive Surgery. 2019;143:51S-58S.
14. Doren E, Miranda R, Selber J, Garvey P, Liu J, Medeiros L, et al. U.S. Epidemiology of Breast Implant–Associated Anaplastic Large Cell Lymphoma. Plastic and Reconstructive Surgery. 2017;139(5):1042-1050.
15. Dashevsky B, Gallagher K, Grabenstetter A, Cordeiro P, Dogan A, Morris E, et al. Breast implant-associated anaplastic large cell lymphoma: Clinical and imaging findings at a large US cancer center. The Breast Journal. 2019;25(1):69-74.
16. Nelson J, Dabic S, Mehrara B, Cordeiro P, Disa J, Pusic A et al. Breast Implant-associated Anaplastic Large Cell Lymphoma Incidence. Annals of Surgery. 2020;272(3):403-409.
17. Campanale A, Spagnoli A, Lispi L, Boldrini R, Marletta M. The Crucial Role of Surgical Treatment in BIA-ALCL Prognosis in Early- and Advanced-Stage Patients.

Plastic & Reconstructive Surgery. 2020;146(5):530e-538e.
18. Loch-Wilkinson A, Beath K, Knight R, Wessels W, Magnusson M, Papadopoulos T, et al. Breast Implant–Associated Anaplastic Large Cell Lymphoma in Australia and New Zealand: high-surface-area textured implants are associated with increased risk. Plastic and Reconstructive Surgery. 2017;140(4):645-654.
19. Johnson L, O'Donoghue J, McLean N, Turton P, Khan A, Turner S, et al. Breast implant-associated anaplastic large cell lymphoma: The UK experience. Recommendations on its management and implications for informed consent. European Journal of Surgical Oncology (EJSO). 2017;43(8):1393-1401.
20. Aladily T, Medeiros L, Amin M, Haideri N, Ye D, Azevedo S et al. Anaplastic Large Cell Lymphoma Associated With Breast Implants. American Journal of Surgical Pathology. 2012;36(7):1000-1008.
21. De Boer M, van Leeuwen F, Hauptmann M, Overbeek L, de Boer J, Hijmering N et al. Breast Implants and the Risk of Anaplastic Large-Cell Lymphoma in the Breast. JAMA Oncology. 2018;4(3):335.
22. Zarbo RJ, Nakhleh RE: Surgical pathology specimens for gross examination only and exempt from submission: A College of American Pathologists Q-Probes study of current policies in 413 institutions. Arch Pathol Lab Med 123:133-139, 1999
23. Gurunluoglu R et al. Current trends in breast reconstruction: a survey of American Society of Plastic Surgeons 2010. *Ann Plast Surg*. 2013;70(1): 103-110.
24. Leberfinger AN, Behar BJ, Williams NC, Rakszawski KL, Potochny JD, Mackay DR, Ravnic DJ. Breast Implant-Associated Anaplastic Large Cell Lymphoma: A Systematic Review. JAMA Surg. 2017 Dec 1;152(12):1161-1168. doi: 10.1001/jamasurg.2017.4026. PMID: 29049466.
25. Hu H, Jacombs A, Vickery K, Merten SL, Pennington DG, Deva AK. Chronic biofilm infection in breast implants is associated with an increased T-cell lymphocytic infiltrate: implications for breast implant-associated lymphoma. *Plast Reconstr Surg*. 2015;135(2):319- 329
26. Hu H, Johani K, Almatroudi A, et al. Bacterial biofilm infection detected in breast implant-associated anaplastic large-cell lymphoma. *Plast Reconstr Surg*. 2016;137(6):1659-1669.
27. Mulligan Ch, Salisbury E, Tschuchnigg M, et al. ALK1- Negative anaplastic large cell lymphoma of the breast from a nonprosthesis. *Cyst* 2014 PRS Global Open: 1-3
28. Honghua H, Jacombs A, Vickery K, et al. Chronic biofilm infection in breast implants is associated with an in-creased T-cell lymphocytic infiltrate: implications for breast implant-associated lymphoma. *Plastic Reconst Surg* 2015;135(2):319–329
29. Laurent C, Delas A, Gaulard P, et al. Breast implant-associated anaplastic large cell lymphoma: two distinct clinicopathological variants with different outcomes. *Ann Oncol*. 2016;27(2):306-314.
30. Clemens MW, Jacobsen ED, Horwitz SM. 2019 NCCN consensus guidelines on the diagnosis and treatment of breast implant-associated anaplastic large cell lymphoma (BIA-ALCL). Aesthet Surg J 2019;39(Supplement_1):S3–S13
31. Leberfinger AN, Behar BJ, Williams NC, Rakszawski KL, Potochny JD, Mackay DR, Ravnic DJ. Breast Implant-Associated Anaplastic Large Cell Lymphoma: A Systematic Review. JAMA Surg. 2017 Dec 1;152(12):1161-1168. doi:

10.1001/jamasurg.2017.4026. PMID: 29049466.

32. Ferreri A, Govi S, Pileri SA, et al. Anaplastic large cell lymphoma, ALK-negative. *Crit Rev Oncol/Haematol* 2013;85:206–2015.

GUIDELINE FOR AUTHORS

Jurnal Rekonstruksi dan Estetik (JRE) (p-ISSN:2301-7937, e-ISSN: 2774-6062) is a scientific peer-reviewed medical journal that is relevant to plastic reconstruction, aesthetic surgery, and other health-related professions. Jurnal Rekonstruksi dan Estetik (JRE) is indexed by EBSCO, Google Scholar, GARUDA, WorldCat, CrossRef, BASE, and Dimensions.

Jurnal Rekonstruksi dan Estetik is published twice a year, every June and December by the Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. Jurnal Rekonstruksi dan Estetik (JRE) publishes articles in the original article, case report, systematic review, literature review, and meta-analysis with a focus on burn and wound, hand surgery, microsurgery, oncoplastic, craniofacial and external genitalia reconstruction, and aesthetics.

All authors must follow the Guidelines for Authors, Author Declarations, Publication Ethics, and Patient concerns for publication. The manuscript should be written according to our Document Template. The manuscript has not been published elsewhere and is only considered in Jurnal Rekonstruksi dan Estetik (JRE). The statement sheet established by the International Committee of Medical Journal Editors (ICMJE) must be accepted by all authors who contributed to the publication. Authors are requested to have ORCID ID upon submission in Jurnal Rekonstruksi dan Estetik (JRE). You will be guided step-by-step through the creation and upload of your files as the submission process for this publication is entirely online. The manuscript is submitted directly to https://e-journal.unair.ac.id/JRE/about/submissions

The selection of papers for publishing is based on their scientific excellence quality, original research, unique contribution to knowledge, and importance to contemporary plastic reconstruction and aesthetic surgery. After receiving suggestions from peer reviewers, the Editorial Board decides if an article is feasible. It is the author's obligation to revise the manuscript, and any unworkable submissions will be returned to the author. If any manuscript reject, it will be automatically informed by email: jre@journal.unair.ac.id

FORMAT OF MANUSCRIPT TYPE

All manuscripts must be submitted in English. The manuscript is written in Cambria on A4 paper (21x29.7 cm). sized 12, title sized 18, authors' names sized 13, affiliations, abstract, and highlights sized 10, and keyword corresponding author, history, journal information, and How to cite sized 8. Use single-spaced in two columns. Single variables (e.g., $a^2 + b^2 = c^2$; $C_6H_{12}O_6$), other symbols (e.g., Δ or β), or mathematical operators (e.g., ≥, x, or ±) are not typed using the equation function. SI units are used. Write using italics (e.g., *Rattus norvegicus*). The citation should be arranged in accordance with the Vancouver system using Arabic numerals and superscript type

Original Article

Original Articles should report on original clinical studies or research not previously published or being considered for publication elsewhere. The text should not exceed 3500 words or no more than 30 pages excluding the Abstract and References with an abstract of a maximum of 250 words, a list of a minimum of 25 references. The Original Articles should be obtained ethical approval by Ethical Committee by sending the publication ethics letter. The structure of the Original Articles manuscript submitted to Jurnal Rekonstruksi dan Estetik (JRE) is the manuscript title, authors' name, affiliations, abstract, keywords, introduction, methods, results, discussion, conclusion, acknowledgment, conflict of interest, funding disclosure, author contribution, and references.

Case Report

Case Report should report on case clinical studies with a minimum of five case studies not previously published or being considered for publication elsewhere. The text should not exceed 3500 words excluding Abstract and References with an abstract of a maximum of 250 words, and a list of a minimum of 15 references. Case Reports should be obtained approval by patients by sending the patient's

concern for publication letter. The structure of the Case Report manuscript submitted to Jurnal Rekonstruksi dan Estetik (JRE) is the manuscript title, authors' name, affiliations, abstract, keywords, introduction, case illustration, results, discussion, conclusion, acknowledgment, conflict of interest, funding disclosure, author contribution, and references.

Systematic Review

Systematic Review are thorough evaluations of the evidence from various data sources in connection to a particular topic in the field of plastic reconstruction and aesthetic surgery. The appropriate data sources should be thoroughly searched, and the items gathered should be properly analyzed for inclusion based on previously established inclusion/exclusion criteria. The process should be described and shown analytically via a graphic. The precise characteristics of the patient or study participant groups that were included in the review should be explained, together with the measures of exposure and outcomes with a reference to the relevant data sources. The text must not exceed 3,500 with an abstract of a maximum of 250 words, no more than four tables and/or figures, and a minimum of 30 references. The appropriate methodology should be followed, such as CASP, GRADE CERQual, PRISMA, PRISMA-ScR, and PROSPERO. The structure of the Systematic Review manuscript submitted to Jurnal Rekonstruksi dan Estetik (JRE) is the manuscript title, authors' name, affiliations, abstract, keywords, introduction, methods, results, discussion, conclusion, acknowledgment, conflict of interest, funding disclosure, author contribution, and references.

Literature Review

The same rules for systematic reviews should be followed for literature reviews. They must give thorough explanations and statistical evaluations of the combined estimates of pre-determined outcomes, research heterogeneity and quality, potential publication bias, meta-regression, and subgroup analyses if necessary. Reviews contain points and detailed items based on literature that correlates with the subject covered, which will be discussed in the discussion section. The detail of the subject discussed or the elaboration of the review, not repeating the review, how the review of the reported literature can solve the problem, as well as differences and similarities with previous studies. The authors are requested to submit PRISMA flow diagrams, depending on the type of investigation.

Meta-Analysis

The same guidelines that apply to systematic reviews also apply to meta-analyses. They must give explanations and statistical evaluations of the combined estimates of pre-determined outcomes, research heterogeneity and quality, potential publication bias, meta-regression, and subgroup analyses if necessary. Depending on the type of study, the authors are invited to submit PRISMA flow diagrams or MOOSE checklists. In terms of the editorial process, both systematic reviews and meta-analyses will be treated similarly to original publications.

MANUSCRIPT STRUCTURE DESCRIPTION

The following information must be included:

Manuscript Title

The title should be specific, concise, and comprehensible. It should be written in English in sentence case and contain a maximum of 20 words. (not exceeding 80 letters and spaces) with capital letters UPPERCASE according to the Enhanced Spelling and left alignment.

Full Authors' Names

The manuscript has a main author and co-authors. Academic ranks or titles should not be used in an author's name. The ORCID ID of at least one author must be added. The link ought to be included on the ORCID ID logo after the authors' names.

Corresponding Author

Indicate the corresponding author clearly with an asterisk symbol (*) after the corresponding author's name. A corresponding author is a person who is in charge of managing correspondence with the Editorial Board during the whole pre- and post-publication of the manuscript process.

Authors' Affiliation(s)

The affiliations are listed sequentially using an alphabet ([a,b,c]) and the name of the department(s) to which the authors are affiliated (including the city and the country).

Example:

Erdo Puncak Sidarta[a]*, Syeben Hezer Epatah Hietingwati[b], Robertus Arian Datusanantyo[a]

[a]Department of Surgery, Prof. Dr. W.Z.Johannes General Hospital, Kupang, East Nusa Tenggara
[b]Department of Anatomic Pathology, Prof. Dr. W.Z. Johannes General Hospital Kupang, East Nusa Tenggara

Abstract

The manuscript should contain a structured abstract that is self-contained and citation-free. The abstract comes after the title and authorship information in the manuscript. It should be written in English of no more than 250 words. It consists of an introduction, methods, results, and conclusion, while introduction, case illustration, results, and conclusion for Case Report.

Keywords

The keywords consist of 3-5 words in English, starting with a capital letter (Sentence case) without an ending point, and must contain at least one keyword of Sustainable Development Goals (SDGs).

Correspondent Author

The correspondent author contains the details of the author data in charge with the detailed address and e-mail (consisting of full name, affiliation, address, telephone number, and email address).

Highlights

(ighlights o£ the manuscript should not be copyZpasted £rom other parts o£ the teØt and consist o£ a minimum o£ two signi£icant points that studyɔs original contributions.

Introduction

State the rationale for the study, a brief description of the background consisting of background issues, problem formulation, research objectives, and benefits. Establish a gap in the current knowledge, state the novelties, and convince the readers that the gap. The results and conclusions should not be included.

Methods

Methods contain clear descriptions of the tools and materials used and research schemes and methods useful for other researchers to replicate and check validity if necessary. Reference should be given to the method used. Studies that use animal or human subjects should include evidence of applicable ethical research.

Case Illustration

Contains a clear and detailed description of the case(s) presented, including: anamnesis and clinical examinations. The specific system of tooth nomenclature: Zygmondy, World Health Organization or Universal must be clearly stated. The operation technique is presented accurately and concisely in chronological order supported with figures and a detailed description of the research methodology employed.

Results

Results should be presented accurately and concisely in a logical order with the number of tables and illustrations needed to summarize the important results of the study. Tables must be horizontal (without vertical line separation). The mathematical equation must be written clearly. If the mathematical symbol is not available on the computer, the symbol can be handwritten with a pencil. The decimal number must be separated by a comma (,) if the article is written in Bahasa Indonesia. Tables, illustrations, and photographs should be quoted in the text in sequence and separated from the text. The title and detailed description of the illustrations (drawings, graphs) are written in the legend for illustration, not in the illustration. All non-standard abbreviations used should be described in the footnotes.

Figures

Cite figures in ascending Arabic numerals according to the first appearance in the manuscript file. The original format must be in JPEG and not be smaller than 300 dpi. Figures require a label with Arabic numerals in order (e.g., "Figure 1", "Figure 2", and so on) and a brief descriptive title to be placed below the figure, center-aligned. Do not submit your figures in separate files.

Tables

Cite tables in ascending Arabic numerals according to the first appearance in the manuscript. Tables require a label with Arabic numerals in order (e.g., "Table 1", "Table 2", and so on) and a brief descriptive title to be placed above the table. Do not submit your tables in separate files.

Example:

Table 1. Relatable Title of Table

No.	Category	n
1	Category 1	1.34
2	Category 1	24.33*
3	Category 1	2,223.11
Total		**2,248.78**

*note

Discussion

The discussion explains the meaning of the results of the study, does not repeat the results, how the reported results can solve the problems, the differences and similarities with the studies that have been done before, and the possibility of developing the study. This section should include the possibilities for developing further studies, strengths, and limitations of the study. Ensuring that the discussion corresponds to the results should often commence with a brief summary of the main scientific findings (not experimental results). The following components should be covered in the discussion:

1. How does the case/ study relate to the original question or objectives outlined in the introduction section (what/how)?
2. Is scientific interpretation provided for each example of case/study finding presented (why)?
3. Is the case/ study consistent with what other investigators have reported or do differences exist (what else)?

Conclusion

The conclusion is the answer to the question formulation that is asked at the end of the introduction. The conclusions should be based on the results and discussions described earlier. Add suggestions or feedback for further research.

Acknowledgments

Acknowledgments for all research contributors, if any, should be stated briefly on the manuscript before reference.

Conflict of Interest

All submissions to Jurnal Rekonstruksi dan Estetik (JRE) must include a conflict of the interest disclosure statement or a statement from the authors stating that they have no conflicts to disclose.

Funding Disclosure

The authors should state how the research was funded in this section, including grant numbers if applicable.

Authors' Contributions

All of the authors have contributed to the planning, data collection and analysis, writing, and approval of this paper for the publishing stages of the research.

References

References should be arranged in accordance with the Vancouver system. Journal managers advise authors to use Mendeley-specific app or other reference apps (for example: Endnote, Zotero, ReffWorks). References should be numbered consecutively in the order in which the citation is first mentioned in the text, written with superscript, and placed at the end

of the text in numerical rather than in alphabetical order. Reference must be valid, 80% comes from publications in the last 10 years and contains at least 40% of primary references (from journals, theses, dissertations, and patent documents). Unpublished sources, such as a preparatory or personal communication script, can not be accepted as a reference. Only the sources cited in the text appear in the reference list. The author's name should be written consistently. The number and volume of a journal should be included. Editions, publishers, cities, and page numbers of textbooks should be included. Referrals downloaded from the internet, including access times and web addresses, should also be included. Abbreviations of journal names should be written in full.

Reference to a journal publication:

1. Albright JM, Davis CS & Bird MD. The acute pulmonary inflammatory response to the graded severity of smoke inhalation injury. Critical Care Medicine 2012;40: 1113-21.
2. Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukemia in Europe after Chornobyl: 5 years follow up. Br J Cancer 1996;73; 1006-12.

Reference to a book:

1. Herndon DN, Enkhbaatar P & Sousse LE. The pathophysiology of inhalation injury. In Herndon DN, editors. Total Burn Care, 4th ed. Edinburgh: Saunders Elsevier; 2017. p. 465-78.
2. Noer MS, Saputro ID & Perdanakusuma DS. Penanganan Luka Bakar. Surabaya : Airlangga University Press; 2006.

Reference to a website:

1. ISSVA Classification for Vascular Anomalies. 2018. (Accessed 5 October 2019). Available from: https://www.issva.org/UserFiles/file/ISSVA-Classification-2018.pdf
2. Rathbun AH, West J & Hausken EG. Young children's access to computers in the home and at school in 1999 and 2000, NCES-2003-036. National Center for Education Statistics, Washington, DC. 2003. (Accessed 4 November 2003). Available from: http://nces.ed.gov/pubs2003/2003036.pdf

Reference in a proceeding:

1. Idrus Jus'at. Penyimpangan positif masalah KEP di Jakarta Utara dan di Pedesaan Kabupaten Bogor Jawa Barat. in Prosiding WNPG VII; 2000. p.153–6.
2. Rachmah Q, Wantanee K. Energy Distribution Of Macronutrients Among Adolescents In Indonesia: Secondary Analysis Of Total Diet Study Data. in 4th Asian Academic Society International Conference (AASIC); 2016. p.170–6.

Bachelor thesis, master thesis, or dissertation:

1. Sumanto, HRA. Komponen - komponen emas (tesis Doktor). Surabaya: Universitas Airlangga; 1997.
2. Wulandari EC. Pengaruh pemberian glutamin per enteral terhadap peningkatan makrofag pada model tikus (Rattus norvegicus) dengan luka bakar kontak termal (tesis). Surabaya: Universitas Airlangga; 2020.

Patent:

1. Cookson AH. Particle trap for compressed gas insulated transmission systems. US Patent 4554399; 1985.

SUBMISSION PREPARATION CHECKLIST

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

1. The submission has not been previously published, nor is it before another journal for consideration (or

an explanation has been provided in Comments to the Editor).

2. The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.
3. Where available, URLs for the references have been provided.
4. The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.
5. The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines, which is found in About the Journal.
6. If submitting to a peer-reviewed section of the journal, the instructions in Ensuring a Blind Review have been followed.

COPYRIGHT NOTICE

1. The journal allows the author(s) to hold the copyright of the article without restrictions.
2. The journal allows the author(s) to retain publishing rights without restrictions
3. The formal legal aspect of journal publication accessibility refers to Creative Commons Atribution-Share Alike 4.0 (CC BY-SA).

PRIVACY STATEMENT

The names and email addresses entered in this journal site will be used exclusively for the stated purposes of this journal and will not be made available for any other purpose or to any other party.

INDEXED IN

EBSCO Google Scholar Crossref GARUDA Scilit BASE