



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

Doni Setiawan^a, Alexandria Stephanie^{b*} , Yugos Juli Fitra^a

^aPlastic Reconstructive and Aesthetic Surgeon, Dr. Soedarso General Hospital, Pontianak, Indonesia

^bPlastic 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 :

Creative Commons Attribution-ShareAlike 4.0 International License (CC-BY-SA)

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.

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.

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.

INTRODUCTION

Severe auricular trauma, especially complete amputations, is a rare injury^{1,2}. In addition, the severed ear is a major

challenge for plastic surgeons³. 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 pedicle⁴. 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 ear⁴.

Since 1898, several reattachment techniques have been developed, but only a select few have produced acceptable cosmetic results². 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 expectations².

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 surgeons⁶. 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 area⁶.

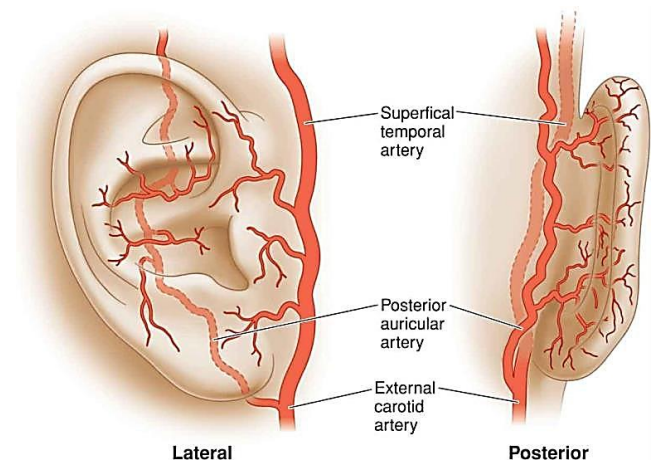


Figure 4. Arterial supply of the ear⁸

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 procedures⁹. 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 vascularity⁶. 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 match⁷.

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 Cartilage¹⁰. 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 auricle¹¹.

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 Invest 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.00000000000010611.
 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.