

Case Report

Facial reconstruction using polypropylene mesh after resection of maxillary ossifying fibroma

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ABSTRACT

Background: Ossifying fibroma is a variant of fibrous dysplasia and categorized as osteofibrosis lesion. It commonly affects long bones but occasionally involves jaws. Mandible affected more common than maxilla. The treatment of ossifying fibroma include excision and resection. Excision of lesion and resection of maxilla could cause facial defect which cannot be reconstructed with bone graft. **Purpose:** The aim of this case report is to report the potential use of polypropylene mesh in facial reconstruction after hemimaxillectomy in patients diagnosed with ossifying fibroma of the maxilla. **Case:** A 17-years-old female patient came to Oral and Maxillofacial Surgery clinic, Dental Hospital, Faculty of Dentistry, Airlangga University, with chief complaint of swelling in the upper left cheek of 2 years duration which was not related to any history of toothache. Patient also complained of the itchiness and pain on the swelling area occasionally as well as salty discharge from the mass. The FNA was done and the citology result indicated a benign mesenchymal tumor. Incisional biopsy was subsequently performed and the histopathology report confirmed the diagnosis of cementifying fibroma. **Case management:** Left hemimaxillectomy was done, and post surgical defect in the facial and buccal aspect was immediately reconstructed using three layers of polypropylene mesh. On follow-up, eleven months post-operatively, the patient was well and there was no facial deformity or asymmetry. **Conclusion:** Polypropylene mesh is a potential material for facial reconstruction as it can reduce the risk of facial deformity after hemimaxillectomy of patients with tumor of the maxilla.

Key words: Polypropylene mesh, maxilla reconstruction, hemimaxillectomy, ossifying fibroma

ABSTRAK

Latar belakang: Ossifying fibroma merupakan varian dari fibrous dysplasia dan termasuk di dalam kategori lesi osteofibrosis. Umumnya mengenai tulang panjang tetapi dapat juga mengenai rahang dan lebih banyak menyerang tulang mandibula dibanding maksila. Perawatan ossifying fibroma dilakukan dengan eksisi atau reseksi. Perawatan eksisi atau reseksi tulang maksila dapat mengakibatkan deformitas wajah yang tidak dapat direkonstruksi dengan bone graft. **Tujuan:** Laporan kasus ini bertujuan untuk melaporkan penggunaan polipropylene mesh pada rekonstruksi wajah setelah hemimaxillectomy pada pasien dengan diagnose ossifying fibroma pada maksila. **Kasus:** Penderita wanita berusia 17 tahun datang ke Klinik Bedah Mulut dan Maksilofasial, Rumah Sakit Gigi dan Mulut Fakultas Kedokteran Gigi Universitas Airlangga, dengan keluhan utama pembengkakan pada pipi kiri atas yang muncul sejak 2 tahun yang lalu tanpa ada riwayat keluhan sakit gigi. Penderita mengeluh gatal, kadang sakit dan keluaranya cairan asin pada daerah benjolan. Hasil FNA dan test sitologi menunjukkan gambaran tumor jinak mesensimal. Pemeriksaan dengan biopsi dan histopatologi mengkonfirmasi diagnosa cementifying fibroma. **Tatalaksana kasus:** Dilakukan hemimaksilektomi pada sebelah kiri, dan defek pasca pembedahan pada sisi fasial dan bukal segera direkonstruksi dengan pemasangan polipropylene mesh 3 lapis. Sebelas bulan setelah operasi kondisi pasien baik dan tidak ada deformitas atau asimetri wajah. **Kesimpulan:** Polypropylene mesh merupakan bahan yang potensial untuk rekonstruksi wajah karena dapat mengurangi terjadinya deformitas wajah setelah hemimaxillectomy pada pasien dengan tumor maksila.

Kata kunci: Polypropylene mesh, rekonstruksi maksila, maksilektomi, ossifying fibroma

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INTRODUCTION

Ossifying Fibroma is a neoplasm consisting of fibrous tissue that contains a mixture of trabecular bone, cementum as spherules or both.¹ Ossifying fibroma or cemento-ossifying fibroma or cementifying fibroma, are also called osteogenic neoplasms. It may be a variant of fibrous dysplasia and included in the category of osteofibrosis lesion. The jaw lesions are well-circumscribed and slowly growing. Because of the slow growth, the cortical plates of the bone and the overlying mucosa or skin are invariably intact. They are generally asymptomatic until the growth produces a noticeable swelling and mild deformity; displacement of teeth may be an early clinical sign. Pain and parathesia are rarely associated with an Ossifying Fibroma.¹⁻⁴ Most often found in the third and fourth decades, frequently occur in female

Radiographically, at an early stage shows well demarcated radiolucent area appearance, which turn rapidly into calcified lesions, and the lesion edges become less clear. Overall, radiographic view describes radiolucent area containing various level of radiopacity along with resorption and diverging of tooth apical. Rare case shows fully radiopaque area with radiolucent edge.

Ossifying fibroma was treated with wide excision or enucleation. Treatment includes surgical removal of the lesion including the periosteum which reduces the high recurrence rate.⁵ Resection of the maxilla, however, would usually result in noticeable facial defect. The defects are usually reconstructed directly with surgical obturators. They are usually constructed from base plate made of acrylic splint using the remaining contralateral teeth as retainers. They serve to support the defect obturator usually made of silicone impression material. However, in cases where all the maxillary teeth are retained after tumor resection, it is not possible to use such methods. Therefore, certain materials are required to support the facial defect which do not use palatal splint.

Polypropylene mesh is prosthetic, non absorbable, standard flat mesh made from polypropylene which has a tensile strength that is physiologically required.⁶ Polypropylene material was commonly used as prosthesis for hernia repair to close the abdominal wall defect. Polypropylene mesh was also used on reconstruction of auricular defect as alloplast.⁷⁻¹²

The following case is Ossifying Fibroma which has extended to buccal part of maxilla and a half part of zygoma, so that the tumor resection had resulted in a facial deformity. To compensate for the deformity, the authors performed a reconstruction where the inside of the maxillary buccal wall part was supported with 3 layers of foldable polypropylene mesh material. In the author's opinion this is a novel technique in that this material has never been used for facial reconstruction. The purpose of this case report is to present the potential use of polypropylene mesh as one of reconstruction materials in oral and maxillofacial tumor surgeries.

CASE



Figure 1. Preoperative extraoral view. On frontal view (left) a ill-defined border, smooth surfaced mass was seen on the left cheek and maxilla, which has normal color. On left view (right), a mass was noted over left zygomatic bone.

A 17-years-old female patient came to Oral and Maxillofacial Surgery clinic, Dental Hospital, Faculty of Dentistry, Airlangga University, with chief complaint of swelling in upper left cheek which has been growing for the past 2 years, and not related to any history of toothache. Patient also complained of itchiness and pain on the swelling area occasionally, and there was salty discharge from the mass. On the previous treatment by Hospital in Tuban, analgesic and antibiotics were prescribed.

Extra oral examination showed facial asymmetry, a mass was noted over the left cheek with unclear border, showing smooth surface and normal color (Figure 1). Intra oral examination showed elevated nasolabial sulcus, a mass was seen over both the palatal and buccal aspect from canine to upper first molar, 4 × 6 cm in size, solid hard and tender on palpation. There was a pus and salty discharge from the mass via drainage in the buccal mass. There were no loose teeth and no dental caries observed (Figure 2).



Figure 2. Preoperative intra oral view. Noted over left cheek, a mass with unclear border and elevated of nasolabial sulcus.

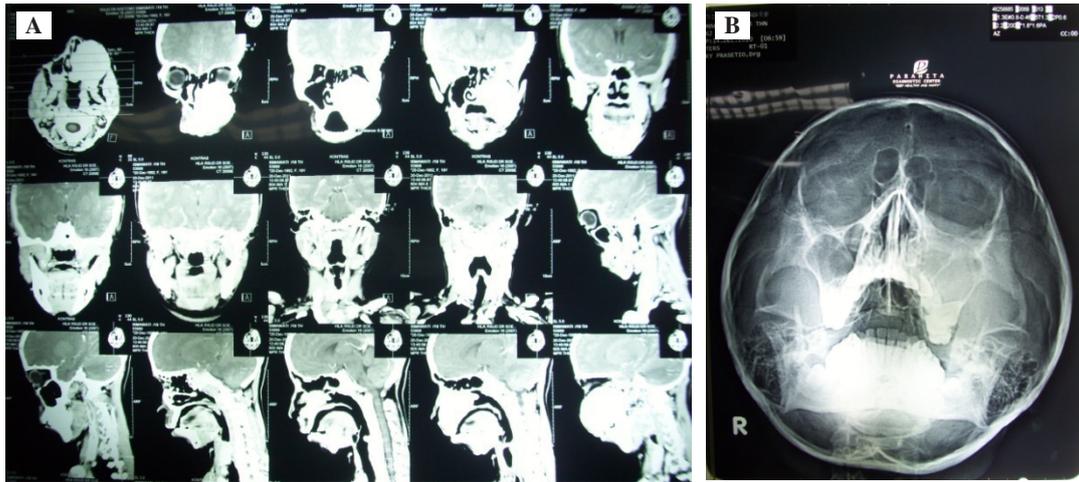


Figure 3. Preoperative CT Scan and Water's radiographic view. CT scan showed a solid mass in the left sinus maxillary with calcified components inside and nasal septal deviation to the right (A). Water's radiographic showed radiopaque area in left maxilla (B).

CT Scan examination showed a solid mass in the left sinus maxillary, $6.35 \times 5.27 \times 6.08$ cm in size, with calcified components inside causing erosion of the left maxillary sinus bone walls to the base of the left orbital cavity and extends to the right causing nasal septal deviation to the right. Water's radiographic showed radiopaque area in left maxilla (Figure 3). Open biopsy was performed preoperatively and the histopathology report showed Cementifying Fibroma with no signs of malignancy.

CASE MANAGEMENT

Since the tumor has spread to the left eye, joint operation with ophthalmologist was performed to ensure tumor free margin in the inferior border of orbita. Hemimaxillectomy was performed with Ferguson Weber design incision to

obtain a wide view of zygoma area. The tumor, on the buccal aspect, was found to have extended to the zygomatic area. The tumor and the surrounding maxillary bone was then resected. After tumor resection a large facial and buccal defect was found causing noticeable assymetry. To overcome the defect, three layers of foldable polypropylene mesh were placed inside the wall of maxillarybuccal area, and sutured into surrounding tissue. Since these material are relatively thick and rigid. They were able to support the bulk of facial and buccal soft tissue thus resulted in facial convexity and symmetry (Figure 4).

Histopathology examination of the lesion showed a benign neoplastic tissue which was composed of proliferating fibroblast, with spindle-shaped, uniform nuclei showing fine chromatin. Calcifying bone trabeculae were seen. There was no sign of malignancy.

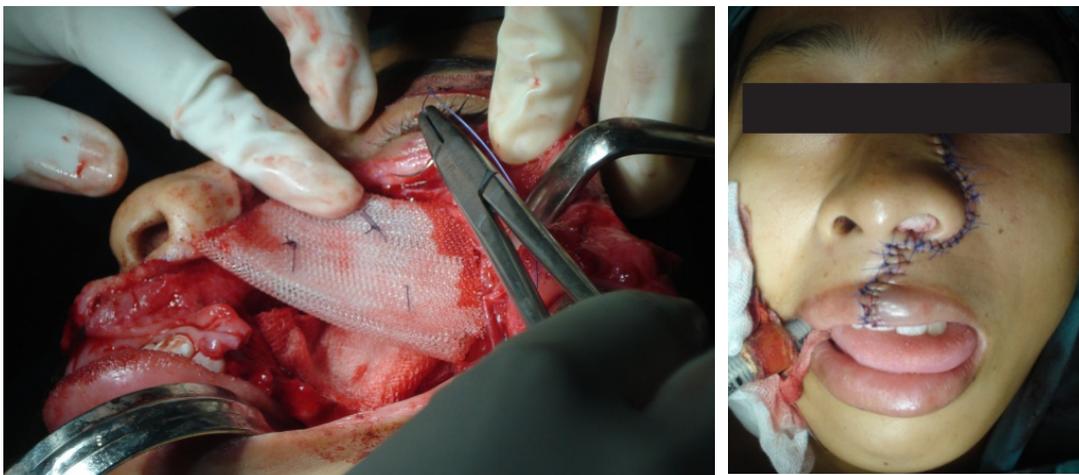


Figure 4. Application of propylene mesh in defect area. The mass was sutured into near tissue (left). Suturing postoperative (right).



Figure 5. Day-9 Postoperative extra oral view. From frontal and lower view showed no difference between left and right facial and zygomatic area.



Figure 6. Day 9 postoperative intra oral view. The mucosa had normal color and well sutured.



Figure 7. Eleventh month postoperative. Extraoral view showed minimum asymmetry (left). Intraoral view showed normal mucosa color (right).

Post surgery evaluation showed a satisfactory result. Day-9 post surgery showed that there was no facial asymmetry (Figure 5). Intra orally, there was no signs of soft tissue inflammation which would indicate that there was no rejection against polypropylene mesh material (Figure 6).

At follow-up 11 months postoperatively, the patient was well and there was minimum facial asymmetry. Intra orally, there was no signs of material rejection and wound seemed to have healed properly (Figure 7).

DISCUSSION

From clinical and radiographic examination of the case above, the tumor may be diagnosed as ossifying fibroma or fibrous dysplasia due to the same view. However the treatment of both cases are quite difference of which ossifying fibroma is usually treated radically with wide excision or enucleation because of the recurrency rate, whereas fibrous dysplasia was treated with a surgical contouring of the mass to restore to normal. Bone retrieval is easy to do because the bone is generally soft and bone retrieval was performed to obtain better healing. Therefore, histopathology diagnosis is required with a careful examination because will determine the treatment plan of the case.

Maxillary tumor surgery was performed with two techniques; according to Weber-incision pattern-Longmire Verguson, and patterns according Midfacial degloving incision.⁵ In this case, the hemimaxillectomy was performed using incision pattern of verguson Weber, therefore a wide view of zygoma area could be obtained. On the walls of the maxillary buccal area, there is an extension of the tumor in the part of zygoma, so that the resection would be resulting a facial deformity. To reduce the deformity, the authors performed the reconstruction of the maxillary buccal wall part using 3 layers of foldable polypropylene mesh material. The material was thick and stiff,^{6,13-15} therefore it could support the bulk of soft tissue of the face and cheek, reducing the facial deformity.

Polypropylene mesh material has never been used for post maxillectomy reconstruction. Polypropylene mesh was chosen because of its strong ideal material prothesis, flexible, non-allergenic, inert, non-biodegradable, non-carcinogenic and should stimulate fibroblastic activity for optimal tissue healing, connecting to normal tissue. Polypropylene material was commonly used as prothesis for hernia repair to close the abdominal wall defect. Polypropylene mesh was also used on reconstruction of auricular defect as alloplast.⁷⁻¹² This is in accordance with the result of this case report. At follow up review 11 months postoperatively, polypropylene mesh material that was used in this case did not cause any complaints from the patient nor sign of material rejection. It is, therefore, considered biocompatible for use as permanent biomaterial in oral and maxillofacial region.

It can be concluded that polypropylene mesh can be used as reconstruction material after hemimaxillectomy on patient with ossifying fibroma. The material can support the facial and buccal soft tissue to reduce the resulting facial deformity. Besides, polypropylene mesh is clinically safe and biocompatible to be used as a permanent alloplastic material in oral and maxillofacial tumor surgery.

REFERENCES

1. Knutsen BM, Larheim T A, Johannessen S, Hillestad J, Solheim T, Stromme Koppang H. Case report recurrent conventional cemento-ossifying fibroma of the mandible. *Dentomaxillofacial Radiology* 2002; 31: 65–8.
2. Canger EM. Familial ossifying fibromas: report of two cases. *Journal of Oral Science* 2004; 46(1): 61–4.
3. Tamiolakis DE, Tomaidis VA, Tsamis IO. Cemento-ossifying fibroma of the maxilla: A case report. *Acta Stomatologica Croatica* 2005; 39: 319–21.
4. Neville BW, Damm DD, Allen C, Bouquot J. *Oral and maxillofacial pathology*. 2nd ed. Philadelphia: WB Saunders; 2002. p. 563–4.
5. Converse JM. *Reconstructive plastic surgery*. 2nd ed. Philadelphia: WB Saunders Co; 1977. p. 2578–86.
6. Vrijland WW. Mesh repair of hernias of the abdominal wall. Rotterdam: Educost Publishers; 2003. p. 43–50.
7. Soames JV, Joutham JC. *Oral pathology*. 3rd ed. Oxford: Oxford University Press; 1999. p. 292–5.
8. Parra JA, Revuelta S, Gallego T. Pictorial Review: Prosthetic mesh used for inguinal and ventral hernia repair: normal appearance and complications in ultrasound and CT. *Brit J Rad*. 2004; 77: 261–5.
9. Lin G, Lawson W. Complications using grafts and implants in rhinoplasty. *Op Tech Otolaryng*. 2007; 18: 315–23.
10. Doctor HG. Symposium: Evaluation of various prosthetic materials and newer meshes for hernia repairs. *J Min Acc Surg* 2006; 2(3): 110–6.
11. Klosterhalfen B, Junge K, Klinge U. Review: The lightweight and large porous mesh concept for hernia repair. *Expert Rev Med Devices* 2005; 2(1): 1–15.
12. Paula E, Silva E, Toledo OA. Tissue repair after orbital reconstruction using polypropylene mesh implants: a histological study in dogs. *Rev Odonto Scienc* 2009; 24(4): 396–400.
13. Paula E, Silva E, Rosa ELS, Barbosa SV. Tissue reactions to polypropylene mesh used in maxillofacial trauma. *Braz Dent J* 2001; 12(2): 121–5.
14. Schmidbauer S, Ladurner R, Hallfeldt KK, Mussack T. Heavy-weight versus low-weight polypropylene meshes for open sublay mesh repair of incisional hernia. *Eur J Med Res* 2005; 10: 247–53.
15. Conze J, Kingsnorth AN, Flament JB. Randomized clinical trial: randomized clinical trial comparing lightweight composite mesh with polyester or polypropylene mesh for incisional hernia repair. *Brit J Surg* 2005; 92: 1488–93.