
The Use of Free Fibular Flap with De-epithelization Technique for Reconstruction of Oral and Mandibular Squamous Cell Carcinoma in Elderly: A Case Report

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ABSTRACT

Background: The number of elderly patients with malignant head and neck tumors has been rising, resulting in an increase in the number of elderly patients requiring complex reconstructive surgery. The mandible is an important part of the human face, so in cases of mandibular reconstruction, the surgeon has a major responsibility to maximize function as well as cosmetics. The free fibular flap has been commonly used for mandibular reconstruction with its own indications, advantages and disadvantages. **Methods:** A 68-years-old Man with chief complaint a not healing lesion on the mandible. The patient was diagnosed with oral and mandibular squamous cell carcinoma. The patient underwent total jaw resections and after that a free fibular flap was used immediately for mandibular reconstruction. **Result:** On post-operative days 3- 6 free fibular flaps demonstrate colour and fine aesthetic appearance. There were no major post-operative complications. There no signs of infection, vascular crisis and haematoma were observed. **Conclusion:** The free fibular flap and de-epithelization technique are a safe and dependable options for comprehensive functional and aesthetic mandibular defect in elderly.

KEYWORDS: Free fibular flap, De-epithelization, Mandibular squamous cell carcinoma.

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BACKGROUND

The number of elderly patients with malignant head and neck tumors has been rising along with the overall increase in life expectancy, resulting in an increase in the number of elderly patients requiring complex reconstructive surgery.¹

The mandible is an important part of the human face and has an important role in orofacial function as a platform for the dentition. Traumatic, ablative, and congenital abnormalities of the bony mandible cause considerable physical and psychosocial difficulties in affected patients' daily lives.² In cases of mandibular reconstruction, the surgeon has a major responsibility to maximize function as well as cosmetics and to preserve quality of life by restoring mastication, speech, and appearance.^{3,4}

The free fibular flap has been commonly used for maxillary and mandibular reconstruction. The main advantage of using this free flap over other vascularized flaps was its ability to provide the most bone length, allowing

reconstruction even after total jaw resections.¹ The fibula has good bone stock and sufficient bone length that the mandibular contours are easily osteotomised. There is also a long vascular pedicle and a reliable skin flap, which enables simultaneously reconstruction of intraoral and/or external face defect. Where a large defect exists, soft tissue is insufficient, or the recipient bed has been affected by radiation, chronic infection, or prior surgery, vascularized bone has historically been reserved for more complex secondary reconstructions.^{1,3,4}

Despite the fact that each of these flaps has its own indications, advantages and disadvantages, it is widely agreed that the fibular flap is the most suitable for bridging a long-span mandibular deficiency of more than 12 cm.

The purpose of this report is to share our experience with free fibular flaps for comprehensive reconstruction of discontinuity defects in the mandible following combined

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resections of malignant odontogenic tumors, with a focus on the functional aspects of the reconstruction.

CASE REPORT

A 68-years-old Man was admitted to Oncology Surgery Department Gatot Soebroto Indonesia Army Central Hospital with chief complaint a not healing lesion on the mandible. Using the radiological, clinical and histological findings as a foundation a preliminary diagnosis of oral and mandibular squamous cell carcinoma. The patient underwent total jaw resections, performed under general anaesthesia with

multidisciplinary team included surgical oncologists and plastic surgeon.

After underwent total jaw resections, a free fibular flap was used immediately for mandibular reconstruction. Before the operation began, the length of the flap, were measured in the donor limb's lateral section. With the use of a Doppler, perforators artery were discovered and marked on the skin with ink tattooing. We designed flap from the donor area first, size of skin pedicle was 7x10 cm, and the length of fibula was +/- 7 cm.

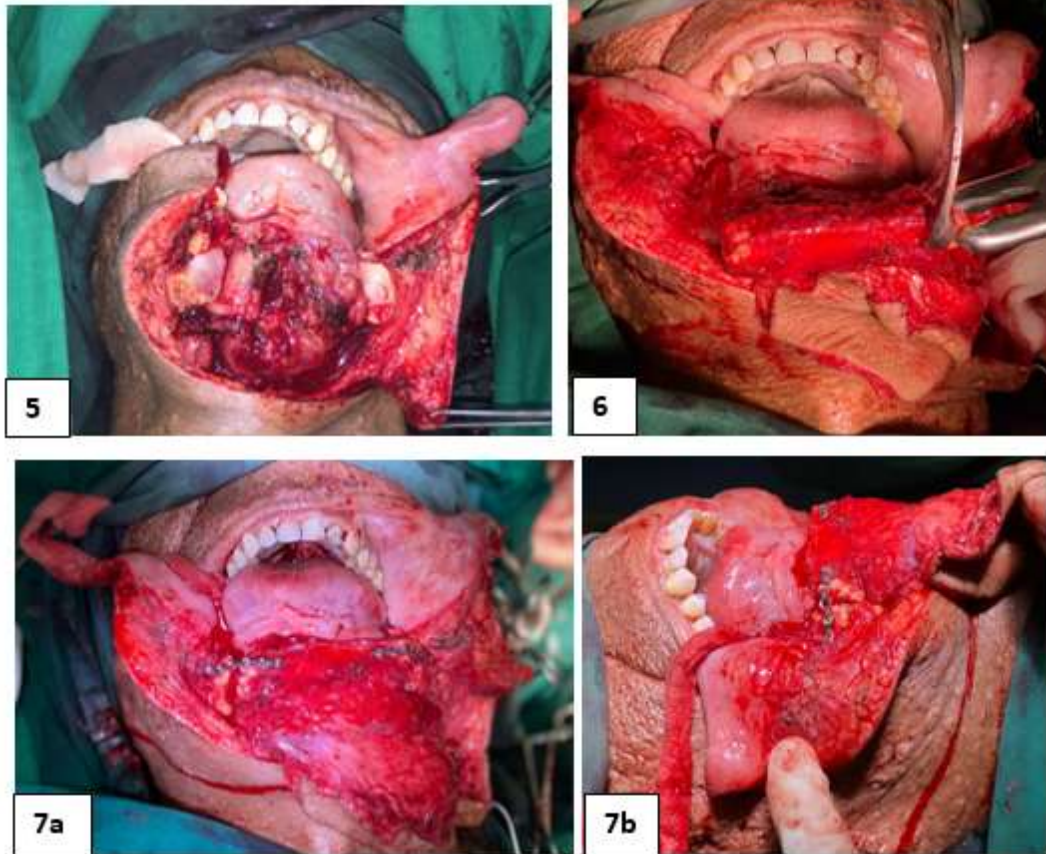


Picture 1. Design of Free Fibular Flap in the donor limb's lateral section
Picture 2,3,4. Harvesting Free Fibular Flap

We used the lateral approach for harvesting the fibular flap. This is performed using tourniquet to facilitate visualization and speed of the dissection in a bloodless area. Dissection was continued around the fibula, retaining a small cuff of muscle to protect the periosteal blood supply to the bone. The tourniquet was removed once the peroneal artery

and its vena comitantes were discovered. After completing the perforator dissection, the harvest continues anteriorly along the length of the fibula, taking care to leave a few millimeters of muscle attached to the bone to avoid disrupting the periosteum's vascular supply

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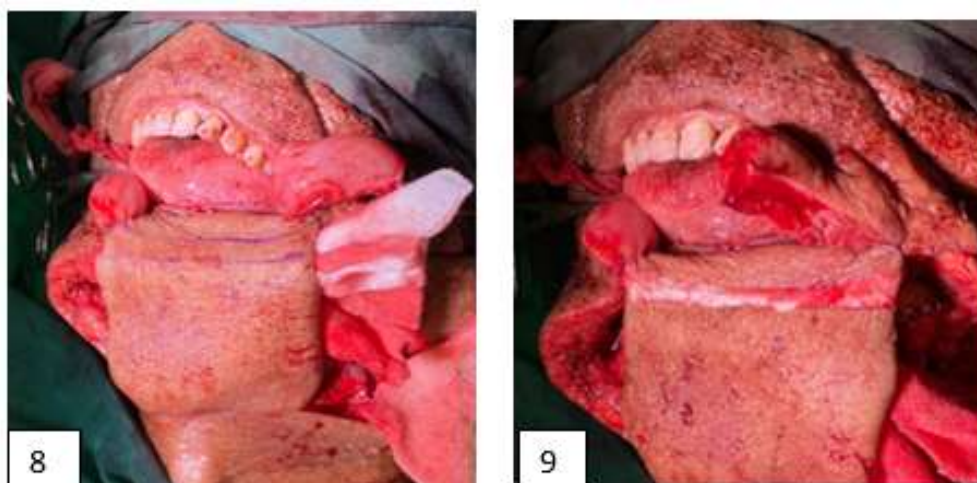
Picture 5. Clinical photo showing intraoral aspect after total jaw resection

Picture 6. The Free Fibular Flap and the skin paddle was insert intraorally

Picture 7a &b. The Free Fibular Flap fixed at the recipient site using miniplates 2.0 screw 5 holes

The flap artery and two flap veins were then anastomosed to the recipient vessels, or to the vein grafts. Peroneal artery to be anastomosed end to end to artery facialis. Vena comitantes to be anastomosed end-to-end to vena jugular externa. The flap was transferred then fixed into place at the recipient site using miniplates 2.0 screw 5 holes, prevent the vascular pedicle from kinking and the skin paddle was insert intraorally.

We did de-epithelization technique to reconstruct the lips for comprehensive functional and aesthetic mandibular defect reconstruction. Bleeding control was performed and a suction drain was introduced. The wound of recipient and donor were closed primarily, and the vascularity was monitored continuously on the post-operative day.



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Picture 8 & 9. De-epithelization technique to reconstruct the lips
Picture 10 & 11. Primary closure and bleeding control with drain in recipient area.



Picture 12. On postoperative day 3. The Free Fibular Flap is viable.

DISCUSSION

The mandible is an important part of the human face and has an important role in orofacial function. In cases of mandibular reconstruction, the surgeon has a major responsibility to maximize function as well as cosmetics and to preserve quality of life by restoring mastication, speech, and appearance.²

With the aim of obtaining optimal conditions to achieve aesthetic and functional goals, the use of free fibular flaps is necessary. Since its first description by Taylor and associates in 1975, the free fibular flap has previously been proven affective for the treatment of large bony defects. Nowadays, an increasing number of microsurgical centers around the world have established the widespread use of this flap, mostly in facial reconstruction.⁵

Fibular flap are capable of supplying adequate soft tissue and bone. The long, thick bicortical bone part has good intrinsic rigidity to bear physical stress. This is required to stabilize the mandible after reconstruction. The fibular flap has an almost constant vascular distribution and can be easily harvested in segments over 15 cm in length with a vascular pedicle of adequate quality. Additionally, the fibular bone has a periosteal blood supply that allows for multiple osteotomies in case of extended mandibular reconstruction. Because it allows for the formation of proper anatomic relations for dental implant placement and dental rehabilitation, soft tissue reconstruction in a composite mandibular defect is extremely important for oral reconstruction.³

For restoring appearance of the patient, we did de-epithelization technique to construct the lips. De-

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epithelization is a technique by which a graft or a flap is thinned out of the split thickness or full thickness skin layer. The underlying fat tissue is thus covered more or less by corium only. ⁶

To keep the flap viable, we did post-operative flap monitoring continuously. The most visible sign of flap condition is a change in skin colour, but other factors like morphology, texture and temperature can also tell important information about the flap condition. ⁷ We used light that was placed near patient to make the flap keep warm. Vascular crisis and haematoma were the most frequent major complications in free flap, which require exploration as soon as possible. In this case, we also did additional tests such as the capillary refill test, acupuncture bleeding test, and Doppler were needed.

On post-operative days 3- 6 free fibular flaps demonstrate colour and fine aesthetic appearance. There were no major post-operative complications. There no signs of infection, vascular crisis and haematoma were observed.

It should be considered that this study has some limitations such as loss of patient's follow up. It would be great to bring out a larger-sampled case with strict follow up for further understanding of the use of free fibular flap itself.

CONCLUSION

In conclusion, for comprehensive functional and aesthetic mandibular defect reconstruction, the free fibular flap and de-epithelization technique are a safe and dependable option in Elderly. The procedures significantly contribute to preserve the patient's quality of life.

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