ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

THE RETROSPECTIVE STUDY OF ASSESSING EFFICACY OF FREE FIBULA FLAP FOR COMPOSITE ORO-MANDIBULAR DEFECT

Plastic Surgery

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ABSTRACT

Patients and Methods: Out of 455 free flaps, our study included 163 cases of oral cancer with stage III and stage IV operated in our institute from 2013 to 2018. 95 were male and 68 were female with age from 45-75yrs. All composite oromandibular defect was reconstructed with vascularised osteomyocutaneous free fibular flap, followup from 6 months to 2 years to evaluate the efficacy of free fibular flap.

Result: 154 cases (95%) of free fibula flap reconstruction had a good recovery, 9 cases (5%) had re-exploration, out of that in 2 cases we used regional flaps and in 1 case we used second free fibular flap.,24 cases(15%) had wound dehiscence, 154 patient (95%)started oral feeding, with 146 patients(90%) had good swallowing, mastication ,articulation function.

Conclusion: Osteomyocutaneous free fibula flap is workhorse flap for reconstruction of composite oro-mandibular defect due to a single stage procedure, provides good functional and aesthetic result.

KEYWORDS

Oro-mandibular defect, Free fibular flap, Oral cancer

INTRODUCTION:

The mandible involved in trauma, radiation or congenital anomalies, but the most frequent cause is tumor-related surgery. [1,2] After resection of tumour the mandibular defect created that classified in form of lateral (L), central (C), or hemi-mandible (H). Combined defects are described as HC, LCL, etc. This defect usually leads to severe functional and aesthetic morbidity.

The vascularised free fibular flap (FFF) is a vascularised free composite flap containing bone and muscle, with or without skin and provides reliable single-stage reconstruction with excellent functional and aesthetic results. Other vascularised bone flaps used in the head and neck include iliac crest, scapula and radial forearm flaps.[2]The fibula was first recognized as a vascularized flap for long bone reconstruction in 1975 by Taylor et al.[3] Subsequently, Hidalgo in 1989 reported adapting the flap to mandibular reconstruction, showing that the bone could be safely osteotomized multiple times to simulate the refined nuances of the mandible's shape.[4] It has been shown that 25 cm of useful fibular length provides sufficient bone stock to reconstruct major mandibular defects. Furthermore, the dimensions of the fibula have been shown to adequately support the use of osseointegrated implants.[5] Large skin paddles based on distal septocutaneous perforators can be reliably harvested with the fibular bone.[6] The fibula flap also can be harvested to include the flexor hallucis longus and soleus muscles to provide additional flap bulk.[7]

Composite oromandibular defects, which involve the loss of a large volume of soft tissue, including the tongue, floor of the mouth, and alveolar intraoral regions, in addition to the bony defect, often require mandibular reconstruction with soft tissue coverage and here the vascularised free fibular flap used safely . In some cases, a second flap is required for inner lining of defect that provides adequate tissue, for these reason free fibula flap is combined with the radial forearm fasciocutaneous flap. The purpose of this study was to assess the efficacy of free fibula flap for composite oro mandibular defect in oral cancers as well as assess the quality of life .

METHODS AND MATERIAL:

A retrospective study included 163 patients of oral cancer with stage III and IV undergoing FFF mandibular reconstruction between 2013 and 2018 in the Plastic Surgery Department of SMS Hospital in jaipur. In our institute, 455 case had free flap operation, out of that 163 case of oral cancer underwent free osteomyocutaneous fibular flap for oromandibular defect. 95 were male and 68 were female with age from 45-75yrs (mean age 60 yrs). Mandibular defect was graded on the Jewer classification,C = symphysis and parasymphysis resection; L = lateral segment(horizontal and ascending branches) without condylar resection; and H = resection involving the lateral part and articular condyle.[4] Preoperative clinical and CT work-up ensured oncologic control. The feasibility of fibula flap harvesting was checked on lower-limb arterial and venous Doppler ultrasound, to rule out any vascular abnormality. Mandibular bone resection limits were determined in the light of preoperative imaging and intraoperative findings. After getting written informed consent patient taken for surgery. Resection of the primary tumour and elevation of the FFF are done simultaneously as a 2 team approach in order to minimise the duration of surgery. After wide local resection of malignancy, massive composite oromandibular defect formed and leaving well-vascularized healthy bone on either side of defect. All specimens were sent for histologic analysis to confirm negative margin for malignancy and rule out recurrence or residual tumor. The fibula flap was harvested under pneumatic tourniquet and dissected as a purely muscle-bone composite osteomyocutaneous flap without skin paddle. Flap modeling and positioning required multiple osteotomy and titanium mini-plates used for osteosynthesis. Arterial anastomosis was performed using facial artery, the superior thyroid artery, or lingual artery or origin of the external carotid artery. We have used the internal jugular vein for venous anastomosis. Enteral feeding started until after good mucosal healing was obtained. The study focused on the functional as well as aesthetic results of this type of reconstruction.

Figure:1 Massive Oromandibular defect in Right lateral oral cancer and reconstruction with vascularised osteomyocutaneous free fibular flap

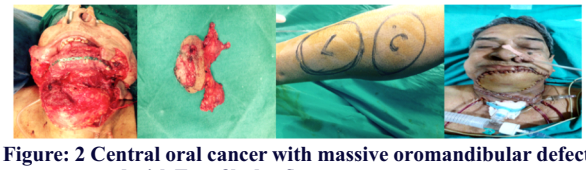

Figure: 2 Central oral cancer with massive oromandibular defect reconstructed with Free fibular flap

RESULT:

out of 163 cases of free fibula flap reconstruction done, after resection of massive composite oromandibular defect in oral cancer patients,154 cases (95%) had a good recovery.9 cases (5%) had re-exploration ,out of which we could salvaged 6 cases and in 3 cases flap necrosed. out of that 3 cases, in 2 cases we used regional flaps and in 1 case we used second free fibular flap. postoperatively free fibular flap gave satisfactory result in terms of both functionally as well as aesthetically. At Donor site, graft take is good as Suprafacial dissectionis done in leg, and that also minimises donor site morbidity. All patients were

followup from 6 months to 2 years. 8 case (5%) had pain over operated side of face,24 cases(15%) had wound dehiscence with orocutaneous fistula developed,154 patient (95%)started oral feeding, with 146 patients (90%) had good swallowing, mastication ,articulation function.

DISCUSSION:

The free fibular flap is the gold standard in mandibular reconstruction compared with other vascularized bone flaps, such as the iliac crest and the scapula. As fibula has length between 20 and 30 cm for flap, with multiple osteotomies optimizing the reproduction of the mandibular angles and contours [5]. The reliable skin paddle can be large, to fill large defects, and is thin, allowing good modeling. FFF allows dental implantation, whether in the same step or delayed [1]. Finally, donor site morbidity is low [5].Thus, FFF provides good-quality repair; as well as it enables recovery of mastication, swallowing, articulation and saliva retention and dental rehabilitation, thus allowing early resumption of oral feeding.[2] A much-disputed disadvantage of the fibula flap is the reportedly unreliable and scarce fasciocutaneous component of the flap. This has led many to advocate the use of 2 flaps for major complex defects of the mandible, floor of the mouth, and tongue. In such cases, the fibular flap is used to reconstruct the bony skeleton, whereas the second flap restores the large soft tissue requirement for the tongue and floor-of-mouth components. Furthermore, the double free flap procedure for 1-stage reconstruction of massive mandibular defects has been justified because of its safety, effective functional outcome, and improved quality of life achieved. Yu et al, described the reliability of the fibular skin blood supply and found that the fasciocutaneous component of the fibula flap is safe for harvest and can be designed with simplicity and confidence using common anatomic landmarks.[14] A complex composite resection of the tongue and mandible involves the floor of the mouth, gingiva, and sometimes the buccal mucosa, thus requiring a large area of harvested skin for repair of the defect. A customized template allows precise harvesting of the skin paddle and saves time with the flap inset. Accurate reconstruction of the tongue and soft tissue will result in better restoration of speaking and eating. Lateral defects might require release of the intercompartmental fascial septum to improve skin paddle rotation and reach. The skin paddle template also might be positioned in parallel with the bone, thus bringing it to an optimal position for hemiglossectomy and lateral mandibular defects. In present study we have assessed the efficacy of this free fibular flap ,functionally this flap gave support to remained part of mandible and patients recover early from massive oromandibular defect formed after resection of oral malingnancy. Some of the flap required reexploration in immediate post operative period, but salvage of flap is possible. Those flap had necrosis, was revised with the other regional flaps or second free fibular flap.

CONCLUSION:

Osteomyocutaneous free fibula flap is workhorse flap for reconstruction of composite oro-mandibular defect due to a single stage procedure with provides good functional and aesthetic result with less morbidity, improves the quality of life.

DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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