

How to harvest free fibula flap for mandibular reconstruction? Practical tips and tricks

Chirom A Singh, Rajeev Kumar and Pirabu Sakthivel*

Department of Otorhinolaryngology & Head and Neck surgery, All India Institute of Medical Sciences, New Delhi, India

Abstract

The initial use of free fibular flap was limited to the reconstruction of long bone defects of the extremities until 1989, where this flap was used for restoration of segmental mandibulectomy defects. Since then a number of detailed anatomic dissections and publications have helped to clarify the surgical anatomy of this versatile flap. The primary purpose of this video is to describe each and every step along with our easy tips for harvesting this versatile flap for primary mandibular reconstruction.

Introduction

The fibula is a long non-weight bearing bone of the lower extremity with adequate cortical thickness rendering it one of the strongest bones available for mandibular reconstruction [1]. Approximately 22 to 25 cm of bone can be harvested while preserving 6 to 7 cm of bone both distally and proximally to maintain the integrity of the ankle and knee joints as well as the common peroneal nerve, making this donor site unique in terms of the ability to restore total or subtotal defects of the mandible [2]. The strength of the cortical bone effectively withstands the powerful forces of mastication when used for mandibular reconstruction. The narrow fibula is also preferred in the secondary reconstruction of mandibular defects that involve the ramus and condyle as it is much easier to pass through the small tunnel for the placement of the graft into the glenoid fossa. The long straight fibula can be contoured to match the shape of mandible by creating wedge shaped osteotomies without compromising distal bone circulation. The thick cortical bone of the fibula appears to accept dental implants well [3,4].

Fibular flap anatomic considerations

The fibula can be transferred either as a free osseous or as a free osteocutaneous flap based on septocutaneous or musculocutaneous perforators arising from the peroneal artery and vein along the posterior crural septum. The vascular pedicle to the fibular flap although consistent in the location and calibre of the vessel's lumen is often limited in length by the bifurcation of the posterior tibial artery [4].

The peroneal artery and vein run along the entire length of the fibula without a significant change in the calibre of the vessel. This

arrangement permits the use of the fibula as a "flow-through" flap to supply a second free flap anastomosed to the free ends of the distal artery and vein.

When reconstructing the mandible, the bone should be oriented so that the vascular pedicle of the fibula is located on the lingual surface of the neomandible, which places the skin paddle along the inferior border. The skin can be delivered into the oral cavity by transposing it over the buccal surface, which also provides coverage of the fixation hardware. In addition, the cuff of the flexor hallucis longus provides augmentation in the submandibular region [4].

The lateral sural cutaneous nerve can be harvested and anastomosed to a suitable recipient nerve to restore sensation to the skin component and this can also be used as a sensate osteocutaneous flap [5].

How to harvest Free Fibula flap for Mandibular reconstruction- Practical tips and tricks

Dr. Chirom Amit Singh
Dr. Rajeev Kumar
Dr. Pirabu Sakthivel

Department of
Otorhinolaryngology and Head-
Neck Surgery, All India Institute of
Medical Sciences, New Delhi.

Harvesting free fibula flap for mandibular reconstruction

*Correspondence to: Pirabu Sakthivel, Room no 4057, ENT office, Fourth floor, Department of ENT & Head and Neck surgery, All India Institute of Medical Sciences, New Delhi – 110029, India, Tel: 9958744547; E- mail: pirabusakthivel@gmail.com

Received: March 16, 2019; Accepted: March 25, 2019; Published: March 29, 2019

References

1. Serra JM, Paloma V, Mesa F, Ballesteros A (1991) The vascularized fibula graft in mandibular reconstruction. *J Oral Maxillofac Surg* 49: 244-250. [[Crossref](#)]
2. Brown JS, Lowe D, Kanatas A, Schache A (2017) Mandibular reconstruction with vascularised bone flaps: a systematic review over 25 years. *Br J Oral Maxillofac Surg* 55: 113-126. [[Crossref](#)]
3. Lonie S, Herle P, Paddle A, Pradhan N, Birch T, et al. (2016) Mandibular reconstruction: meta-analysis of iliac- versus fibula-free flaps. *ANZ J Surg* 86: 337-342. [[Crossref](#)]
4. Abou-Foul AK, Fasanmade A, Prabhu S, Borumandi F (2017) Anatomy of the vasculature of the lower leg and harvest of a fibular flap: a systematic review. *Br J Oral Maxillofac Surg* 55: 904-910. [[Crossref](#)]
5. Boyd JB, Caton AM, Mulholland RS, Tong L, Granzow JW (2013) The sensate fibula osteocutaneous flap: neurosomal anatomy. *J Plast Reconstr Aesthet Surg* 66: 1688-94. [[Crossref](#)]