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**Abstract**

**Reconstruction of Composite Defect of Hand with Two Segmented Osteocutaneous Fibular Free Flap**

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The advent of free bone flaps has made successful replacement of extensive areas of bone loss in the upper and lower extremities. The microvascular free bone flaps have faster healing without bony absorption or atrophy and can heal in the hostile environment of scarred bed or infection. Since the fibula free flap introduced by Taylor and colleague in 1975, it has been used extensively for skeletal reconstruction of extremities. In 1988, the folded vascularized fibula free flap was first described as a technique to reconstruct significant long bone defect of upper and lower extremities. During the same time, the fibular free flap has evolved to become most preferred choice of mandibular reconstruction. Up to present day, few reports have been made on the fibular free flap used for reconstruction of injured hand containing metacarpal bone and soft tissue defect. We present here our new and unique experiences with vascularized fibular osteocutaneous free flap as useful and satisfactory one for reconstruction of hand with composite defects.

**Key Words** : Fibular free flap, Hand, Reconstruction

5,9,13)

Taylor

16)

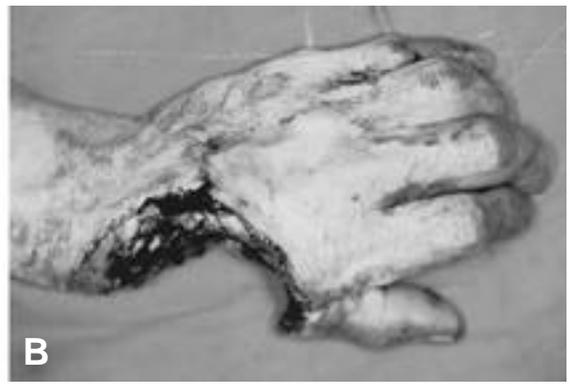
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55 (crush-avulsion) 9x  
 11cm  
 1 (trapezoid) 2  
 (6.5cm)  
 (extensor indicis),  
 (common palmar digital  
 nerve)  
 (Fig. 1,2).  
 princeps pollicis  
 2  
 (Fig. 1).  
 14cm 11x14cm osteo-septo-  
 cutaneous  
 6.5cm, 2cm 5.5cm  
 (in situ osteotomies) 2cm  
 (Fig. 3).  
 2  
 microplate

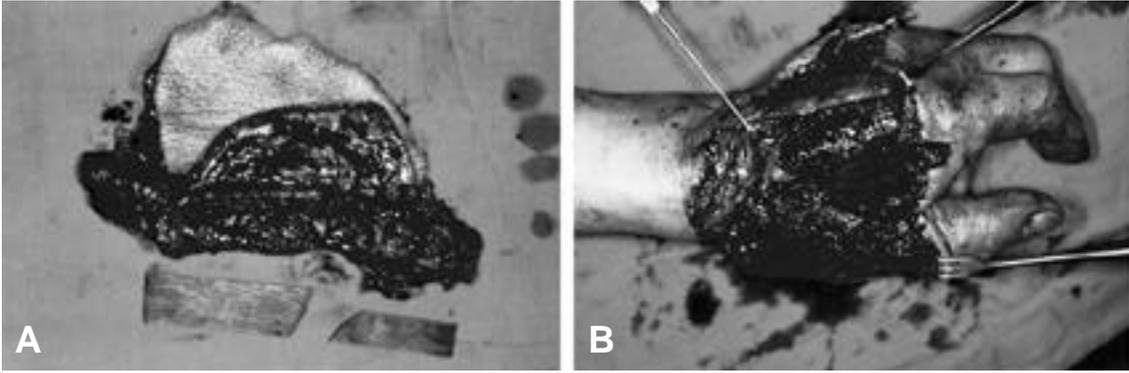
15 10  
 microplate  
 40  
 20  
 가  
 artery  
 princeps pollicis  
 flow-through  
 (Fig. 3).  
 10  
 2 1  
 (contour)



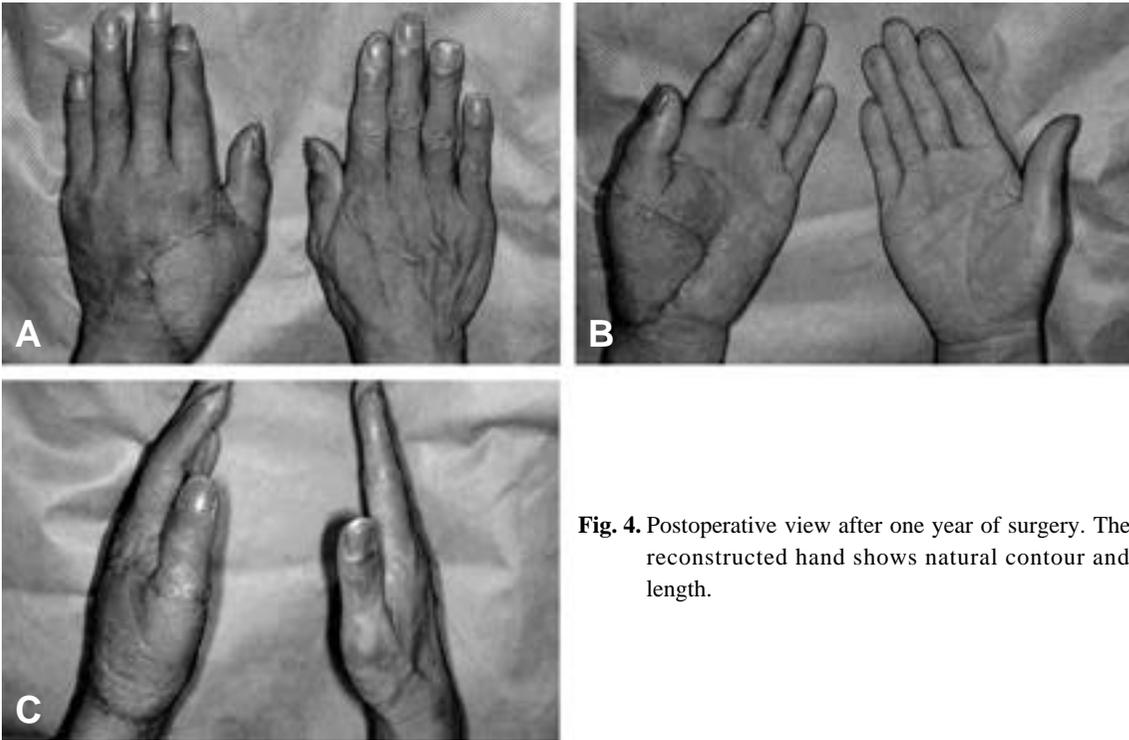
**Fig. 2.** Radiograph of injured hand. Note the total loss of the 1<sup>st</sup> metacarpal and trapezium. The 2<sup>nd</sup> metacarpal and trapezoid were partially remained. Defects of the metacarpal bones were 6.5cm in first and 5.5cm in second.



**Fig. 1-A.** The 9 x 11cm sized crescent composite tissue defect was noted including soft tissues, metacarpal bones and carpal bones. **B.** dorsal view.



**Fig. 3-A.** Intraoperative view of harvested osteocutaneous fibular free flap. The skin flap was 11 × 14cm in size and bone flap was 14cm in length. A 2cm sized middle segment was discarded for smooth angulation. **B.** Insetting of the flap, The peroneal artery was anastomosed between the princeps pollicis artery and proximal palmar arch with flow-through technique.



**Fig. 4.** Postoperative view after one year of surgery. The reconstructed hand shows natural contour and length.

(Fig. 4),

(Fig. 5).

3,10,14,15,17)

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**Fig. 5.** Radiograph of the hands. Note the similar total length of the 1<sup>st</sup> and 2<sup>nd</sup> metacarpal bone compared with the uninjured side.

## REFERENCES

- 1) Anthony JP, Ritter EF, Young DM and Singer MI : *Enhancing fibular free flap skin island reliability and versatility for mandibular reconstruction.* *Ann. Plast. Surg.* 31:106, 1993.
- 2) Anthony JP, Rawnsley JD, Benhaim P et al : *Donor leg morbidity and function after fibula free flap mandible reconstruction.* *Plast. Reconstr. Surg.* 96: 146, 1995.
- 3) Boyd JB, Rosen I, Rotstein LE et al : *The iliac crest and the radial forearm flap in vascularized oro - mandibular reconstruction.* *Am. J. Surg.* 159:301, 1990.
- 4) Buncke HJ : *Fibular osteocutaneous flap: Anatomic study and clinical application(Discussion).* *Plast. Reconstr. Surg.* 78:200, 1986.
- 5) Hidalgo DA : *Fibular free flap: A new method of mandible reconstruction.* *Plast. Reconstr. Surg.* 84: 71, 1989.
- 6) Hidalgo DA : *The osteocutaneous free flap: Is the skin paddle reliable?(Discussion).* *Plast. Reconstr. Surg.* 90:797, 1992.
- 7) Hidalgo DA : *Fibula osteoseptocutaneous flap for reconstruction of composite mandibular defects(Discussion).* *Plast. Reconstr. Surg.* 93:305, 1994.
- 8) Jones NF, Monstrey S and Gambier BA : *Reliability of the fibular osteocutaneous flap for mandibular reconstruction: Anatomical and surgical confirmation.* *Plast. Reconstr. Surg.* 97:707, 1996.
- 9) Jones NF, Swartz WM, Mears DC, Jupiter JB and Grossman A : *The "double barrel" free vascularized fibular bone graft.* *Plast. Reconstr. Surg.* 81:378, 1988.
- 10) Jewer DD, Boyd JB, Manktelow RT et al : *Orofacial and mandibular reconstruction with the iliac crest free flap: A review of 60 cases and a new method of classification.* *Plast. Reconstr. Surg.* 84:391, 1989.
- 11) Schusterman MA, Reece GP, Miller MJ and Harris S : *The osteocutaneous free flap: Is the skin paddle reliable?(Discussion).* *Plast. Reconstr. Surg.* 90: 787, 1992.
- 12) Shpitzer T, Neligan P, Boyd JB, Gullane PJ, Gur E and Freeman JE : *Leg morbidity and function fol -*

- lowing fibular free flap harvest. *Ann. Plast. Surg.* 38:460, 1997.
- 13) Shpitzer T, Neligan PC, Gullane PJ et al : *Oromandibular reconstruction with the fibular free flap: Analysis of 50 consequent flaps.* *Arch. Otolaryngol. Head Neck Surg.* 123:939, 1997.
  - 14) Soutar DS, Scheker LR, Tanner NSB and McGregor IA : *The radial forearm flap: A versatile method for intra-oral reconstruction.* *Br. J. Plast. Surg.* 36:1, 1983.
  - 15) Swartz WM, Banis JC, Newton ED, Ramasastry SS, Jones NF and Acland R : *The osteocutaneous scapular flap for mandibular and maxillary reconstruction.* *Plast. Reconstr. Surg.* 77:530, 1986.
  - 16) Taylor GI, Miller GD H and Ham FJ : *The free vascularized bone graft.* *Plast. Reconstr. Surg.* 55:533, 1975.
  - 17) Wei FC, Chen HC, Chuang CC and Noordhoff MS : *Fibular osteoseptocutaneous flap: Anatomic study and clinical application.* *Plast. Reconstr. Surg.* 78:191, 1986.