

# Novel Local Full-Thickness Skin Grafts for Closure of Free Fibular Osteocutaneous Flap Donor Sites

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**Purpose:** The fibular flap donor site after skin paddle harvest is usually covered with abdominal full-thickness skin grafts. However, this kind of skin graft creates an inevitable third operative area and additional esthetic damage. The aim of this report was to present a novel approach to manage fibular donor site defects using a full-thickness skin graft from the adjacent area and avoid further esthetic damage in a third area.

**Materials and Methods:** Seventeen patients underwent mandibular and maxillary defect reconstruction using free fibular osteocutaneous flaps and the fibular donor-site defects were covered with full-thickness skin grafts from the adjacent area. The skin harvesting sites were closed primarily.

**Results:** The skin donor sites were closed without dehiscence in all cases. Fifteen full-thickness skin grafts survived completely, whereas 2 grafts were partial failures. There were no complete skin graft losses. All fibular osteocutaneous flaps were viable, and the recipient sites had no complications.

**Conclusions:** This study shows that adjacent full-thickness skin grafts provide a straightforward and reliable technique for closure of the free fibular osteocutaneous flap donor site. The primary advantage of this technique is the avoidance of a third surgical site, an additional surgical scar, and subsequent additional esthetic impairment.

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The free fibular osteocutaneous flap is a versatile flap and the preferred option for the reconstruction of head and neck defects, including bone and soft tissue defects.<sup>1-3</sup> The donor site after harvesting the skin paddle for reconstruction of oral mucosal or skin defects can be closed primarily or covered with a full-thickness skin graft (FTSG).<sup>2</sup> Direct closure is possible only for a smaller defect and a skin graft is necessary for a larger defect, which is usually harvested from the abdominal area.<sup>2,4</sup> However, this kind of skin graft creates an inevitable third operative area and additional esthetic impairment.<sup>2,4</sup>

Some techniques have been reported to avoid the additional impairment. Split-thickness skin graft (STSG) harvesting from the expected fibular osteocutaneous paddle eliminates the morbidity of a secondary donor site.<sup>5</sup> Open healing of the fibular donor site aided by meshing avoids the morbidity associated with a graft and results in a superior final cosmetic result.<sup>6</sup> However, in the authors' experience, FTSGs are more suitable for fibular donor-site defects and result in superior cosmetic effects. The authors propose harvesting FTSGs in adjacent cutaneous areas to avoid a third surgical scar and to decrease the

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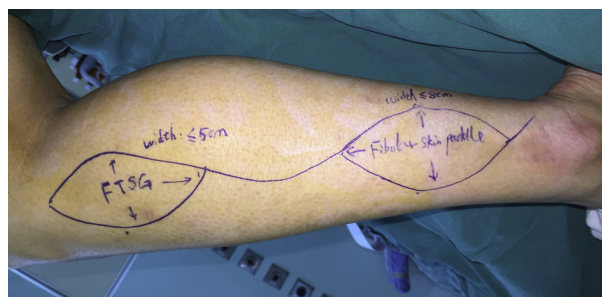
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esthetic deformity. The present report describes the authors' experiences in the closure of free fibular osteocutaneous flap donor sites using FTSGs from adjacent cutaneous areas.

## Materials and Methods

From October 2013 to December 2014, 17 patients underwent free fibular osteocutaneous flap harvesting for maxillary or mandibular reconstruction, and the fibular donor site defects were closed by FTSGs derived from the adjacent cutaneous area. This study was approved by the research ethics committee of Sun Yat-sen Memorial Hospital, Sun Yat-sen University (Guangzhou, China). The patients consisted of 11 men and 6 women with a median age of 49 years (range, 24 to 71 yr). They included 5 cases of mandibular osteoradionecrosis, 5 cases of mandibular adamantoblastoma, 4 cases of gingiva carcinoma, 1 case of intraosseous carcinoma of the mandible, 1 case of maxillary sarcoma, and 1 case of maxillary osteofibroma. The clinical data for these patients are presented in Table 1.

An S-shaped incision was performed to harvest the fibular osteocutaneous flap in the lower limb and a



**FIGURE 1.** Preoperative design of the harvest of a free fibular osteocutaneous flap and an FTSG with a moderate-sized skin island. The FTSG was obtained from the incision area adjacent to the knee. FTSG, full-thickness skin graft.

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spindle-shaped FTSG in the proximal incision adjacent to the knee (Fig 1). The fibular flap paddle was adjusted depending on the perforators, and the fibular flap was used to reconstruct the jaw. The FTSG was designed based on the size of the skin paddle of the free fibular osteocutaneous flap. The length was approximately 30% shorter and the width was approximately 20% narrower (Fig 1). In all cases, the FTSG was narrower than 5 cm and the sequential width of the

**Table 1. DEMOGRAPHIC DATA FOR 17 PATIENTS AND RESULTS FOR CLOSURE OF FIBULAR DONOR SITES WITH FTSGS**

Patient Number	Gender	Age (yr)	Disease	Size of Fibular Skin Flap (cm)	Size of FTSG (cm)	Clinical Outcome	Follow-Up (mo)
1	Male	45	Osteoradionecrosis	12 × 5	8 × 4	Primary healing	14
2	Male	54	Gingival carcinoma	7 × 4	5 × 3	Primary healing	10
3	Male	22	Osteosarcoma	8 × 5	6 × 3	Primary healing	6
4	Female	34	Gingival carcinoma	8 × 5	5 × 3	Primary healing	8
5	Male	59	Gingival carcinoma	6 × 4	4 × 3	Primary healing	7
6	Male	58	Osteoradionecrosis	15 × 8	8 × 5*	Secondary healing after 12 days of wound care	10
7	Female	36	Osteofibroma	7 × 5	5 × 4	Primary healing	12
8	Male	71	Adamantoblastoma	8 × 4	5 × 3	Primary healing	18
9	Male	65	Gingival carcinoma	9 × 4	6 × 3	Primary healing	14
10	Female	43	Osteoradionecrosis	10 × 6	7 × 4.5	Primary healing	8
11	Male	29	Adamantoblastoma	10 × 4	7 × 4*	Secondary healing after 15 days of wound care	9
12	Female	55	Adamantoblastoma	8 × 4	6 × 3	Primary healing	11
13	Female	59	Intraosseous carcinoma	8 × 5	6 × 4	Primary healing	14
14	Male	58	Osteoradionecrosis	12 × 5	8 × 4	Primary healing	10
15	Female	36	Adamantoblastoma	8 × 4	6 × 3	Primary healing	12
16	Male	43	Osteoradionecrosis	14 × 6	8 × 5	Primary healing	16
17	Male	65	Adamantoblastoma	8 × 5	7 × 4	Primary healing	15

Abbreviation: FTSG, full-thickness skin graft.

\* Partial failures of FTSG after removal of dressing.

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