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## Case Report

# ANTEROLATERAL THIGH FLAP

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### Abstract

A 64-year-old Japanese male had a squamous cell carcinoma (T4N1M0) in the left gingival and buccal mucosa, so a radical wide resection involving left radical neck dissection was performed. An anterolateral thigh flap measuring 15 × 8 cm was raised from the left thigh and transferred to the defect. The postoperative course was eventful. There was no postoperative flap necrosis, infection, not even a cervical fistula.

Key words: Microsurgery—Oral reconstruction—Anterolateral thigh flap—  
Extensive defect—Morbidity

### CASE REPORT

The patient was a 64-year-old Japanese male with a squamous cell carcinoma (T4N1M0) that originated in the left buccal mucosa and infiltrated to the mandible and buccal skin of the left side (Fig. 1). He underwent a wide excision of the posterior maxilla, the part of mandible, the buccal mucosa, and the floor of the mouth, a pharyngectomy and left neck dissection, including the overlying buccal skin.

A large anterolateral thigh flap, measuring 15 × 8 cm was obtained simultaneously with the tumor resection in order to facilitate soft tissue reconstruction. At first, we reconstructed the mandible using mandibular reconstruction plate for internal stabilization of the remaining mandibular segments. The large

soft tissue defects of the intraoral and facial regions were reconstructed with the anterolateral thigh flap. The buccal defect was repaired with a folded medial portion of the skin flap to build the bulkiness of the cheek prominence.

The first incision was made through the longitudinal line at the middle of the anterior aspect of the thigh (Fig. 2). The lateral skin was elevated through the incision with a pair of retractors, and the septocutaneous or muscle perforating artery was visualized. After confirming the location of the pedicle perforator, the skin flap was outlined to include the perforator on the anterolateral thigh region. After raising the whole skin flap and transecting several muscle branches from the lateral circumflex femoral system, the pedicle

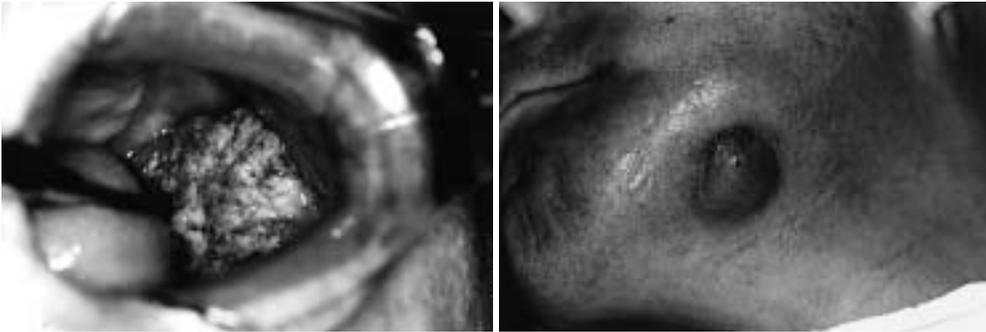


Fig. 1 A 64-year-old man with an extensive squamous cell carcinoma of the left buccal mucosa and left skin.

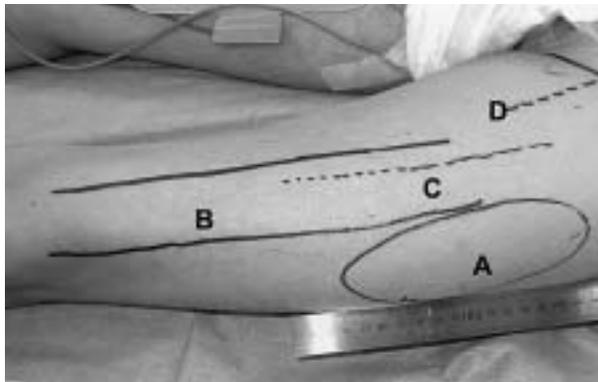


Fig. 2 The design of the anterolateral thigh flap is marked on the right thigh.  
A: Thigh flap, B: Rectus femoris muscle,  
C: Incision line, D: Deep femoral artery



Fig. 3 Defect after resection of squamous cell carcinoma on the left side of the face.  
\*: anterolateral thigh flap

was dissected proximally from the descending branch up to the proximal end of the lateral circumflex femoral vessels. The branch of the

femoral nerve running parallel or across this vascular system must be carefully separated from the vascular pedicle.

Vascular anastomoses of the lateral circumflex femoral artery to the facial artery and the venae comitantes of the lateral circumflex femoral artery to the one branch of the facial vein were constructed (Fig. 3).

The postoperative course was uneventful. There was no skin flap necrosis of the facial or intraoral regions, which would have caused intraoral exposure of the plate or an external cervical fistula. Three months after the surgery, his facial appearance had improved, and there was no recurrence of the tumor (Fig. 4). There was complete healing at the donor site with no functional limitation of the donor leg.

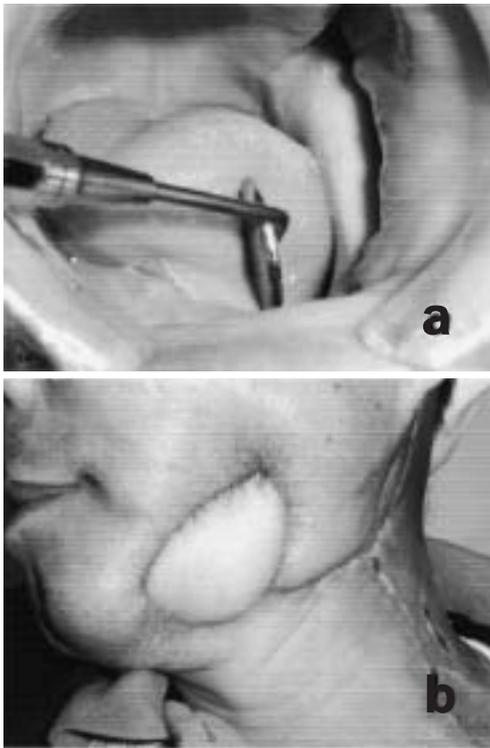


Fig. 4 Three months after operation. Result of coverage of the defect with an antero-lateral thigh flap. a: intraoral feature, b: buccal skin

ANATOMIC DESCRIPTION

The lateral circumflex femoral system is composed of three main branches: the ascending branch, which passes through the intermuscular space between the sartorius muscle and the vastus lateralis muscle; the transverse branch, which terminates in the tensor fasciae latae muscle; and the descending branch, which runs downward through the intermuscular space between the rectus femoris muscle and the vastus lateralis muscle and finally terminates in the vastus muscle near the knee joint<sup>1,4)</sup> (Fig. 5). The perforator of the lateral thigh flap is usually derived from the transverse branch and the descending branch, and the proximal perforator is situated around the proximal one-third of the thigh through the lateral longitudinal line of the thigh (Fig. 6). This perforator site corre-

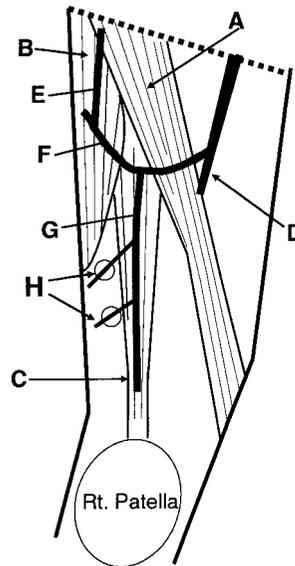


Fig. 5 Schematic drawing of the right lateral circumflex femoral system, which is composed of three main branches: the ascending branch (E), the transverse branch (F), the descending branch (G), and the perforators (H). A: Sartorius muscle, B: Tensor fasciae latae muscle, C: Rectus femoris muscle, D: Deep femoral artery



Fig. 6 Cadaver dissection demonstrating the connection of the cutaneous branch of the perforating artery to the anterolateral thigh flap. \*: Vastus lateralis, \*\*: descending branch from the lateral circumflex femoral system, \*\*\*: Perforators

sponds to the intermuscular space between the rectus femoris muscle and the vastus lateralis muscle. Usually, a few cutaneous perforators can be seen passing through the intermuscular septum and the vastus lateralis

muscle. Even in the cases with no septocutaneous perforators, there were perforators penetrating the vastus lateralis muscle.

## DISCUSSION

The numerous advantages of microsurgical tissue transfer for maxillofacial reconstructions are offset by highly complicated techniques that involve taking a lot of operating time and the creation of donor defects<sup>2,6,9</sup>. The choice of the microsurgical transplant has a decisive role in how negative an effect these disadvantages will have. Popular reconstructive methods for defects in head and neck regions are free vascularized intestinal interpositioning, the radial forearm flaps, and the rectus abdominis musculocutaneous flap<sup>2</sup>. However, the use of the radial forearm flap is limited in some cases, because complaints of cosmetic problems with the donor scar can arise<sup>6</sup>. When a radial forearm flap is used, an extensively wide defect cannot be repaired because the size of the forearm flap is limited. The rectus abdominis musculocutaneous flap may be unsuitable for reconstruction of defects involving relatively small amounts of tissue because the flap is very bulky<sup>2</sup>. In cases in which it is difficult to use these popular tissue transfers, the anterolateral thigh flap may be suitable.

The anterolateral thigh is a septocutaneous artery flap based on the septocutaneous or muscle perforators of the lateral circumflex femoral system. This flap is a suitable donor region, but it is still little used in maxillofacial surgery<sup>1,7,8</sup>. Recent studies have demonstrated the advantages of the anterolateral thigh flap to be the following: 1) elevation is easy because there are several perforators deriving from the descending branch of the lateral circumflex femoral system, 2) the diameter of vascular pedicle is approximately 2 mm, 3) the flap is potentially sensate because the lateral femoral cutaneous nerve can be used, 4) the skin territory of the anterolateral thigh flap is very long and wide (about 25 cm long and 18 cm wide), 5) the donor is far from the

head and neck regions, and 6) the donor site is hidden and therefore more acceptable to the patient<sup>3,4</sup>. The disadvantages of this flap are: 1) The anatomy of the pedicle vessels is irregular, 2) the flap has hair follicles in male patients, and 3) a large flap will result in a significant donor scar owing to skin grafts<sup>3</sup>.

The anterolateral thigh flap seems to be suitable for the coverage of defects that require a thin and relatively large mobile flap, especially for defects in the head and neck regions<sup>5</sup>. Indications for this flap are application in the management of deep, extensive facial skin defects, such as those of the buccal mucosa and skin.

In conclusion, we believe that the anterolateral thigh flap is suitable material for the reconstruction of extensive defects of the head and neck.

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