Anterior Tibial Artery Perforator Flap for Reconstruction of Intraoral Defects

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Purpose: The present clinical study assessed the feasibility of using an anterior tibial artery perforator (ATAP) flap for the reconstruction of an intraoral defect after ablative surgery for oral cancer.

Patients and Methods: A cohort of consecutive patients with oral cancer requiring reconstruction of an intraoral defect using an ATAP flap were enrolled after ablative surgery for oral cancer and ipsilateral neck dissection.

Results: Twelve patients had primary oral squamous cell carcinoma (8 with tongue cancer and 4 with buccal cancer). All patients received intraoral defect repair using an ATAP flap from the lower left leg. The flap measured 7×4 to 8×6 cm^2. Flap thickness was approximately 4.8 mm (3 to 6 mm). Anastomosis of all ATAP flaps was straightforward because of the long and high-caliber vessel pedicle. All flaps survived and yielded excellent esthetic results for intraoral reconstruction. No major complications occurred in any patient.

Conclusion: The main advantages of the ATAP flap included the thin and pliable tissue characteristics and a long and high-caliber pedicle. For small and medium-size intraoral defects, the ATAP flap is a reliable alternative to the radial forearm free flap.

J Oral Maxillofac Surg 72:804-810, 2014

To optimally reconstruct an intraoral soft tissue defect by a free flap, the flap should be relatively thin and pliable to provide the best replacement for the soft and mobile oral mucosa.[1,2] Moreover, its vessel pedicle should be long enough with adequate caliber for vascular anastomosis, because commonly the recipient vessels (the facial artery or superior thyroid artery as the recipient artery and the external jugular vein or branches of the internal jugular vein as the recipient vein) in the head and neck have a large diameter and are distant from intraoral defects.

Although the radial forearm (RF) free flap has the thin and pliable characteristics and a long and high-caliber pedicle, its harvesting leaves an unsightly and conspicuous scar at the donor site and results in some potential complications in the upper limb because of scarification of an important vessel of the forearm.[3-5] The anterolateral thigh (ALT) free flap, as a 4-season flap, is unsuitable for obese patients owing

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This work was supported by the National Natural Sciences Foundation of China (grant 81000445), the Foundation of the Department of Science & Technology of Hunan Province in China (grant 2010TD2023), and the State Key Specialist Construction Projects of China.

Conflict of Interest Disclosures: None of the authors reported any disclosures.

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Received June 27 2013

Accepted October 29 2013

0278-2391/13/01412-2$36.00/0

http://dx.doi.org/10.1016/j.joms.2013.10.025

to excessive subcutaneous fat in the thighs, which requires a flap-thinning procedure to achieve good results.[6-8] However, the thinning procedure requires a high degree of technical skill and exact knowledge of the vascular anatomy to avoid accidental perforator injuries.[9,10] Acceptance of a jejunal graft is restricted by its vulnerable mucosa and possible postoperative complications, including adhesion-induced ileus, abdominal wall dehiscence, peritonitis, or hernias.[11] Except for total tongue reconstruction, the rectus abdominis musculocutaneous flap is not preferred for intraoral reconstruction owing to its bulky volume.[12] The lateral upper arm free flap is always thin and pliable; however, the small vessel diameter, short pedicle length, deep location of the pedicle, and close relation to the radial nerve are major disadvantages.[13,14] Other free flaps proposed for intraoral lining have their limitations. Therefore, there is no gold standard for the reconstruction of an intraoral soft tissue defect by a free flap.

The choice of a free flap type must be made after taking into account the anatomic and functional characteristics of the tissue removed, the recipient and donor sites, the patient's general condition, and the experience of the surgeon. This report describes the authors' successful clinical application of a reliable free flap, the anterior tibial artery perforator (ATAP) free flap, with a long and high-caliber pedicle, for intraoral reconstruction. The ATAP flap results in an inconspicuous scar and minimal functional consequences to the donor site.

Patients and Methods

From July 2012 to March 2013, the free ATAP flap was used to reconstruct intraoral soft tissue defects

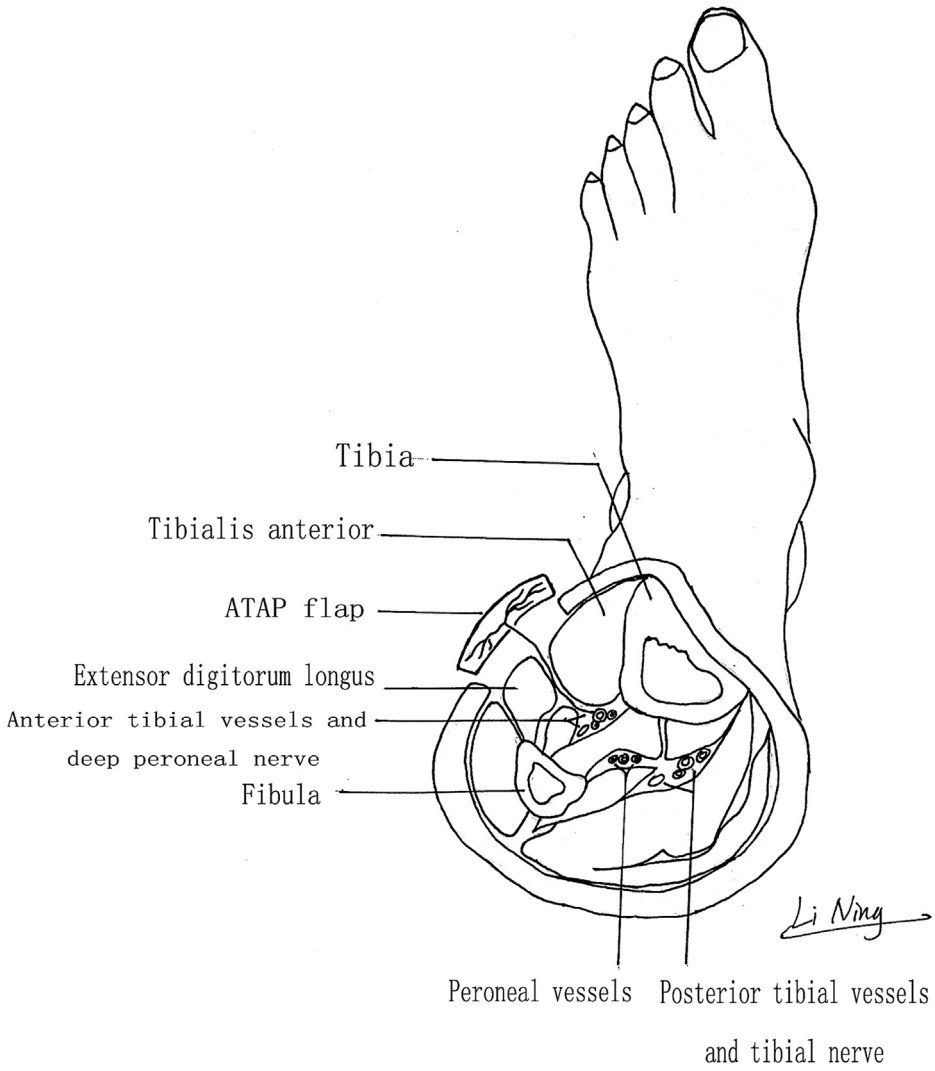

FIGURE 1. Anatomy of the ATAP flap and its surrounding structures. ATAP, anterior tibial artery perforator.

Wang et al. Anterior Tibial Artery Perforator Flap. J Oral Maxillofac Surg 2014.