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Review

Maxillary artery based flaps for oral cavity reconstruction, a review

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HIGHLIGHTS

- Flaps based on maxillary artery branches can be used for oral cavity reconstruction but there is any review in this topic.
- Seven soft tissue flaps based on the maxillary artery branches are available.
- Flaps based on the maxillary artery branches are strongly recommended when the facial artery has been ligated/sacrificed.
- Soft tissue flaps derived from maxillary artery, can be used for facial reconstruction even after radiotherapy to the face.
- Face lymphatic is always along the facial vein, so maxillary artery based flaps are oncological safe flaps.

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ABSTRACT

Background: There are different flaps based on the branches of the maxillary artery. Flaps based on the maxillary artery branches can be used for oral cavity reconstruction in selected cases, but there is lack of comprehensive review in this topic.
Methods: A literature review was performed on Medline for maxillary artery based flaps and oral cavity reconstruction. Surgical techniques for each possible variant of maxillary artery based flaps and an example of each situation for oral cavity reconstruction is explained.
Result: Five variants of soft tissue flaps based on maxillary artery branches are presented. Some of them such as temporal flap, superiorly based masseter flap, palatal flap and posteriorly based buccinator myomucosal flap are famous flaps, while posteriorly based inferior turbinate flap is less noticed for oral cavity reconstruction. Nasoseptal and infraorbital based flaps are two other maxillary artery based flaps but have no role in oral cavity reconstruction.
Conclusion: Maxillary artery based flaps should be considered as an option especially in previously radiotherapy/surgically operated patients with facial vessels sacrifice.

Contents

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1. Introduction

Axial pattern pedicled flaps, uses the tissue with guaranteed blood supply, by including a named artery in flap base and along the flap length [1]. Maxillary artery is deeply located in the face, so remains intact for vascularization of the face even in the case of neck dissection and radiotherapy [2]. Flaps based on the maxillary artery branches can be used for orofacial reconstruction in selected cases, but there is lack of comprehensive review in this topic. Facial artery nourishes the face from the anterior direction and is correlated with blood supply of expression muscles. End branches may penetrate facial bones while maxillary artery nourishes the face deeply and contains nutrient vessels of masticator muscles and jaw bones. These two arteries anastomose with each other extensively. Maxillary artery branches are often accompanying with sensory nerve branches of maxillary or mandibular nerves, so pedicled flaps based on these arteries are neurovascular flaps with benefits of sense perceptions if there is no plan to do pedicle division. In this article, all possible variants of the soft tissue flaps based on the maxillary artery branches, are presented.

2. Material and methods

A literature review was performed on Medline for maxillary artery based flaps and oral cavity reconstruction. Surgical techniques, possible variants of maxillary artery based flaps; Indications, limitations and oncologic safety of these flaps were focused on. Authors experience with these flaps also is presented.

3. Result

Five variants of soft tissue flaps based on maxillary artery branches with an example for each situation are presented:

The patient was 55 year old male patient with post trauma palatal fistula adjacent to the right maxillary posterior edentulous space. Nasal side coverage was obtained from palatal turn over flaps. Posteriorly based buccinator myomucosal flap was used for oral side coverage (Fig. 1). Boundaries of this flap was one centimeter behind oral commissure anteriorly, beneath stensen duct superiorly and above mucobuccal fold inferiorly. Depth of dissection was just below the buccinator muscle.

The patient was 40-year female patient with maxillary odontogenic myxoma in left upper quadrant that had perforated cortical plates and invaded to soft tissue. Posteriorly based inferior turbinate flap was used for one-layer closure of palatal fistula from nasal side after surgical resection of pathologic lesion (Fig. 2). Inferior turbinate bone was removed from flap. Raw surface was faced toward the nasal cavity and flap boundaries were sutured to palatal and buccal mucosa edge to edge.

The patient was 68 year old male patient with mandibular ameloblastoma that had invaded to the soft tissue mucosa in retromolar region. Lateral mandibular defect with soft tissue loss was reconstructed with titanium reconstruction plate covered with the whole palatal mucosa, pedicled on the left greater palatal artery. Crestal incision was used in this edentulous patient and palatal mucosa was reflected in full thickness. Pivotal point of this flap was considered in left greater palatine foramen area. Incisive vessels as well as right greater palatine artery were ligated. This flap was rotated 180° to cover the soft tissue defect (Fig. 3). Donor site healing was slow but uneventful.

The patient was 60 year old male patient with large oronasal fistula resulted from resection of the maxilla in posterior region. Hemicoronal incision was used to get access to temporal muscle. This muscle and overlying fascia was elevated from temporal fossa attached only to coronoid process. Temporal flap was harvested and anterior part was used for palatal reconstruction. Posterior half was transposed anteriorly to prevent temporal hallowing (Fig. 4).

The patient was 55 year female with buccal mucosa squamous cell carcinoma, extended to the mandibular alveolar ridge. After surgical resection with wide margins, the resected mucosa was reconstructed with superiorly based masseter flap (Fig. 5). Inferior head of masseter muscle was detached from mandibular bone by blunt end of a periosteal elevator. Outer surface of this muscle was dissected from overlying tissue by long beaked hemostat.

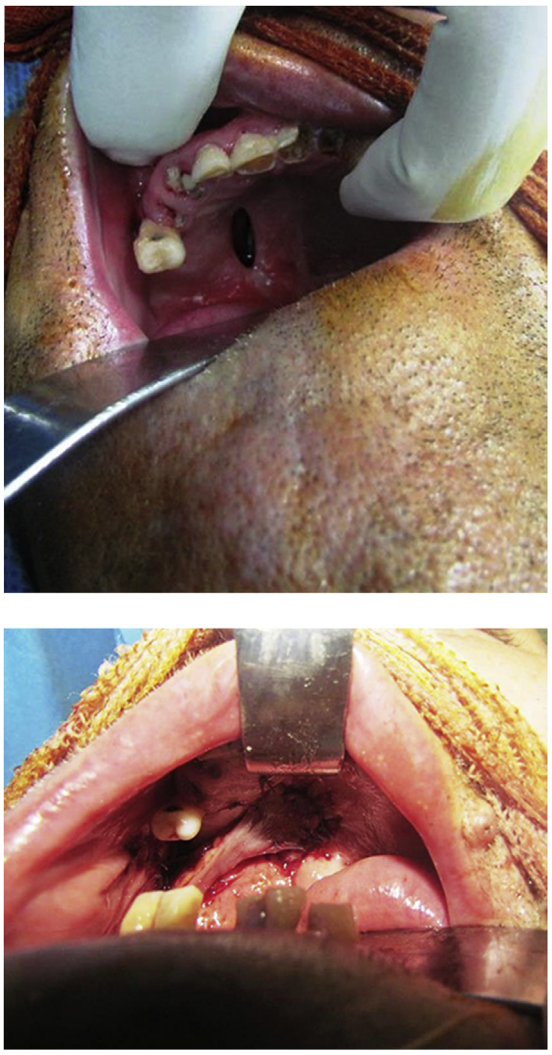

Fig. 1. a) Palatal fistula from palatal fracture in a trauma patient. b) Posteriorly based buccinator myomucosal flap is used for reconstruction. This flap needs pedicle division.