

ORIGINAL PAPER

New Method for Maximum Mobilization of Temporalis Muscle Flap

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Introduction: Pedicled temporalis muscle flap presenting a good flap for closing large craniofacial defects. Careful surgeons usually do not mobilize temporalis muscle flap enough to make appropriate use, fully closure, especially if defect exceeds the median line. **Patients and methods:** Temporalis flap was used in 16 patients, ages ranged between 12 and 76. In all cases defect reconstruction was done by using new method of extending standard temporal muscle flap. During surgical procedure it is very important to keep periosteal elevator in close contact with the bone. Then, there is no risk for pedicle injury. After vascular pedicle is identified elevating temporal muscle has to be continued by releasing the muscle insertion from the coronoid process. By this way, flap length and arc of rotation is increased. **Results:** The flap remained viable in all instances. Most of the patients experienced no perioperative complications. There was no major complications or mortality as a result of performed procedures. **Conclusion:** With this division, flap length was increased at least 2 cm which is enough for covering defects crossing the midline. Instead of using bilateral temporalis muscle flaps for defect closure, unilateral is sufficient. With this extension of the pedicle length now rotation point is not at the level of the zygomatic arch but lower part mandibular neck. **Key words: temporalis muscle flap, maximum mobilization, craniofacial defects.**

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1. INTRODUCTION

Pedicled temporalis muscle flap, because of its rich vascular network, presents a good flap for closing craniofacial defects (of the forehead, anterior skull base, orbital defects, unilateral or bilateral partial or total maxillectomy, after removal of the hard palate, intra-oral defects, reconstruction of tongue and floor of mouth defects) (1, 2, 3, 4). Standard flap has rotation point at the level of the zygomatic

arch could be removed temporary, and flap's arc of rotation will be extended. Reverse flap theoretical could be based on the minor pedicles, but this has no practical value (1). In many cases temporal muscle flap is insufficiently long and massive to close large defects (5, 6). In this article is presented a new method of increasing length and arc of rotation with or without resection of zygomatic arch.

2. PATIENTS AND METHODS

2.1. Patients

Temporalis flap was used in 16 patients, ages ranged between 12 and 76. Reconstruction was done for various

Case	Age	Sex	Pathological Diagnosis	Defects
1	14	Female	Rhabdomyosarcoma	Orbital exenteration and partial maxillectomy
2	32	Female	Osteosarcoma	Total maxillectomy
3	62	Male	Recurrent squamous cells carcinoma	Hemimaxillectomy and complete removal of the hard palate from the opposite side)
4	54	Female	Osteosarcoma	Total maxillectomy
5	76	Male	Osteosarcoma	Radical maxillectomy defects
6	12	Female	Rhabdomyosarcoma	Orbital exenteration of the left side
7	65	Female	Squamous cell carcinoma	Partial maxillectomy
8	68	Male	Adenocarcinomas	Partial maxillectomy
9	72	Male	Squamous cell carcinoma	Floor mouth defect
10	59	Male	Recurrent squamous cell carcinoma	Composite soft tissue and maxillectomy defect
11	58	Female	Adenoid cystic carcinomas	Partial maxillectomy
12	48	Male	Osteomyelitis	Orbital bones
13	66	Male	Recurrent squamous cell carcinoma	Partial maxillectomy
14	65	Male	Adenoid cystic carcinoma	Total Maxillectomy
15	59	Male	Mucoepidermoid carcinoma (low grade)	Complete unilateral removal of the hard palate
16	74	Male	Recurrent squamous cell carcinoma	Large defect of forehead (dura exposed), orbita and maxilla.

TABLE 1: Patients data and pathology.



FIGURE 1. Defect and marking



FIGURE 2. Scalp elevation

soft-tissue and/or bony facial defects. The data of these patients are presented in Table (1). Diagnosis were determined by preoperative pathological examination of an incisional biopsy. Localization and expansion of tumors were specified by computerized tomography and magnetic resonance imaging. All 16 cases presented in this article has defect reconstruction by using a method of maximum mobilisation of standard temporal muscle flap.

2.2. Surgical technique

After preoperative marking, coronal incision was made. Elevating scalp, superficial layer of the deep temporal



FIGURE 3. Muscle dissection



FIGURE 4. Elevated muscle



FIGURE 5. Mild depression



FIGURE 6. Postoperative view

fascia is exposed till margins of temporal fossa. Intraoperative marking of temporalis muscle was made. Incision along marked line was done through the fascia and muscle. Periosteal elevator was used to separate the muscle from the deep surface of the zygomatic arch. Muscle dissection from temporal fossa was done sharply with a periosteal elevator, in caudal direction to the infratemporal fossa.

It is important to pay attention to keep periosteal elevator in close contact with the bone and elevating periosteum with deep layer of the deep temporal fascia and temporalis muscle. Then, there is no risk for pedicle injury. On the level of zygoma, the deep surface, vascular pedicle was identified. Elevating temporal muscle was continued by releasing the muscle insertion from the coronoid process (elevator was kept in close contact to the bone). By this way, dissecting muscle by its insertion to the mandible, flap length and arc of rotation was increased.

3. RESULTS

The flap remained viable in all instances. Most of the patients experienced no perioperative complications. Two patients with flaps transposed to the oral cavity showed partial wound dehiscence. One patient has a minor partial flap loss requiring debridement.

Speech and swallowing after closure of intraoral defects and separation of the oral from the nasal cavity was satisfactory. All patient had mild depression of the temporal fossa, and six had mild to severe alteration in the facial aesthetics. All flaps transposed to the oral cavity showed good epithelialization and adaptation to the recipient site.

4. CONCLUSION

Dissection of the temporalis muscle from its insertion on coronoid process was described by Mathew and Nahai as a rare used technique with approach to the coronoid process through intraoral incision (1, 9). Careful surgeons usually do not mobilize temporalis muscle flap enough to make appropriate use, fully closure, especially if defect exceeds the median line (7, 8). To achieve closure on the contralateral side it is necessary to mobilize the maximum. This is accomplished by division of the insertion into the coronoid process. Approach to the coronoid process in this study was made in from temporal and infratemporal fossa to caudal direction. With this division, flap length was increased at least 2 cm which is enough for covering defects crossing the midline. Instead of using bilateral temporalis muscle flaps for defect closure, unilateral is sufficient. With this extension of the pedicle length now rotation point is at the level of the lower part mandibular neck. There was no major complications or mortality as a result of performed procedures.

Conflict of interest: none declared.

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