The use of the temporalis muscle flap in facial and craniofacial reconstructive surgery. A review of 182 cases

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SUMMARY. The authors report on their 16-year experience of reconstruction with the temporalis myofascial flap in 182 cases.

All aspects of reconstructive cranio-maxillofacial surgery are covered: trauma, deformities, tumours, TMJ ankylosis, facial paralysis.

The temporalis myofascial flap was used both as a single and as a composite flap with cranial bone, coronoid process or skin island.

Major complications were not observed.

On the basis of their experience, the authors confirm the reliability, versatility and reproducibility of the use of this flap. This is due both to its rich blood supply and to its proximity to the reconstruction site.

It is suggested that the use of the temporalis muscle flap should be taken into consideration before deciding on more extensive reconstructive procedures.

INTRODUCTION

The temporalis muscle flap (TMF) started to be utilized towards the end of the 19th century and found extensive application in many fields of maxillofacial surgery, either as the only component of the flap or as a portion of a composite flap. The history of surgical restoration of the facial and craniofacial area with TMF goes back about 100 years.

As early as 1872, Verneuil described the use of the posterior temporalis muscle flap in interposition arthroplasty in TMJ ankylosis.

In 1889, the neurosurgeon Wagner used an osteomuscular temporoparietal flap, as a TMF application, following craniotomy for intracranial tumours. With this technique the bone was vascularized by the deep temporal arteries through the temporalis muscle.

Golovine (1898) is considered the first surgeon to have employed the TMF for orbital reconstruction. Although a careful reading of his manuscript reveals that he used only a temporal skin flap, and not the temporalis muscle. This misconception has been maintained throughout the present century.

Lexer (1908) and Rosenthal (1916) utilized the TMF to reanimate the eyelid following paralysis of the facial nerve, by reinserting a well-innervated 'strip' of this muscle into the paralyzed orbicular muscle.

Gillies (1920) employed the muscle to restore the cheek contour. König (1926) reported on its use in repairing defects following the excision of tumours of the middle third of the face.

In 1935 Sheehan introduced osteotomy for the temporary removal of the zygomatic arch, thereby enhancing the possibility of TMF mobilization and rotation.

Campbell (1948), utilized the flap to repair post-maxillectomy defects. Naguin (1956), and Webster (1957), used the muscle to fill the orbital cavity.

In 1958, Wise and Baker modified König's technique for the reconstruction of the orbital floor by exclusively using the TMF and by detaching the temporalis tendon from the coronoid.

Rambo (1958) used the TMF for the mastoid and the middle ear area following radical surgery for a chronic suppurative disease.

In 1962, Cramar reported using the TMF to fill the orbital cavity following exenteration.

In 1963, Bakamjian also described using the TMF in the reconstruction of the palate and maxilla in order to correct maxillary defects following tumour resection.

In 1969, Horton reported using the TMF for the reconstruction of the palate and maxilla after tumour resection.

The rapid expansion of and excitement about the use of the TMF goes back to the early 1970s.

At the onset of the 1970s Conley's studies (1972 and 1973) on the clinical applications of the TMF including bone were published. These studies discussed imaging and diagnostic analysis of the histological alterations occurring in transposed bone, thus revealing the varying degrees of vitality of bone with a vascular pedicle. The results of the studies, however, were not considered by the author to be unequivocally in favour of vascularized flaps.

Wilson and Westbury (1973), pointed out the basic principles of craniofacial resections. The authors classified tumours arising within the orbit into three groups and described the use of the TMF in repairing cranial base defects.
In 1974, Tessier reported on the use of the TMF in the treatment of temporomandibular ankylosis. Following resection of the ankylosis, a portion of the TMF was rotated between the glenoid cavity and the mandibular ramus.

At the VI International Congress on Plastic Surgery, held in Paris in 1975, Daver presented reports on 120 patients with lagophthalmos treated with transfer of ‘strips’ of temporal muscle-fascia. At the same Congress, Freeman presented his report on 69 patients, covering a 30-year period. These patients had paralysis of the facial nerve; 27 of them were treated by TMF transposition.

In 1975, Bakamjian and Souther described their use of the TMF on five patients in the treatment of various orbito-maxillary defects following tumour resection. The authors filled the orbit by utilizing the entire temporalis muscle with its fascia and by covering it with a skin graft. In this technique, the TMF was passed through an opening made in the lateral orbital wall. In addition, the authors described the sectioning of the coronoid to achieve TMF mobilization.

Edgerton et al. (1975), presented two cases of Moebius syndrome, which was also reported by Ruben in 1977.

At the 4th EAMFS Congress, Curioni et al. (1978) proposed a new technique for the reconstruction of the orbital floor following radical maxillectomy. In the authors' opinion, the utilization of the TMF with the coronoid improves both function and aesthetics. Nine patients underwent surgery with this technique and the results were published in 1983.

Holmes and Marshall (1979) brought the 1970s literature to a close with their report on TMF employment in blanking out the orbits in five cases. The versatility of the flap, its advantages as well as limitations and complications were discussed.

The 1980s opened up new frontiers to the use of this versatile muscle flap.

At the beginning of the past decade Tessier (1980) summarized the numerous applications of the TMF in cranio-maxillofacial surgery: malformations, trauma and tumours. In particular, he reported in great detail on the surgical technique for reconstructing the anophthalmic socket, as well as on the application of the TMF in the treatment of Romberg's syndrome.

In 1981, Bradley and Brockbank published a cadaveric, animal and clinical study that may be considered a cornerstone in modern TMF literature. According to these authors, it is preferable to osteotomize the coronoid in order to obtain a complete rotation of the flap (135°) and to cover the muscle with a skin graft in order to minimize fibrosis and retraction.

In 1982, Tessier published 14 cases in which the TMF was transposed through the lateral orbital wall for the treatment of the microphthalmic orbit and in intrabulbar neoplasm exenteration with preservation of the eyelids.

Curioni et al. (1984) reported on the possibility of resurfacing the orbital area following extensive orbital exenteration including the eyelids. A TMF incorporating the skin from the lateral non-hair-bearing forehead may be rotated to fill the cavity. The skin island substitutes for the excised eyelids.

In 1984, McCarthy and Zide introduced the concept of a vascularized calvarial bone flap to reconstruct unfavourable sites such as scarred or irradiated beds, or the hypoplastic zygomatico-maxillary complex in the Treacher Collins syndrome. This technique quickly became popular and many authors reported using it in facial and craniofacial reconstruction (Hauben and van der Meulen, 1984; Psillakis, 1984; van der Meulen et al., 1984; Curioni et al., 1986; Grotting et al., 1986; Psillakis et al., 1986; Antonyshyn, 1987; Fasano et al., 1987).

Antonyshyn et al. (1988) have reviewed the use of temporalis flaps in the reconstruction of nine defects in multiple anatomical sites. In the authors' opinion the flap is suitable for repairing both functional and aesthetic composite defects in the cranio-orbital and facial area.

Ewers (1988), reported a new technique of reconstruction of the entire maxilla and palatal mucosa that included a vascularized calvarial bone graft with the TMF from one side combined with the TMF from the other side, with the fascia facing the oral cavity. This technique allows the achievement of a three-layer ‘sandwich’ plasty.

Demas and Soteranos (1989), described the infra-temporal transmaxillary transfer of a temporalis myofascial flap for the reconstruction of an extensive palatal defect in an adult cleft palate patient. The anterior muscle pedicle was transposed into the palatal defect through an opening in the postero-lateral maxillary wall.

In 1990, Brusati et al. described 12 patients presenting TMJ pathology who were treated with transposition of a TMF strip between the bony articular surfaces.

Colmenero et al. (1991), reported their experience gained with 26 temporalis flaps in oncologic cases. The advantages of using this flap as well as the minimal functional and aesthetic sequelae were stressed.

Van der Wal and Mulder (1992), reported closure of large palatal defects in four patients with congenital cleft palate. The anterior part of the muscle was used. In the authors' opinion the procedure is safe and produces good results, especially in the case of patients with extensive scars from previous operations.

Del Hoyo et al. (1994), have evaluated and reviewed 38 cases. Four of the patients received the flap to restore orbital defects. The other 34 flaps were used in oral reconstructions. No major complications were reported. All the flaps transposed into the oral cavity showed good epithelialization and adaptation to the recipient site.

In this report, we present our experience of the use of the TMF, simple or compound, with either calvaria or mandibular coronoid apophysis, or skin island.

The main field of application was the reconstruction of various defects in the craniofacial region following tumour resection. The TMF was also utilized in post-
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trauma reconstruction, congenital deformities, temporomandibular ankylosis and paralysis of the facial nerve.

MATERIALS AND METHODS

In the period from January 1978 to December 1993, an interval of 16 years, 182 patients underwent reconstructive surgery in which the TMF was utilised. The TMF proved particularly useful in order to provide tissue when bulkiness and dynamics were required.

Of the 182 patients in this study, 102 were male (56%) and 80 were female (44%). The average age was 47 years, with 3 years being the minimum age (a child presenting temporal-mandibular ankylosis) and 85 years being the maximum age (a male presenting orbito-palpebral carcinoma requiring exenteration).

The majority of the operations (152 cases out of 182, an incidence of 83.5%) were reconstructive surgery following neoplasm resection.

Data regarding the pathology involved and the type of reconstruction performed with the TMF are summarized in Tables 1 and 2. In all cases the TMF was employed to restore not only the function but also the morphology of the reconstructed area.

Surgical technique

The surgical technique for preparing the TMF for its main application (orbital and oral reconstructions) begins with a coronal or hemicoronal incision. During the first phase, the dissection is carefully maintained in the subgaleal layer, in order to expose the superficial temporalis fascia. The superficial temporalis fascia is then incised while maintaining the dissection keeping close to the deep temporalis fascia. In order to mobilize the temporalis muscle, an incision is made into the deep temporalis fascia starting from its outer margin and proceeding along the superior temporal line and the superior border of the zygomatic arch. Incisions are then made in the attachments of the temporalis muscle at the inferior temporal line, at the lateral orbital margin and at the superior temporal crest. Subperiosteal elevation of the flap is mandatory to avoid damage to the blood supply. At this point the TMF, supplied by the deep temporal artery, is free and can be moved to its new site. For reconstructions in the oral cavity, it can be passed underneath the zygomatic arch. At the beginning of our experience, a temporary osteotomy of the zygomatic arch was routinely performed. Some years later, it became evident that osteotomy of the arch was not necessary and the muscle could be turned underneath the arch quite easily, providing that the anatomical conditions were favourable.

In order to obtain the greatest flap rotation, an osteotomy is then made at the base of the mandibular coronoid process so as to leave the flap as an island, while being extremely careful not to cut the muscle vascular pedicle which lies medial to the coronoid.

For intraoral reconstructions the TMF is transposed via a tunnel in the infratemporal fossa, with the fascia facing the oral cavity.

The flap can be easily rotated in the orbital region and skull base after ablative surgery. In moderate defects, it may be sufficient to utilize a portion of the muscle by splitting it into anterior and posterior segments. This results in two muscular-vascular pedicles being attached to the coronoid (Bradley, 1981).

When less bulk is required the TMF can be sectioned coronally while maintaining adequate blood supply to both anterior and posterior halves. After rotating the anterior part, the posterior part can be brought forward, thus avoiding a temporal depression.

Additionally, the muscle can be divided sagitally, in

Table 1 - Summary of clinical cases

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Number of patients</th>
</tr>
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<tbody>
<tr>
<td>Tumours</td>
<td>146</td>
</tr>
<tr>
<td>Maxilla/ethmoid</td>
<td>99</td>
</tr>
<tr>
<td>Mandible/oropharynx</td>
<td>47</td>
</tr>
<tr>
<td>Orbit</td>
<td>6</td>
</tr>
<tr>
<td>Craniofacial trauma</td>
<td>7</td>
</tr>
<tr>
<td>TMJ ankylosis</td>
<td>8</td>
</tr>
<tr>
<td>Total unilateral facial paralysis</td>
<td>9</td>
</tr>
<tr>
<td>Treacher Collins syndrome</td>
<td>3</td>
</tr>
<tr>
<td>Congenital palatal cleft</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>182</td>
</tr>
</tbody>
</table>

Table 2 - Use of temporalis muscle flap in reconstructive surgery

182 cases

<table>
<thead>
<tr>
<th>TMF Type</th>
<th>Number of Flaps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral</td>
<td>169</td>
<td>157 TMF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 TMF with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- coronoid process 9</td>
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<td></td>
<td></td>
<td>- skin island 2</td>
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<tr>
<td></td>
<td></td>
<td>- cranial bone 1</td>
</tr>
<tr>
<td>Bilateral</td>
<td>13</td>
<td>10 TMF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 TMF with cranial bone</td>
</tr>
</tbody>
</table>

Fig. 1 - Reconstruction of the anterior cranial base. Resurfacing of the anterior base with TMF after tumour resection of the orbit 'en bloc' with the ethmoid (arrows). Transposition of the flap to the midline was facilitated by removal of the orbital box. Besides sealing off the cranial base, the muscle was used to fill in the orbital cavity.
order to allow the use of the thinner outer half (Holmes and Marshall, 1979).

The cosmetic defect in the temporal area may be minimized by using alloplastic materials, rolled dermis, dermis fat or a bone graft.

Suction drainage in the temporalis fossa is advisable in order to prevent hematoma formation.

Particular details of surgical techniques for composite TMF-cranial bone transposition, facial reanimation, and TMJ ankylosis are described in the literature quoted in the introduction.

**CLINICAL APPLICATIONS**

**Reconstruction of the cranial base (Fig. 1)**

In the surgery of extensive maxillo-ethmoidal neoplasm, in 'en bloc' resection of the maxilla, orbits and cranial base, as well as in severe facial trauma, communication with the anterior skull base is inevitably created.

In these cases, the TMF may be used to cover the resected area, thereby providing a watertight seal between the neurocranium and the splanchocranium. This technique was applied in 12 cases: 10 neoplasms, 1 gunshot wound and 1 trauma. The latter case was a 16-year-old patient sent to us from another hospital with untreated severe craniofacial comminuted fractures. The frontal bone was necrosed and a cutaneous fistula was present. Since the galeal-pericranium flap had already been used unsuccessfully, the middle part of both temporalis muscles was raised in order to reconstruct the anterior cranial base. Two parietal bone grafts were used to reconstruct the forehead.

Likewise, a 43-year-old man with a gunshot wound, on whom a pericranium-galeal flap had been utilized, later presented a persistent cerebral-cutaneous fistula. Complete closure of the fistula was obtained by means of a TMF.

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**Fig. 2 - Reconstruction of the orbit.** (A) Malignant melanoma. Coronal CT scan showing the left orbit engulfed with a large homogeneous mass that displaced the eye producing proptosis. The dotted line marks the resection of the cranial base. (B) The resection included orbital exenteration 'en bloc' with the orbital roof and medial orbital wall. The TMF provided sufficient bulk to obliterate the orbit and repair the cranial base (arrows). (C) The patient 2 years after the resection. Socket surgery may be planned to allow insertion of an ocular prosthesis.
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Reconstruction of the orbit (Figs 2 & 3)

The TMF was used both for reconstructing the orbital floor in maxillary tumours that required resection, and for filling the orbital cavity after exenteration. In 4 cases, the orbital floor was reconstructed using the anterior part of the muscle. In another 9 patients, the floor was reconstructed with a mandibular coronoid process pedicled on the TMF according to Curioni's technique (1983). Since we prefer using the entire muscle to fill in the maxillary cavity and support the globe, we no longer use this technique.

Orbital reconstruction after exenteration was performed on 14 patients. In those in whom the lateral wall was also resected, the muscle was transposed into the orbit through a subcutaneous tunnel. In other cases, the muscle was passed through an opening created in the lateral orbital wall.
Reconstruction of the maxilla (Figs 4 & 5)

In 65 patients, the TMF was transposed into the maxillary area by passing it under the zygomatic arch, and then suturing it to the residual palatal and cheek mucosa. Neoplasm resection in 61 patients involved a hemimaxillectomy. Four patients required resection of the entire maxilla and consequently both TMFs were raised.

In a patient presenting with a facial gunshot wound, an osteomuscular calvarial flap pedicled on the TMF was used to rebuild the missing maxilla. In another case presenting sequelae of severe facial trauma with necrosis of the hemi-maxilla, the maxillary region was reconstructed by employing a TMF, later followed by iliac bone grafting and insertion of osseointegrated implants.

Temporomandibular joint ankylosis

The lower portion of the temporalis fascia and muscle can be used as a pedicle flap and interposed between the condylar stump and the glenoid fossa for the surgical treatment of TMJ ankylosis. It can either be brought lateral to the zygomatic arch or advanced medially and inferiorly to the arch. After removal of the ankylosis block in 8 cases of ankylosis (3 post-traumatic and 5 congenital) a strip of TMF was first passed under the zygomatic arch and then interposed between the condyle and the glenoid fossa.

Treacher Collins syndrome (Fig. 6)

In Treacher Collins syndrome, the TMF can be used as a vascular pedicle for an osteomuscular flap with cranial bone. The TMF constitutes the vascular pedicle for a cranial skull graft used to reconstruct the orbito-zygomatic region. This technique was performed on 3 children under the age of 6.

Reconstruction of palatal defects in cleft patients

Palatal defects in cleft patients are usually repaired with local mucosal flaps. In some selected cases the use of TMF in secondary repairs is suggested.
Three patients with wide palatal fistulae were successfully treated with the infratemporal transmaxillary technique as described by Demas and Soteranos (1989).

The muscle was split and the anterior portion was transposed into the oral cavity through an opening made in the lateral maxillary wall. The posterior part of the muscle was then advanced to fill in the depression in the temporalis fossa.

Reanimation of total unilateral facial paralysis (Fig. 7)

The TMF finds useful applications in the many techniques proposed for surgical reanimation of unilateral facial paralysis. The operative procedure has been described elsewhere (Conley, 1973; Rubin, 1977; Baker and Conley, 1979; Rubin, 1987). Since the length of the muscle strips is insufficient to reach the medial canthus and the mouth, the overlying deep temporalis fascia is used as a tendon to reach and be inserted into these areas. Nine patients were treated using this technique.

DISCUSSION

The TMF adapts well to multiple reconstructions in the cranio-maxillofacial area. The preparation and rotation of the flap can be easily performed if some basic concepts of surgical anatomy of the multiple temporo-parietal layers are well understood and kept in mind (Abul-Hassan et al., 1986).

In evaluating the spectrum of the different reconstructive procedures it is necessary to examine four different aspects: versatility, functional and morphologic results, temporary inconveniences, complications.

A valid watertight seal has always been achieved when separation between neurocranium and splanchocranium was required. Nevertheless, it is necessary to point out that the reconstruction of the basicranium with the TMF should be limited to selected cases, notably those in which the use of galea-pericranium flap has failed or was ruled out, and prior to considering more complex surgical or microsurgical procedures.

Reconstruction of the orbital area has given satisfactory results. In cases in which the eyelids were preserved, further stages were necessary to create a socket in which to position an ocular prosthesis. In the two cases of reconstruction with the TMF and skin island, the result was judged satisfactory, even if not optimal.

In the case of patients who had undergone reconstruction of the maxilla or intra-oral defects of various types (mandibular or hypopharyngeal resection) the evaluation of three functions was required: swallowing, chewing, and phonation. The first two functions were restored to a large extent with the aid of physiotherapy. Phonation, especially after maxillectomy, proved to be the most difficult function to restore and in some cases resulted in persistence of hypernasality.

The majority of the patients, with the exception of 6 of the 65 cases under consideration, underwent immediate reconstruction following maxillary resection. The question of hidden local recurrence following immediate surgical restoration could be raised. We feel that if the concept of box resection (i.e. resection within unaffected boundaries) is always kept in mind, immediate reconstruction is advisable. Recurrence may be detected by means of periodic CT scans or MRI, and not simply by ‘looking inside’. When relapse is suspected, a CT guided fine-needle biopsy or inspection with a fibre-optic nasoendoscope (Phillips and Peckitt, 1988) may be helpful. If recurrence does occur, then surgery is no longer effective. Radiotherapy or chemotherapy will be a palliative treatment. However, during the ‘interim’ the patient leads a normal family and social life.

In TMJ surgery, the use of the TMF provided a valid alternative to disc replacement material. It not only satisfied the criteria for an ideal graft, but also offered material which conceptually fulfils the physiologic functions of the disc.

The use of a vascularized cranial bone flap has been proposed in the treatment of Treacher Collins syndrome.

In this syndrome the orbital area is hypoplastic or lacking the zygomas and the superficial musculo-aponeurotic system (Tessier and Tuslane, 1987). Consequently, orbital reconstruction calls for a considerable amount of bone graft material that requires different reconstruction procedures. Since the orbits are three-dimensional structures, then three-dimensional reconstruction is required. The osteomuscular flap consists of a single piece of bone with very limited possibilities of carving. In our experience, there is no difference among the patients in whom we reconstructed the orbits with a pedicle temporalis bone flap and the ones in whom we used free cranial bone.

We subscribe to Tessier and Tuslane’s point of view (1992), which questioned the procedure, since in Treacher Collins syndrome the temporalis muscle is hypoplastic or even absent. This implies a negligible blood supply. Our preferred surgical sequence includes the reconstruction of the hypoplastic area at an early stage employing free cranial bone. This represents the framework upon which, at the second or third stage, an iliac bone graft will complete the reconstructive procedure.

The TMF may be used to repair wide fistulae in the secondary treatment of congenital cleft palate. Three adult patients were treated according to the transmaxillary technique and both presented uneventful closure of the fistula.

The TMF provides a valuable alternative for facial reanimation. The stigmata of facial paralysis were improved in many cases, but, as with other procedures, the possibility of spontaneous emotional expression was not completely restored. Eye closure was obtained in all patients while a satisfactory lower-facial emotion expression was achieved in 6 out of 9.
patients. The result depends largely on the patient's constant training and exercising which makes the balanced smile a conditioned reflex.

Disturbances and complications at both the donor and recipient sites were analyzed in the 182 cases treated and can be classified as follows:

- disturbances and complications due to fibrous metaplasia of the muscle rotated into the oral cavity and its retraction following radiotherapy
- disturbances and complications due to the preparation and rotation of the flap.

Disturbances resulting from reconstruction of the hypopharynx-mandibular region (47 cases) manifested themselves mostly as dysphagia. It was frequently associated with radical neck dissection and radiotherapy and resulted in liquid food passing out through the nose.

Another disorder is hypernasality of voice emission. Here the cause also lies in the soft palate which is subject to retraction following TMF healing, thereby creating reduction of the posterior soft palatopharyngeal seal. This disorder is worsened still further

Fig. 6 – For legend see facing page.
by radiotherapy. In order to minimize these inconveniences a three-fold rehabilitative programme, including physiotherapy, functional and motor rehabilitation as well as speech therapy, has been scheduled by our physiotherapists (Caldana et al., 1989).

Among the complications reported following flap preparation, impairment of the forehead branch of the facial nerve is to be considered. Thirty-five cases of transient paresis (19.2%) and 5 cases of permanent facial paralysis (2.7%) of the forehead branch were recorded.

Other minor complications are represented by serohaematic effusion at the donor site. These were resolved by means of evacuation puncture (10 cm³ maximum) and a pressure dressing. In 35 cases, the reconstruction of the temporal fossa was accomplished by using various materials: liophilized bovine cartilage (15 cases), silastic (6), polyethylene (5), dermis fat (5), hydroxylapatite (4). In 6 of the cases, corresponding to an incidence of 17%, it was necessary to remove the alloplastic material (4 Silastic, 2 hydroxylapatite).
Fig. 7 – For legend see facing page.
An early disturbance that has to be mentioned is neo-palate anaesthesia. The transposed muscle becomes covered with superficial sensory receptors soon after re-epithelialization, so that normal sensory functions are quickly restored (Caldana et al., 1989).

These disturbances do not actually constitute real or typical complications. They are disorders that are quite readily minimized with the aid of physiotherapy and compensatory skills which the patient acquires.

As for complications, total necrosis of the TMF occurred in 3 cases (1.6%). These patients had previously undergone chemotherapy. In 25 cases, partial intraoral dehiscences had been recorded. Small fistulae healed spontaneously, while the larger ones required secondary repair.

The most difficult complication to treat was reduced mouth opening, which occurred in 17 cases, corresponding to an incidence of 9.3%. The use of a Darcissac-type appliance combined with active physiotherapy was helpful in reducing the trismus.

CONCLUSION

Among the various flaps available in reconstructive craniomaxillofacial surgery, the temporalis myofascial flap is particularly indicated for its reliability, versatility and facility of employment.

Other reconstructive procedures are presently available. Myocutaneous flaps are safe, but their main disadvantages are the excessive bulkiness of the flap and the morbidity of the donor site. Microvascular tissue transfer is time-consuming, it often requires two teams. A full knowledge of microvascular techniques is mandatory.

In intraoral reconstruction with the TMF, re-epithelialization always does occur, even if the deep temporalis fascia often sloughs and necrotizes (Del Hoyo et al., 1994). Complete re-epithelialization takes 4–6 weeks (Bradley and Brockbank, 1981).

The main limitation of the TMF is the reduced length of the pedicle which does not allow reconstruction to the midline of the oral floor. Moreover, fibrosis may occur in oro-pharyngeal reconstruction, particularly in the retromolar area, which prevents normal opening of the mouth.

In conclusion, on the basis of our 16-year experience that covers almost every field of reconstructive surgery, we may state that the use of temporalis myofascial flap should be taken into account before deciding on more complex and extensive procedures. The use of this flap constitutes a quick, reproducible method of reconstruction associated with minimal morbidity.

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References


Fig. 7 - Temporalis muscle transposition for rehabilitation of the paralyzed face. (A) Pre-auralic incision with extension to the scalp. Two anterior slips of the muscle with deep temporalis fascia that acts as a tendon are transposed to upper and lower eyelids (see text). (B) The middle part of the muscle, elongated by the fascia, is transposed to upper-lower lip, melolabial fold, commissure. Overcorrection is essential. (C, D) A 35-year-old woman with a longstanding right facial palsy, treated elsewhere with static suspension. (E, F) Postoperative results at rest, and with eyes closed, 3 years after correction.


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