

# Temporoparietal fascial flap in reconstruction of Oro-facial defects

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## Abstract

Oro-facial defects, congenital or following a trauma or ablative surgery results in the compromise of function, form and aesthetic along with psychological suffering. The temporal region is an excellent donor site due its rich vascular supply and availability of diverse tissues-skin, fascia, muscle, galea, calvarial bone and pericranium. The Superficial temporal artery based flap is resourceful axial prototype flap used primarily in the reconstruction of midface, orbit, periorbit and palatal defects. The proximity of the flap to the defects allows harvesting the fascia or muscle or skin or as a composite tissue flaps depending upon the requirement of the case. This paper aims at highlighting the utility of the temporoparietal fascial flap in our case series of Oro-facial defects.

**Key words:** Oro-facial defects, temporoparietal fascial flap, superficial temporal artery

## Introduction

The prime esthetic units of face are forehead, eye/eyebrow, nose, lips, chin and cheek. Avulsive injury due to ballistic trauma and ablative surgeries involving these aesthetic units may result in defects, which are grotesque and are devastating to patients and their families. Reconstruction of Oro-facial defect is quite challenging, as it involves restoration of form, function and aesthetic. Conventionally these deformities are addressed using local flaps, the drawback of these flaps are its mass, color mismatch, hair growth, surgical morbidity and finally its uptake. The reconstruction of ear using temporoparietal fascia flap was first done by Golovine<sup>1</sup> in 1898, later Monks<sup>2</sup> used the flap in inferior eyelid reconstruction, since then it has found its extensive usage in reconstructive field. The temporal region is a significant donor site for cranio-maxillofacial region. The robust blood supply and anastomosis between various layers of this region has led to the designing of a range of flaps, tailoring it to the requirement of each case. The superficial temporal artery based flap has been widely used for reconstruction of surface defects of the upper and middle face. This paper highlights the multifarious use of this temporoparietal fascial flap in the reconstruction of orofacial defects.

## Case 1

A 57yrs/M patient reported with complaints of pain in the lower jaw. The past medical history revealed that the individual was a case of carcinoma of pharynx, treated only with chemotherapy and radiotherapy. On clinical and radiological examination diagnosed as a case of osteoradionecrosis mandible, fig. no.1. Individual was subjected to hyperbaric oxygen therapy prior to surgery. As a preoperative workup, feasibility of the flap was established using Doppler examination. A sub follicular flap was developed in a zig-zag pattern to avoid injury to artery, superficial temporal fascial flap was developed, zygomatic arch osteotomy was done to mobilize the flap into the defect. Superficial temporal artery based flap containing temporalis fascia, fig.no. 2 was used to cover the defect following sequestrectomy, fig. no. 3. The postoperative surgical result was satisfactory. The vestibular depth was maintained, fig. no. 4.



fig.no.1



fig.no.2



fig.no.3



fig.no.4

## Case.2

A 59yrs/m, reported with complains of difficulty in opening mouth and chewing food. Past medical history revealed that the individual was diagnosed as carcinoma oropharynx, one and half years back and underwent concurrent chemotherapy and radiotherapy. On clinical examination there was obvious facial asymmetry, hallowing of the cheek on the left side fig.no 5. On clinical and radiological examination diagnosed as radiation induced trismus. The case was taken up under GA for fibrotomy and reconstruction with

superficial temporal artery based flap fig.no.6. The superficial temporal artery based flap containing temporalis fascia and muscle was used . A zig zag incision and dissection at sub follicular level was used to mobilize the flap into the defect. The flap was tunneled, medial to the zygomatic arch and mobilized into the oral cavity fig. no. 7. Intraoperative interincisal opening of 35mm was achieved. Post operative recovery was uneventful fig. no. 8.



fig. no. 5



fig. no. 6



fig. no.7



fig. no. 8

## Discussion

Oro-facial defects, congenital or following a trauma or ablative surgery cannot be restored with any loco-regional flap alone. Because most regional flaps of the head and neck area are inadequate to reconstruct large defects in 3-D plane, free flaps designed in combined fashion are often the unique option in such cases<sup>3</sup>.

Subscapular flap was first developed by L'Heureux-Lebeau et al<sup>4</sup>, consists of latissimus dorsi flaps with 1 or 2 skin paddles along with a bony component, Similarly Gedebou et al<sup>5</sup> used the anterolateral thigh flap for restoring the complex orofacial defects.

The use of these free flaps needs microvascular expertise and demands time, hence poor option in elderly patients and their result are not superior to local flap choice. The major draw backs of these flaps are its bulk, hair growth and unaesthetic color match. In addition, free flaps needs frequent revision operations for improved esthetic and functional results<sup>6</sup>. The loco-regional flaps offers advantage over the distant flaps in terms of color match, expertise and time. The superficial temporal artery based flap, an axial flap has been widely used for reconstruction of surface defects of the upper and middle face<sup>7</sup>. The blood supply of the temporal region is derived from the superficial temporal, middle temporal, deep temporal, posterior auricular, transverse facial, zygomatico orbital, zygomaticotemporal, zygomaticofacial and middle meningeal arteries. These arteries and their branches form distinct arterial networks in the four tissue layers, the skin and superficial temporal fascia, loose areolar fascia, deep temporal fascia, the temporal muscle. These four layers anastomose with each other on many levels<sup>8,9</sup>. This forms the basis for flap, accordingly superficial temporal fascia flap, deep temporal fascia flap<sup>10</sup>, temporal muscle flap have been used to reconstruction of defects in the orbit, frontal bone, maxilla and the zygomatic region. The temporo-myofascial flap has bulk and provides well-vascularized tissue that withstands radiation; in our case series all cases have been previously subjected to radiation, the flap take up was successful thus supporting the fact temporal flap is radioresistant. The foremost restraint of temporal flaps is the short pedicle and insufficient arc of rotation; consequently restricts its use to upper facial defects. Since Kim and Park<sup>11</sup> first described the use of the reverse temporalis muscle flap for anterior cranial defects, it has been used effectively for reconstruction of bony defects in the anterior skull base defects, and orbital socket reconstruction because of its lengthy pedicle and wide arc of rotation. We have adopted this technique in our first case. As a preoperative workup Doppler assessment of the temporal region is very crucial and dictates the outcome of surgery. The flap development in the subfollicular plane using a straight incision or zig zag pattern is a operators choice, we preferred zig zag pattern as it helped in dissection and better approximation during closure. The literature reports flap necrosis as a complication, no such complication has been reported in our case series.

## Conclusion

The superficial temporal artery based flap is a dependable flap with minimal morbidity of donor site. Today superficial temporal flap is a work horse for the maxillofacial surgeons. The flap has multifarious utility in the reconstruction of orofacial defects, due to the option of using it with a calvarial bone.

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