

The Temporalis Muscle Flap and Temporoparietal Fascial Flap



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KEYWORDS

- Temporalis muscle flap • Temporoparietal fascial flap • Head and neck reconstruction
- Reconstruction • Calvarium

KEY POINTS

- The temporalis muscle (TM) flap is supplied by the anterior and posterior deep temporal arteries and innervated by a branch of the trigeminal nerve.
- The TM flap can provide both a dynamic muscle flap for facial reanimation surgery and bulky tissue for soft tissue augmentation.
- The superficial temporal artery provides the blood supply to the temporoparietal fascia (TPF).
- The thin and pliable structure of the TPF flap provides excellent tissue quality for resurfacing the ear, orbit, and the oral cavity.

INTRODUCTION

The temporal arterial system provides a favorable donor site for head and neck reconstruction and consists of the temporalis muscle (TM) flap and temporoparietal fascial (TPF) flap. These 2 flaps are based on separate vascular pedicles that permit independent flap development. Flaps developed from the temporalis system were first reported in the 1800s¹ and continue to maintain great popularity among reconstructive surgeons. Versatility in flap design by encompassing various tissue types (muscle, fascia, skin, and bone), proximity to the recipient sites, and low donor site morbidity are the primary reasons for their popular demand.

ANATOMY

The TM originates from the superior temporal line and inserts in the coronoid process of the mandible. It is covered by a thick temporalis fascia

that splits into superficial and deep layers approximately 2 cm superior to the zygomatic arch. These 2 layers insert in the medial and lateral aspects of the zygomatic arch and eventually form the parotidomasseteric fascia. Between the superficial and deep fascia lies the superficial temporal fat pad. The deep temporal fat pad, an extension of the buccal fat pad, and the TM lie beneath the deep temporalis fascia (**Fig. 1**). Separating the temporalis fascia from the overlying TPF or the muscle underneath is relatively straightforward.

The TM flap has a Mathes and Nahai type III vascular pattern (2 major blood supplies). The deep temporal artery (branch of internal maxillary artery) and vein enter the medial surface of the muscle below the zygomatic arch, and the middle temporal artery (branch of superficial temporal artery) runs on the superficial surface of the muscle. The deep temporal artery divides into anterior and posterior branches: the anterior deep temporal artery (ADTA) supplies the anterior 20% of the

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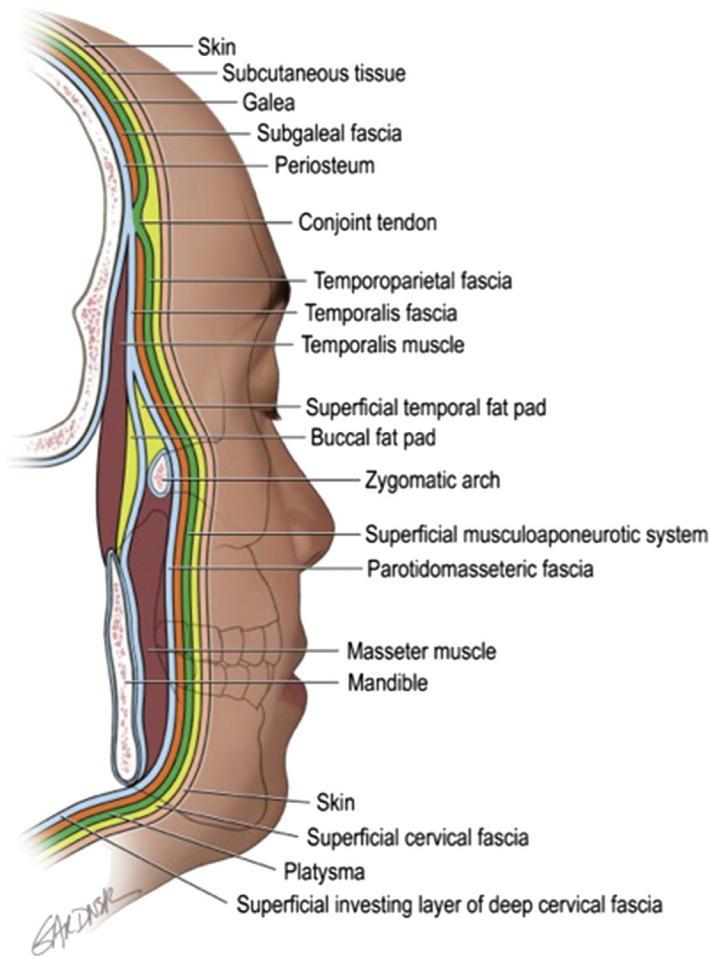


Fig. 1. Anatomy of fascial layers from vertex of the skull to the neck. (Courtesy of Dr David Webb, David Grant Medical Center, Travis Air Force Base, California.)

muscle, whereas the posterior deep temporal artery (PDTA) provides blood supply to the middle 40% of the muscle. The remaining muscle in the posterior region (40%) is supplied by the middle temporal artery.² The ADTA is located 2 cm anterior to the coronoid process and 2.4 cm inferior to the arch, whereas the PDTA is located 1.7 cm posterior to the coronoid process and 1.1 cm inferior to the arch.³ Although the middle temporal artery supplies a large part of the muscle, it is commonly sacrificed during harvesting, and there is little impact on the flap's survival as a result. The function of the TM is to elevate and retract the mandible during mastication. The muscle is innervated by a branch of the trigeminal nerve, and this motor innervation must be preserved for facial reanimation surgery.

The TPF flap is a thin pliable tissue. The TPF represents the inferior extension of the galea after the temporal line and the superior extension of the subcutaneous musculoaponeurotic system

(SMAS) above the zygomatic arch. Its blood supply is derived from the superficial temporal artery in 88% of cases. Eight percent of the TPF flap is supplied by the posterior auricular artery, and the remaining 4% is supplied by the occipital artery.⁴ The superficial temporal artery can be identified above the zygomatic arch and 2 cm anterior to the external auditory meatus.⁵

INDICATIONS/CONTRAINDICATIONS

The TM and TPF flaps have multiple applications for head and neck reconstruction. The TM flap provides dynamic muscular tissue, whereas the TPF flap provides thin and pliable tissue. **Table 1** lists the common indications for both flaps.

Few contraindications are associated with these flaps. Previous surgery or trauma to the scalp or temporozygomatic regions represents a contraindication for the use of these flaps. It is prudent to inform patients that there will be a significant,

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