2. Discuss the anatomy of the SMAS, platysma and the facial nerve. Please help us understand the temporal fascia. Do the nerves travel in the superficial layer of the deep temporal fascia, or the deep layer of the superficial temporal fascia? I am so confused!

**SMAS:** The superficial musculoaponeurotic system is a fibromuscular fascial extension of the platysmal muscle that arises superiorly from the fascia over the zygomatic arch and is continuous in the inferior cheek with the platysmal muscle. The facial nerve lies deep to the SMAS and innervates the mimetic muscles of the forehead and mid-face from the ventral aspect of the muscles.

The Superficial musculoaponeurotic system (SMAS) fascia is a fanlike fascia that envelops the face and provides a suspensory sheet which distributes forces of facial expression. The SMAS is continuous with the platysma muscle inferiorly and the superficial temporal fascia superiorly, and it is superficial to the parotomasseteric fascia. The SMAS connects to the fascial musculature in the nasolabial, perioral, and periorbital regions.

On a cellular level it comprised of collagen fibers, elastic fibers, fat cells and muscle fibers. Ghassemi et al. found two types of SMAS architecture, type 1: lateral to nasolabial fold (relatively small fibrous septa) medial type 2: dense collagen muscle-fiber meshwork

**FN:** As a review: efferent fibers from the motor cortex (precentral and postcentral gyri) synapse at the motor nucleus and the superior salivatory nucleus of the tractus solitarius. The FN leaves the brainstem to enter the skull via the IAC (meatal segment), then traverses the petrous part of the temporal bone to the facial hiatus (labyrinthine segment). From the geniculate ganglion to the pyramidal eminence the FN segment is termed the tympanic segment. The FN then winds from the pyramidal process to Stylomastoid forame (mastoid seg) and exist the skull to the pes anserinus (extratemporal seg) which branches into the temporal, zygomatic, buccal, and marginal

mandibular, and cervical branches. (post auric arises proximal to parotid)

1) Facial nerve branches that exit the parotid gland are deep to the SMAS. The frontal branch of the facial nerve is deep to the superficial temporal fascia. Therefore, to avoid injury, the plane of dissection should not be as deep as the temporal fascia.

2) FN lies below the parotomasseteric fascia at the parotid region, but this can be very thin and variable

3) Frontal branch of the TZ division estimated by pitaguys’ point: 0.5cm lat to tragus and 1.5cm lateral to the lateral brow

4) Danger zone for the temporal branch of the facial nerve, defined as the region overlying the zygomatic arch between 1.8cm anterior to the helical root and 2cm posterior to the anterior end of the arch
For the purpose of this discussion, several important points can be made about the anatomy of the FN in relationship to the SMAS rhytidectomy flap:

*** The frontal branch of the temporal-zygomatic division of the facial nerve is the next most commonly injured nerve (2.6-4%). It b/c of its superficial location as it traverses the midportion of the zygomatic arch. A more superficial dissection in this area minimizes neural damage.

*** Injury to the marginal nerve can occur when extensive tissue dissection is performed in the neck. If a platysmal transection is performed, the possibility of nerve injury increases. (Landmark of marg: deep to platys but at 2cm lateral to corner of mouth takes a more superficial position) Buccal motor nerve branches can also be injured with aggressive dissection medial to the anterior border of the parotid gland.

**Platysma**: broad muscular sheet arising from the fascia covering the upper parts of the Pectoralis major and Deltoideus; its fibers cross the clavicle, and proceed obliquely upward and medialward along the side of the neck. The anterior fibers interlace, below and behind the symphysis menti, with the fibers of the muscle of the opposite side; the posterior fibers cross the mandible, some being inserted into the bone below the oblique line, others into the skin and subcutaneous tissue of the lower part of the face, many of these fibers blending with the muscles about the angle and lower part of the mouth. Sometimes fibers can be traced to the Zygomaticus, or to the margin of the Orbicularis oculi. Beneath the Platysma, the external jugular vein descends from the angle of the mandible to the clavicle.

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With 71 rhyditectomies, On average, the platysma extended 3.98 cm along the malar mandibular line, superiorly from the inferior border of the mandible. The platysma was located 3.09 cm inferiorly from the malar eminence along the malar mandibular line. On average, the platysma muscle occupied 56% of the malar mandibular line.

7. Discuss the anatomy of the SMAS, platysma and the facial nerve.

SMAS/ Temporal fascial argument:

SMAS description:

**Table 1. Definitions of the SMAS**  Ghassemi et al. Anatomy of the SMAS revisited

<table>
<thead>
<tr>
<th>Definition</th>
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<tbody>
<tr>
<td>1) Superficial fascia or tela subcutanea</td>
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<tr>
<td>2) SMAS: continuous fibrous net sending several extensions out to the dermis;</td>
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<tr>
<td>comprises all the attachments from the facial muscles to the dermis; in continuity with the posterior part of the frontalis muscle and with the platysma</td>
</tr>
<tr>
<td>3) SMAS: Fascia superficialis Fascia parotideae: fibrous degenerated platysma continuous with the platysma</td>
</tr>
<tr>
<td>4) SMAS: distinct fibromuscular layer composed of the platysma muscle, parotid fascia and fibromuscular layer covering the cheek</td>
</tr>
<tr>
<td>5) Layers of face:</td>
</tr>
<tr>
<td>1. Skin</td>
</tr>
<tr>
<td>2. Subcutaneous fat</td>
</tr>
<tr>
<td>3. Superficial fascia (SMAS): extension of the superficial cervical fascia</td>
</tr>
<tr>
<td>4. Mimetic muscles</td>
</tr>
<tr>
<td>5. Deep facial fascia (parotidomasseteric fascia)</td>
</tr>
</tbody>
</table>
6. Retaining ligaments
6) Layers of face:
1. Dermis
2. Fascial fatty layer: subcutaneous tissue with dense network of fibrous septa
3. SMAS: distinct musculoaponeurotic layer in continuity with the platysma
4. Separate parotid fascia
7) Three layers of SMAS:
1. Layer of SMAS fascia superficial to musculature
2. Layer of muscle
3. Deep layer of the SMAS extensively attached to the skeleton
8) Skin is connected to SMAS by fibrous septa and SMAS has intimate connections to mimetic muscles; the SMAS is a composite tissue comprising collagen, elastin, fat cells, and interstitial fluid

Layers of the scalp: The first layer consists of the skin and subcutaneous tissue. Immediately deep and firmly bound to this layer is the temporoparietal (sometimes called superficial temporal) fascia. This layer is contiguous with the superficial musculoaponeurotic system (SMAS) as it passes over the zygomatic arch into the mid face, and it is contiguous with the galea aponeurotica above the superior temporal line. Beneath the temporoparietal fascia lies a loose areolar and avascular tissue layer that separates the fascia from the temporalis muscular fascia (sometimes termed the deep temporal fascia). This areolar layer allows the superficial scalp to move freely over the deeper and more fixed temporalis muscular fascia, temporalis muscle, and pericranium.

Confusing the issue further is the division of the temporalis muscular fascia as it splits into a superficial and deep layer (of the deep temporal fascia) surrounding a fatty tissue pad at the temporal line of fusion, approximately 2 cm above the zygomatic arch. The temporalis muscular fascia is contiguous with the pericranium above the superior temporal line and is contiguous with the masseter muscle fascia below the arch.

8. Discuss the blood supply of a face lift flap.
The facial skin is supplied by brs of the ECA, the superficial temporal a, facial a, transverse facial a, and infra orbital artery- these vessels anastamose together to form a subdermal plexus. The subcutaneous flap is supplied mainly by musculocutaneous perforators as they emerge from 3 main arterial trunks: the facial, superficial temporal, and ophthalmic arteries. Most blood flow originates in the central facial area, and rich anastamotic networks exist. This allows for skin-flap survival after undermining. As more extensive dissection is carried out medially, the risk of ischemia in the flaps increases. With the standard subcutaneous and SMAS two-layered facelift however effectively divides the the skin from its underlying perforating branches. However these flaps have been used for many years with low flap failure.

NLF is absent in the newborn and in the presence of nerve paralysis. It deepens in old age and is retained even in death. The superior extent of the fold is at the junction of the alar nasi, the cheek, and the upper lip. The fold then extends inferiorly in either a straight, convex, or concave shape and ends below and lateral to the corner of the mouth. It is has been suggested that the fold is merely a cutaneous crease secondary to skin excess and that except for a light fracture of the superficial dermis there is no deep structure shaping the form of the fold. It is dependent on muscle activity related to smiling. This study found that of the 14 cadavers examined, beneath the fold were 2 muscle bundles. The more superficial muscle runs parallel to the fold whereas a deeper muscle runs at right angles to it. The buccal fat pad lies above the fold and appears to be retained by horizontal septae in the fat pad and also by the musculature of the fold. Cadavers showing a poorly defined nasolabial fold had fewer muscle bundles to support the fat and fewer fibrous septae running through the fat.