



## ROLE OF ANATOMICAL LANDMARKS IN IDENTIFYING FACIAL NERVE DURING PAROTIDECTOMY: OUR EXPERIENCE

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### ABSTRACT

Facial nerve paralysis is a common complication during parotid surgery. Various anatomical landmarks are useful for identifying facial nerve location intraoperatively. Our study was conducted in G G Hospital, Jamnagar among 30 patients. Three landmarks which were studied were tragal pointer, tympanomastoid suture, posterior belly of digastric muscle. Tragal pointer was easiest to identify, but mobile, whereas tympanomastoid suture was most consistent in location but difficult to identify. Facial nerve was found to be 1cm above and parallel to upper border of posterior belly of digastric muscle near insertion of mastoid tip.

**KEYWORDS :** facial nerve, parotidectomy, tragal pointer, tympanomastoid suture, posterior belly of digastric muscle

### BACKGROUND

Identification of facial nerve is very crucial for prevention of facial nerve paralysis during parotidectomy. The anatomy of facial nerve is subject to many anatomical variations, which poses risk to its injury. There are two approaches to identify facial nerve, antegrade and retrograde[2]. Antegrade approach is identification of main trunk and retrograde is identification of branches to main trunk. Many landmarks have been useful for locating facial nerve trunk[8].

For antegrade approach,

1. Tragal pointer- nerve lies approximately 1.0 to 1.5 cm deep and slightly anterior and inferior to tragal cartilage tip.
2. Posterior belly of digastric- nerve lies approximately 1 cm deep to medial attachment of posterior belly of digastric.
3. Tympanomastoid suture- Facial nerve is 3mm inferior to tympanomastoid suture.
4. Styloid process- nerve trunk is infero-lateral to it.

For retrograde approach,

1. Marginal mandibular nerve- found at angle of mandible.
2. Buccal branch- runs parallel and below arch of zygoma towards corner of mouth.
3. Zygomatic branch- cross arch of zygoma near upper anterior corner of gland.

Apart from this, retromandibular vein, parotid-mastoid fascia, external auditory meatus, transverse process of axis, stylomastoid artery are other landmarks[4].

Facial nerve stimulator/monitor helps to localise the nerve through stimulation with observation of facial nerve movements.

### MATERIALS AND METHODS

This study was conducted in G G Hospital, Jamnagar. 30 patients in duration of 3 years from January 2020 to November 2022 who have undergone parotidectomy have been enrolled in study. All age groups with parotid swelling of different etiologies were included. The patients with advanced malignancy and who have undergone revisional surgery were excluded from the study.

### Surgical technique

All parotidectomies were performed under general anesthesia with patient lying supine and neck extended and slightly rotated to opposite side. Modified Blair's incision was made, starting from preauricular crease, continuing inferiorly and curving around earlobe backwards to mastoid process, extending towards hyoid in a skin crease. Superficial musculo-aponeurotic flap was elevated and subplatysmal

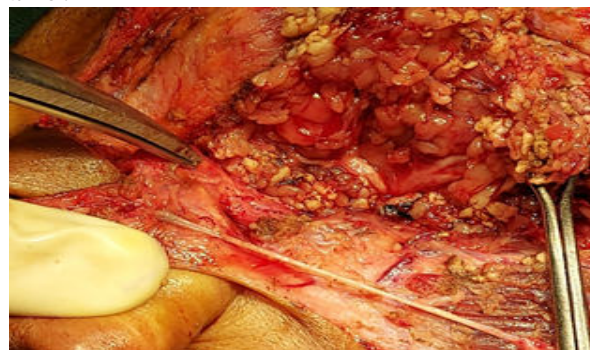
plane in neck was elevated upto anterior border of masseter. Greater auricular nerve was identified, parotid gland was dissected from cartilaginous external auditory canal and anterior border of sternocleidomastoid muscle which was retracted to expose posterior belly of digastric. Tragal pointer was identified. Periosteum over mastoid process was elevated in anterior direction to view tympanic plate. V-shaped Tympanomastoid suture was identified. After identifying these three landmarks, facial nerve was identified between tragal pointer and posterior belly of digastric muscle. Slide callipers were used to measure distance from edge of facial nerve trunk and each of the landmarks. Facial nerve monitors were not used in this study.

### OBSERVATIONS

30 patients were taken for study who underwent parotidectomy, 12 patients were in the age group of 20-40 (40%), 13 patients were between 41 to 60 years ( 43.33%) and 5 patients were above age of 61 (16.67%).

The mean distance between the facial nerve trunk and tragal pointer was 7.2mm (ranging from 6-14 mm), tympanomastoid suture was 5.4 mm ( 3-9 mm), posterior belly of digastric was 9.2mm (7-14 mm).

Of 30 patients who were operated, only one developed facial palsy, due to unusual anatomy in case of a huge Warthin tumor.



**Figure 1 :** relation of tragal pointer with facial nerve trunk, distance between two is measured 8.1 mm.

### DISCUSSION

Facial nerve injury is very common complication in parotid surgeries, therefore proper knowledge of anatomy of facial nerve and it's landmarks allow safe and fast dissection in the potential plane between superficial and deep lobe of parotid[1].

An ideal landmark should be consistent and have stable relationship with the nerve.

Tragal pointer is an easily identified landmark, however, it is mobile, asymmetrical and blunt tip structure, which makes it less reliable.

Tympanomastoid suture lies close to facial nerve trunk, but it is obscured by sternocleidomastoid muscle which makes its identification difficult.

Facial nerve lies approximately 1cm above and parallel to upper border of digastric muscle near insertion of mastoid tip.

Stylomastoid foramen is anatomically constant landmark, but difficult to identify as it is surrounded by thick fascia and excessive dissection can damage facial nerve.

In a study by Ru et al, distance of tragal pointer to facial nerve trunk was 3.2- 9.9mm, while by Rea et al was  $6.9 \pm 1.8$  mm. In our study distance was 7.2 mm[2].

In study by Bushey et al, mean distance of facial nerve trunk from tympanomastoid suture was 4.9mm, compared to our study it was 5.4mm.

In study by Ru et al and Saha et al, distance of facial nerve trunk from posterior belly of digastric muscle was  $7.4 \pm 2.42$  mm while in our study it was 9.2mm[2,3].

## CONCLUSION

To prevent trauma to facial nerve trunk during parotid surgeries, we have studied three landmarks[2]. We found that tympanomastoid suture is most invariable in position and nearest to facial nerve, but, exposure needs deep dissection. Posterior belly of digastric is easily exposed by retraction of sternocleidomastoid, is a constant landmark[8,7]. However, we can conclude that more than one landmark can be used for safe identification of facial nerve.

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