TRAGAL POINTER AS A SURGICAL LANDMARK FOR THE IDENTIFICATION OF FACIAL NERVE TRUNK IN PAROTIDECTOMY: OUR EXPERIENCE

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ABSTRACT

BACKGROUND: Facial nerve paralysis is a major complication of parotid surgery, widely reported. Knowledge of the key landmarks of the facial nerve trunk is essential for safe and effective surgical intervention in the region of the parotid gland. In current practice, wide ranges of landmarks are used to identify the facial nerve trunk; however, there is much debate in the literature about the safety and reliability of each of these landmarks. The present study aim was therefore to evaluate the tragal pointer as a surgical landmark for identification of facial nerve trunk.

OBJECTIVE: To evaluate the tragal pointer as a surgical landmark for identification of facial nerve trunk.

MATERIAL AND METHODS: This Cross sectional observational study was conducted in ENT Department, Saidu Teaching Hospital Saidu Sharif Swat, KPK Pakistan from January 2014 to July 2016. Thirty Patients having parotid lump, aged 10 to 70 years were admitted through OPD and operated after examination, relevant investigation and informed written consent. Tragal pointer was used as a sole landmark for the identification of facial nerve. Data was collected on a predesigned proforma and analyzed on SPSS version 19 for descriptive statistics.

RESULTS: Out of thirty patients, 80% (n=24) were female while 20 % (n=06) were male with the mean age of 34 ± 3 years. All were presented with a parotid lump mostly on the right side. Twenty eight 93.3% patients had benign pathology while two patients 6.6 % had malignancies. The most common postoperative complication was temporary facial nerve paresis in 3.3% patients. Marginal mandibular nerve was the most common branch involved in facial nerve paresis. Tragal pointer was used as a surgical land mark in twenty eight (93.3 %) while retrograde dissection was done in 6.6 % (n=2) cases in which tragal pointer identification was difficult due to fibrosis in the adjacent tissue. Tragal pointer was lying at a distance of 16.5 mm to 21.5 mm from the facial nerve trunk and was more consistent in position and direction.

CONCLUSION: Tragal pointer is an important, consistent and easily identifiable surgical land mark for the identification of facial nerve trunk in primary parotid surgery to minimize damage to facial nerve.

Key Words: *Tragal Cartilage, Facial Nerve Identification, Parotidectomy.*

This article may be cited as: Ihsanullah, Khan AS, Iqbal M, Hussain G. Tragal pointer as a surgical landmark for the identification of facial nerve trunk in parotidectomy: our experience JSMC 2017;7(1): 4 - 7.

INTRODUCTION

Parotidectomy is basically an anatomical dissection. Identification of the facial nerve trunk is essential during surgery of the parotid gland because facial nerve injury is the most daunting potential complication of parotid gland surgery owing to the close relation between the gland and the extra temporal course of facial nerve. There are two approaches to identify the facial nerve trunk during parotidectomyconventional antegrade dissection of the facial nerve, and retrograde dissection. Numerous soft tissue and bony landmarks have been proposed to assist the surgeon in the early identification of this nerve. Most commonly used anatomical landmarks to identify facial nerve trunk are stylomastoid foramen, tympanomastoid suture (TMS), posterior belly of digastric (PBD), tragal pointer (TP), mastoid process and peripheral branches of the facial nerve. Use of so many landmarks to identify the facial nerve trunk points to the fact that there is lack of consensus regarding the safety and reliability of each of these landmarks[1].

More precisely, the tragal cartilage (lamina tragi) is used as a landmark for the facial nerve. At the bone cartilage junction, the tragal cartilage forms a triangular excrescence called the triangular process, described in the literature as Schwalbe's line after the anatomist who described this structure for the first time. It was subsequently erroneously attributed to the concha by Conley[2], who called it the “tragal pointer” to highlight the fact that this landmark pointed to the emergence of the facial nerve, situated 7.5 mm (± 2.5 mm) anteriorly and more deeply to this point[3]. Tragal pointer is the most commonly used land mark for identification and dissection of the facial nerve[4].

The present study was conducted with the aim to consider tragal pointer as easily identifiable landmark for the identification of facial nerve during parotid surgery.

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Received: December 5, 2016, Accepted: January 13, 2017

MATERIAL AND METHODS:

This study was conducted at Department of ENT and Head & Neck surgery Saidu Teaching Hospital Saidu Sharif Swat from January 2014 to July 2016. Patients were included in this study by non probability purposive sampling. All the patients of either gender having parotid lump, aged 10 to 70 years were included in the study. Patients with uncontrolled systemic diseases, not fit for general anesthesia, those having preoperative facial paralysis were excluded. All patients admitted through OPD after initial work up of history, examination and investigations including parotid ultrasound, Fine needle aspiration cytology (FNAC) and other baseline investigations. The operative procedure was tailored according to the type and extent of the disorder. Superficial parotidectomy was performed for all benign tumors confined to superficial lobe. Total conservative parotidectomy was performed for malignant tumors as well as benign tumors involving the deep lobe. For identification of facial nerve tragal pointer was used as a surgical landmark. The nerve was confirmed once it was seen to divide into two main branches. All branches were subsequently traced and superficial parotidectomy was performed. In performing these procedures no nerve stimulator was used. All the surgeries were performed with the use of operating microscope.

The data was collected in a proforma and analyzed through Statistical Packages for Social Sciences (SPSS) version 19. The numerical data such as age were expressed as mean ± standard deviation while categorical data such as gender distribution, surgical procedures and complications observed were expressed as frequencies and percentages.

RESULTS

Thirty patients were included in this study. Out of thirty patients, 80% (n=24) were females while 20 % (n=06) were males. The female to male ratio was 4:1 (24 females and 06 males) as shown in Table 1.

Table 1: Gender Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	24	80.0	80.0	80.0
	Male	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Mean age of the patients in this study was 34 ± 3years. Swelling or lump in the parotid region constituted the most frequent presenting feature, found among all patients. Overall, 93.3% (n= 28) cases had benign pathology while 6.6 % (n=2) had malignancies. Table 2 shows the histological diagnosis among the patients found on histopathology of the surgical resection specimen.

Table 2: Histopathology after surgical resection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pleomorphic Adenoma	28	93.3	93.3	93.3
	Mucoepidermoid Carcinoma	1	3.3	3.3	96.7
	Adenoid cystic carcinoma	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

The most common surgical procedure instituted was superficial parotidectomy, performed in 93.3 % (n=28) patients. Total conservative parotidectomy was performed in 6.7 %,(n=2) cases. In 70 % (n=21) Patients surgery was done on the right side while in 30 % (n=9) left side was involved by the parotid mass.

Tragal pointer was used as a surgical land mark in 93.3 % (n=28) cases while retrograde dissection was done in 6.6 % (n=2) cases in which tragal pointer identification was difficult due to fibrosis in the adjacent tissue as shown in the Table 3.

Table 3: Identification of Tragal pointer as surgical land mark

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Identified	28	93.3	93.3	93.3
	Not Identified	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

DISCUSSION

This study focused on the identification of the main trunk of facial nerve with tragal pointer as a surgical land mark. In this study, the mean age for parotid gland disorder was 34 ± 3years confirming to several published studies[5,6].

In this study there was a female predominance. Several published studies have reported similar frequent involvement of females than males[7-9].

Pleomorphic adenoma constituted commonest pathology affecting the parotid gland. Most of the published literature has reported pleomorphic adenoma to be the commonest pathology afflicting the parotid gland[7-9].

The commonest malignant tumor in this study was mucoepidermoid carcinoma followed by adenoid cystic carcinoma. These findings confirm to what is reported by most of the published literature[10-13].

The incidence of temporary facial nerve paresis was 3.3 % (n=1). Marginal mandibular nerve was the most common branch involved with results very similar to the study conducted by Owusu et al in 2013.

In assessing the accuracy and reliability of commonly used facial nerve trunk landmarks, Pather and Osman[14] examined the relation of the facial nerve trunk to the tragal pointer, tympanomastoid suture, attachment of the posterior belly of the digastric muscle, external auditory meatus, transverse process of the axis, angle of the mandible, and the styloid process.

More specifically, Wetmore[15] described the importance of the tragal pointer in relation to identifying the extra temporal branch of the facial nerve during a parotidectomy procedure.

With regard to the tragal pointer, the investigators observed considerable variability in the size, shape, and direction in which it “pointed”, which is in contradiction with our study in which we found it more constant in position and direction[15].
In the present study we found that tragal pointer lies at a distance of 16.5 mm to 21.5 mm from the facial nerve trunk as shown in the Table 4.

Table 4: Distance (mm) of Facial Nerve trunk from Tragal pointer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16.5	2	6.7	6.7	6.7
	16.8	1	3.3	3.3	10.0
	17.0	2	6.7	6.7	16.7
	17.3	1	3.3	3.3	20.0
	17.4	1	3.3	3.3	23.3
	17.5	3	10.0	10.0	33.3
	18.0	2	6.7	6.7	40.0
	18.3	1	3.3	3.3	43.3
	18.7	1	3.3	3.3	46.7
	19.2	1	3.3	3.3	50.0
	19.5	2	6.7	6.7	56.7
	20.0	2	6.7	6.7	63.3
	20.5	3	10.0	10.0	73.3
	21.0	4	13.3	13.3	86.7
	21.5	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

Somnath Saha, et al[1] in their study reported results very similar to our study.

This study has some limitations. It is single center observational study. Observer bias could not be eliminated completely. The author recommends multicenter local study to confirm and improve upon these results.

CONCLUSIONS

Tragal pointer is an important, consistent and easily identifiable surgical land mark for the identification of facial nerve trunk in primary parotid surgery to minimize damage to facial nerve.

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