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Research Article

A study on structural variations of the parotid glands

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ABSTRACT

Background: The anatomical structural Scenario of the largest Salivary glands, the parotid glands taken for study because of its clinical interventions like parotid abscesses, Sailoliths, growths may effect the intervening neurovascular bundle which passes through the substance of the parotid gland, and also its affiliations towards the scrotum in mumps. The swellings of the parotid glands cause compression on facial nerve. The Injury to the facial nerve during surgical procedures which may produces face muscles paralysis. The parotidectomy for benign and malignant growths warrants the surgeons for facial nerve injury.
Methods: The study includes 50 parotid glands in dead fetuses; 20 parotid glands in adult cadavers of formalin fixed specimens. The glands are exposed according to incisions of Cunningham manual. The extents noted, capsule removed. Measurements taken, shapes observed and tabulated.
Results: Variations observed and noted for the accessory lobes. The adult parotid glands are Pyramidal shaped (10 out of 10 glands). The foetal glands are 60% are Pyramidal (30 out of 50 glands), 40% are rounded shape (20 out of 50 glands). The apex extension to the carotid triangle is 20% in adult cadavers (2 out of 10 glands); 8% in foctuses (4 out of 50 glands). According to the measurements the length is 2 times more than the width of the gland in pyramidal shaped; the length and width are nearly equal in rounded shaped glands. The accessory parotid glands present in 20% of adult glands, 12% of foetal glands.
Conclusions: According to the present Study major number glands are Pyramidal shaped in foctoses than rounded shape. All the adult glands are Pyramidal shaped glands. Accessory lobes present both adult & foetal specimens.

Keywords: Salivary glands; Parotid gland, Accessary lobe, Pyramidal shape, Rounded shape

INTRODUCTION

The parotid glands are paired salivary glands present by the side of the face and upper part of the neck below the external acoustic meatus. Each gland is an inverted Pyramidal in shape and the apex may extends upto the Carotid triangle.[1] The parotid gland is the largest salivary gland of the major Salivary glands which drains saliva into the Oral cavity through the parotid duct. It is a mainly serous gland with very few scattered mucous acini. It is a large irregular, lobulated gland extends from Zygomatic arch to the upper part of the neck. Anteriorly the gland overlaps masseter muscle; usually detached accessory parotid lies above the parotid duct. The gland extends below the external acoustic meatus. Posteriorly on to the mastoid process.[2] The gland enclosed within a thick capsule which is derived from deep cervical fascia. The capsule covering the Superficial Surface is adherent to the gland and attached to the zygomatic arch above. The deep part of capsule attached to styloid process and they angle of mandible which forms Stylomandibular ligament. The Stylomandibular ligament intervenes between parotid and Submandibular Salivary glands. Because the fascia is thick densly and compactly encircling the gland, any

swelling of the gland due to viral infections e.g. mumps, bacterial inflammations increase the pressure on nervous endings leads to severe pain. The parotid gland is like an inverted flattened three sided Pyramid. It presents a small superior surface, superficial surface, anteromedial and posteromedial Surfaces. The lower part of the gland tapers down to a blunt apex. The parotid gland provides 25% of total volume of Saliva. The Saliva provides aqueous solvents necessary for taste Sensation, Lubrication of food and also assists in deglutition.[3] Auriculotemporal Syndrome (or) Frey's Syndrome (Gustatory Sweating) is a Surgical Complication during Surgeries for parotid abscess (or) Suppurative parotitis and sailoliths.[4] The authors observed Salmonella parotitis with abscess formation in human immunodeficiency virus affected patients.[5] A number of nonglandular Structures enclosed in the substance of the parotid gland, they traverse and branch in it. (a) The external carotid artery enters through posteromedial surface and divides into two terminal branches (1) maxillary artery and (2) Superficial temporal artery. (b) The retromandibular vein formed in the upper part of the gland by the union of maxillary vein and superficial temporal vein. After passing through substance it divides into anterior and posterior divisions at the apex of the gland. (c) The facial nerve piercing the postero medial surface and runs forward Superficial to the retromandibular vein and external carotid artery the nerve divides into two divisions (i) temparo facial division which gives two terminal branches temporal branch and zygomatic branch (ii) Cervico facial division which gives 3 terminal branches (i) buccal branch (ii) marginal mandibular branch (iii) Cervical branch. The branches of facial nerve supply the muscles of facial expression in the face. The Surgical anatomy explained by so many authors Cawson RA;[6] Hurford F.R.[7] The parotid duct formed in the substance of the gland by the confluence of two main ductules.

It also receives the duct from accessory gland if present. The parotid duct passes to the oral cavity from the anterior border in between upper and lower buccal branches of facial nerve. The diagnostic tool to identify Sailoliths and Stictures is Sailography. The parotid abscesses, benign growths, malignant growths of parotid warrants the Surgeons for special attention for proper care for nerve injury in parotidectomy. Salivary gland neoplasms by EL Sele DW Johns explained in Bailey B.J. edition.[8] Fine needle aspiration is the diagnostic method to rule out the malignant growths of parotid gland Stewart CJ Mac Kenzie; MC Garry et al.[9] Savera et al diagnosed Myoepithelial Carcinoma.[10] Batasakis J.G. gave extensive study on tumors of major Salivary glands.[11] Hobsley M explained the Surgery Parotidectomy by made a colour atlas.[12]

METHODS

The present Study done in 50 foetal glands belongs to 25 (15M+10F) foetuses 10 adult parotid glands from 5 adult Cadavers (4M+1F). The dead foetuses collected and fixed in embalming fluid after getting permission from the concern departments & ethical approval from the H.O.D. of the institute. The fixed foetuses dissected to expose the parotid glands, measurements taken, shapes obtained from the department of anatomy in routein dissection for 1st year M.B.B.S. students in Kurnool medical college, Kurnool.

RESULTS

I. For the shape.

a) 100% of adult parotid glands are Pyramidal shape (10 out of 10 glands).
b) 60% of foetal parotid glands are Pyramidal shape (30 out of 50 glands).
c) 40% of foetal parotid glands are rounded shape (20 out of 50 glands).

II. For apex extention into carotid triangle.

a) 20% of adult glands showed apex extension (2 out of 10 glands).
b) 8% of foetal glands showed apex extension (4 out of 50 glands).

III. For measurements.

a) Length and width is nearly equal in rounded shape glands.
b) Length is more than the width in Pyramidal shape glands.

IV. Accessary Glands.

a) Present in 2 adult glands – 20%
b) Present in 6 foetal glands – 12%.

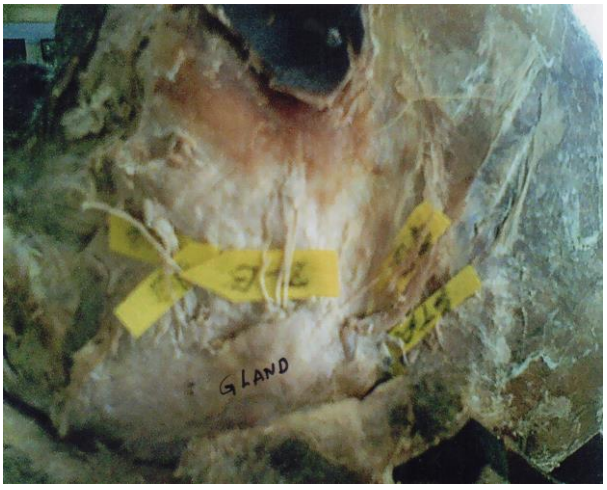

Figure 1: Pyramidal shape parotid gland of adult specimen.

Figure 2: Round shape parotid gland of foetal specimen.

Figure 3: Accessary lobe in adult specimen.

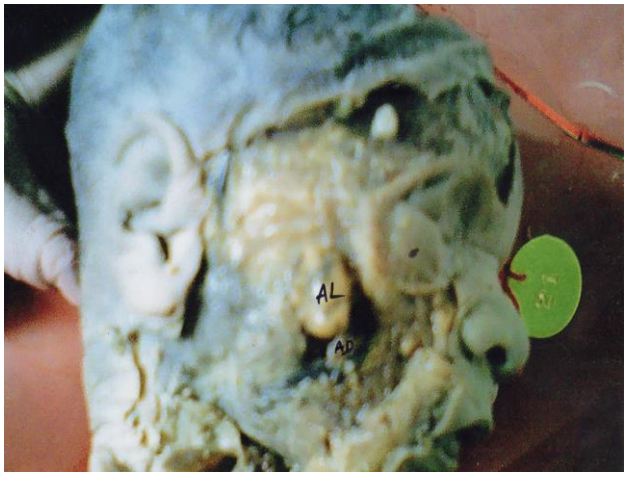

Figure 4: Accessary lobe in foetal specimen.

Figure 5: Apex extention in adult specimen

Table 1: Showing the shapes, extent, accessory lobes in adult specimen on both sides

Sl. No.	Specimen No. with side		Shape of the Gland		Apex Extention to carotid Triangle		Accessary lobe	
			Pyramidal	Round	Extended	Not Extended	Present	Absent
1.	A1	R	P	-	Extended	-	-	Absent
		L	P	-	Extended	-	-	Absent
2.	A2	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
3.	A3	R	P	-	-	N. E	Present	-
		L	P	-	-	N. E	Present	-
4.	A4	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
5.	A5	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent

Table 2: Showing the shapes, extent, accessory lobes in foetal specimen on both sides.

Sl. No.	Specimen No. with side		Shape of the Gland		Apex Extention to carotid Triangle		Accessary lobe	
			Pyramidal	Round	Extended	Not Extended	Present	Absent
1.	F1	R	-	R	-	N.E.	-	Absent
		L	-	R	-	N.E	-	Absent
2.	F2	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
3.	F3	R	P	-	-	N. E	Present	-
		L	P	-	-	N. E	Present	-
4.	F4	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
5.	F5	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
6.	F6	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
7.	F7	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
8.	F8	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
9.	F9	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
10.	F10	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
11.	F11	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
12.	F12	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
13.	F13	R	P	-	Extended	-	-	Absent
		L	P	-	Extended	-	-	Absent
14.	F14	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
15.	F15	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
16.	F16	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
17.	F17	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
18.	F18	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
19.	F19	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
20.	F20	R	-	R	-	N. E	Present	-
		L	-	R	-	N. E	Present	-
21.	F21	R	P	-	-	N. E	Present	-
		L	P	-	-	N. E	Present	-
22.	F22	R	P	-	-	N. E	-	Absent
		L	P	-	-	N. E	-	Absent
23.	F23	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent
24.	F24	R	P	-	Extended	-	-	Absent
		L	P	-	Extended	-	-	Absent
25.	F25	R	-	R	-	N. E	-	Absent
		L	-	R	-	N. E	-	Absent

DISCUSSION

William Warwick and Dayson – Banister in standard Gray's anatomy given about the shapes 50% are inverted pyramidal; 30% are rounded shaped; 20% are irregularly lobulated. In present study 100% adult glands are pyramidal shape. 60% of foetal glands are pyramidal shaped. 40% of the foetal glands are rounded shaped. Irregularly lobulated glands are not seen. The Gray's standard text explained about the apex extention to the carotid triangle is to a variable extent. The present study made an attempt to study the apex extention and it was 10% in adult glands, 8% in foetal glands, regarding accessory lobes it was given as 20% shows accessory lobes. The present study the 2 adult glands showed apex extention out of 10 glands and it is 20%.The foetal glands 6 glands showed apex extention that is about 12%.

CONCLUSIONS

In the present study we are concluding that all the adult glands are pyramidal shaped but the foetal glands are of both pyramidal and rounded shaped; apex extention is in 20% adult glands and 8% foetal glands. The presence of accessory lobes 20% of adult specimens 12% of foetal specimens is noted.

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