



AN ANATOMICAL STUDY OF THE FACIAL NERVE TRUNK AND TERMINAL BRANCHING PATTERN OF FACIAL NERVE IN TELANGANA POPULATION.

Anatomy

Dr. K. Aparna Vedapriya

Professor and HOD, Department of Anatomy, Osmania Medical College, Koti, Hyderabad, Telangana.

Dr. Niveditha Samala*

Assistant Professor, Department of Anatomy, Osmania Medical College, Koti, Hyderabad, Telangana. *Corresponding Author

ABSTRACT

Introduction: The facial nerve is the VII cranial nerve emerges from stylomastoid foramen and passes through the parotid gland. The anatomical knowledge of facial nerve and its terminal branches is important in surgeries of parotid gland, temporo-mandibular joint, cranio-facial trauma & mastoid bone surgeries for successful outcomes.

Aim And Objectives: To study furcation of facial nerve trunk, To study the branching pattern of facial nerve in Telangana population.

Materials & Methods: Present study was conducted on 25 adult human cadavers (50 Hemi faces) in the department of anatomy, Osmania medical college, Hyderabad, Telangana. The study has included well processed and preserved cadavers. The cadavers with facial malformations, pathologies and traumatic injuries of head & neck were excluded from the present study.

Results: In the present study the most frequent type of facial nerve pattern was type-I seen in 38% specimens followed by type III in 30%, type II in 26% specimens and least frequent type was type VI in 04% specimens. In our study type IV & V were not observed. Bifurcation of facial nerve trunk was more frequent, seen in 92% specimens and single trunk was observed in 08% specimens.

Conclusion: In the current study the facial nerve trunk bifurcation and type-I of branching pattern is the most common anatomical pattern of extra temporal facial nerve in Telangana population. The knowledge of anatomical variations is essential for surgeons and neuro physicians to preserve facial nerve and perform safe and uncomplicated procedures with in the parotid region.

KEYWORDS

Facial Nerve, Trunk, Branching Pattern.

INTRODUCTION:

The facial nerve is the VII cranial nerve emerges from stylomastoid foramen and passes through the parotid gland and it is usually bifurcates into upper temporofacial, lower cervico facial divisions both of which further gives rise to five terminal branches like temporal, zygomatic, buccal, marginal mandibular and cervical^[1].

The branching pattern of facial nerve was first described by Davis et al in 1956^[1]. They described six facial nerve types [I to VI] with their recurrence, based on the presence or absence of anastomoses between terminal branches and are as follows^[2].

Type-I: No anastomoses occurred between branches of facial nerve

Type-II: Presence of an anastomotic connection between branches of temporo-facial division

Type- III: A single anastomosis between branches of temporo-facial and cervico-facial divisions

Type-IV: A combination of type II&III

Type-V: Two anastomotic rami passed from the cervicofacial division to intervene with the branches of temporofacial division

Type-VI: Plexiform arrangement, the mandibular branches sent twigs to join any members of temporofacial division.

The anatomical knowledge of facial nerve and its terminal branches is important in surgeries of parotid gland, temporo-mandibular joint, cranio-facial trauma & mastoid bone surgeries for successful outcomes^[3].

AIM AND OBJECTIVES:

To study furcation of facial nerve trunk.

To study the branching pattern of facial nerve in Telangana population

MATERIALS & METHODS:

Present study was conducted on 25 adult human cadavers (50 Hemi faces) in the department of anatomy, Osmania medical college, Hyderabad, Telangana. The study has included well processed and preserved cadavers. The cadavers with facial malformations, pathologies and traumatic injuries of head & neck were excluded from the present study. The study has taken prior approval from the

Institutional ethical committee.

The cadaver was placed in supine position and a block was placed under the back of head to raise it to a convenient angle. A median incision extending from the root of nose to midpoint of chin was made followed by a horizontal incision from the angle of mouth to posterior border of mandible was made. A lower flap reflected downwards to lower border of mandible and upper flaps backwards to auricle^[4]. Skin, subcutaneous tissue & superficial fascia were separated & medially retracted to expose the parotid gland. Further the parotid gland was carefully dissected from the posterior portion until the facial nerve trunk was identified and all terminal branches of facial nerve were traced out.

The furcation and variations in the branching pattern of facial nerve were observed, photographed and are classified according to the six type classification system proposed by Davis et al^[5].

RESULTS:

The present study was conducted on 25 adult human cadavers (50 Hemi faces). Various patterns of facial nerve branches were observed and were described according to Davis et al classification. The results were represented in table no-1 & 2.

Table No-1: Showing Frequency And Percentages Of Branching Pattern Of Facial Nerve.

Type	I	II	III	IV	V	VI
Number	20	13	15	-	-	02
Percentage	40	26	30	-	-	04

In the present study the most frequent type of facial nerve pattern was type-I seen in 38% specimens (Figure No-1), followed by type III in 30% (Figure No-3), type II in 26% (Figure No-2) specimens and least frequent type was type VI in 04% (Figure No-4) specimens. In our study type IV & V were not observed.

Table No-2: Showing Division Of The Facial Nerve Trunk

Division	Single trunk	Bifurcation	Trifurcation
Number	04	46	-
Percentage	08	92	-

In the present study bifurcation of facial nerve trunk was more frequent, seen in 92% specimens (Figure No-1) and single trunk was observed in 08% specimens (Figure No-5). Trifurcation and Quadrification was not found in the present study.

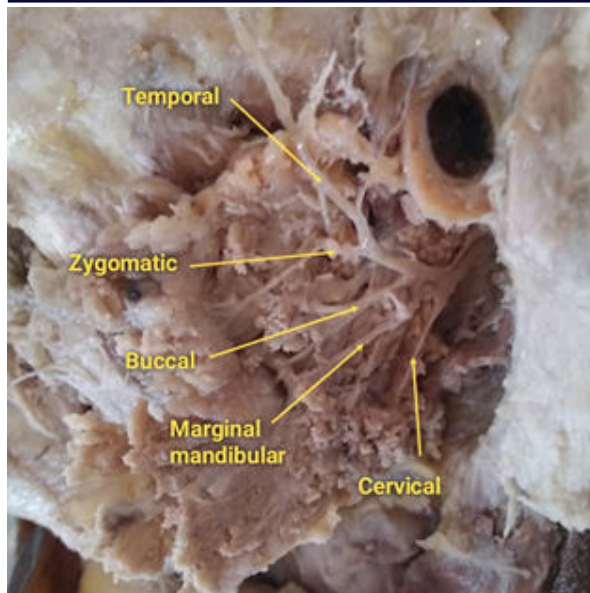


Figure No-1: Type-I pattern of facial nerve. 1

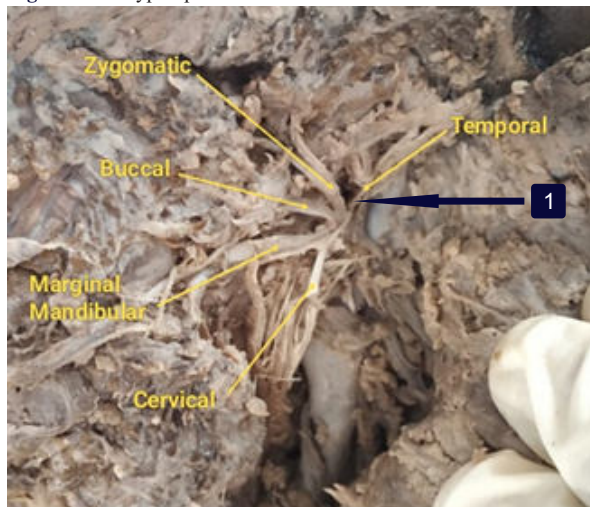


Figure No-2: Type-II branching pattern of facial Nerve. 1. Anastomosis between branches of temporo-facial trunk

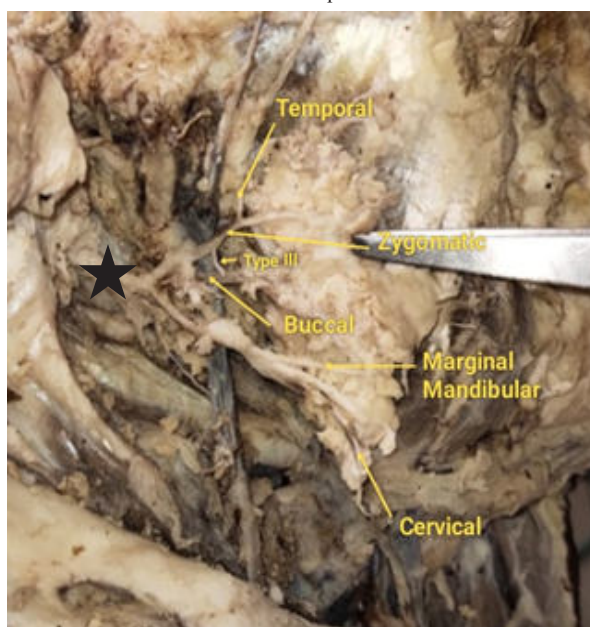


Figure No-3: Type-III pattern of facial Nerve. ★ Trunk of facial nerve

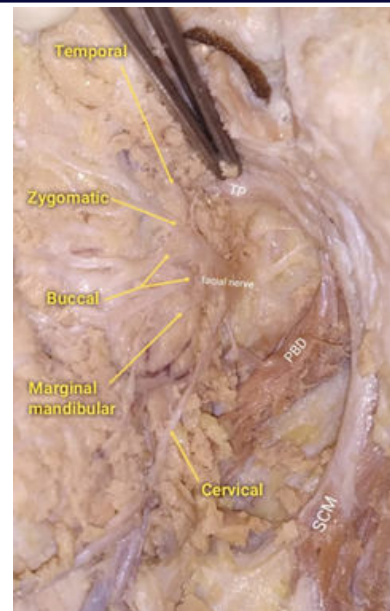


Figure No-4: Type-VI pattern of facial nerve. TP- Tragal point, PBD- Posterior belly of digastric. SCM- Sterno-cleido mastoid

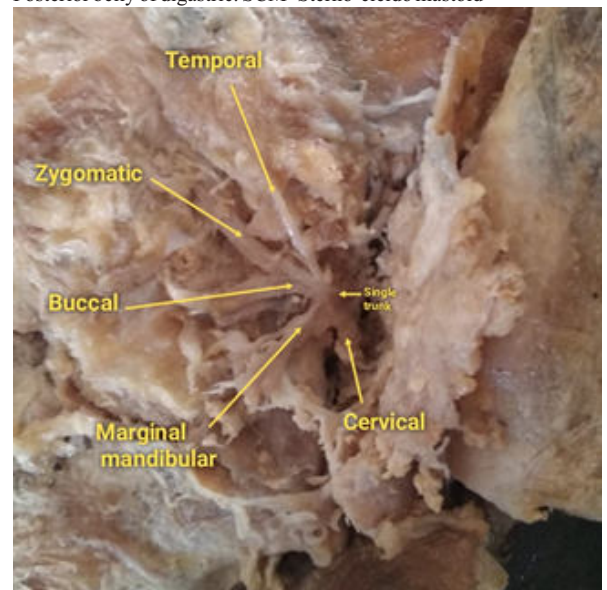


Figure No-5: Single trunk (ST) of facial nerve

DISCUSSION:

The pattern of facial nerve act as a guide during the surgeries of parotid gland to diminish postoperative morbidity associated with facial nerve injury during surgery^[6]. Classification of the terminal branching pattern of facial nerve was done by Davis et al. The present study results were compared with previous studies and were represented in table no-3.

Table No-3: Showing Comparison Of Frequency And Branching Pattern Of Facial Nerve

S.No	Author & Year	I	II	III	IV	V	VI
1.	Davis et al. 1956 ^[7]	13	20	28	24	09	06
2.	Thuku et al. 2015 ^[3]	25	22.5	17.5	15	05	15
3.	Malik et al. 2016 ^[8]	40	15	25	10	05	05
4.	Gaata & Faris et al. 2016 ^[9]	16.2	23.2	30.2	18.6	4.6	6.9
5.	Saida Rana et al. 2017 ^[6]	09	39	20	25	06	01
6.	Kahliq et al. 2017 ^[10]	34.2	14.2	25.7	11.4	8.5	5.7
7.	Present study 2021	40	26	30	-	-	04

Type -I/ The straight branch pattern of facial nerve was observed in 40% specimens, it was the most frequent type in our study. These findings were in accordance with the results of previous studies done by Thuku et al^[3], Malik et al^[8], Kahliq et al^[10].

The division of the facial nerve trunk into upper & lower divisions can take place either before entering the parotid gland or with in the gland^[6]. The bifurcation & location of bifurcation of the nerve trunk may be variable not only between one individual and another but also between the two sides of the main individual^[6]. In the present study single facial nerve trunk was seen in 8% specimens, all five terminal branches were emerging from the single trunk. Bifurcation was observed in 92% specimens in the current study. The present study results were compared with previous studies, represented in tableno-4.

Table No-4: Showing Comparison Of Division Of Facial Nerve Trunk

S.No	Author & Year	Single trunk	Bifurcation	Trifurcation
1.	Davis et al. 1956 ^[7]	-	100	-
2.	Khaliq et al. 2016 ^[10]	91.4	8.6	-
3.	Saida Rana et al. 2017 ^[6]	02	95	03
4.	Present study 2021	08	92	-

CONCLUSION:

In the current study the facial nerve trunk bifurcation and type –I of branching pattern is the most common anatomical pattern of extra temporal facial nerve in Telangana population.

The knowledge of anatomical variations is essential for surgeons and neuro physicians to preserve facial nerve and perform safe and uncomplicated procedures with in the parotid region.

Conflicts Of Interest: None

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