



Study of Elongated Styloid Process in Dry Human Skulls and its Clinical Importance.

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ABSTRACT

Aim and Objective: The objective of present study is to know the incidence of elongated styloid process and to determine the average length of styloid process.

Materials & Method: The present study was conducted on 110 dry human skulls of unknown age and sex taken from Anatomy Department at B. J. Medical College, Civil Hospital, Ahmedabad and GMERS Medical college, Gandhinagar.

Results: Out of 110 unknown dry human skulls, 16(14.5%) had elongated styloid process.

Conclusion: Knowledge from the present study will be helpful to the clinicians, dentists and otolaryngologists for treatment of Eagle's syndrome.

KEYWORDS : Elongated styloid process, Eagle's syndrome.

Introduction:

Styloid process is a slender projection of bone that arises from the inferior surface of the temporal bone just beneath the external auditory meatus(1,2). The normal adult styloid process length :20mm to 30mm(3).

The attached structures to the styloid process include; the stylopharyngeus, the stylohyoid, the styloglossus muscles and the stylohyoid ligament that reaches the hyoid bone(6,7).

Embryologically, the styloid process, the stylohyoid ligament and the lesser cornu of the hyoid bone are developed from the second branchial arch called Reichert's cartilage. Because it is of cartilaginous origin, the ligament has the potential to mineralize.¹⁵ Elongated styloid process means longer than 30.0 mm (6,7).

Clinical significance:

Many important vessels and nerves are present near the styloid process in the head and neck region like: Carotid arteries, Facial nerve, Glossopharyngeal nerve, Accessory and vagus nerves.

The stylohyoid ligament (SHL) arises from the SP tip and attaches to the lesser cornu of the hyoid bone. This anatomic complex, collectively termed the stylohyoid chain, is important in the aetiology of stylohyoid syndromes(10).

The elongation of styloid process is considered an anomaly which can be accompanied by calcification of the stylohyoid and stylo-mandibular ligaments, which can lead to a series of symptoms such as dysphasia, Odynophagia, facial pain, ear pain, headache, tinnitus, Trismus. This set of symptoms associated with the elongated styloid process is called Eagle's syndrome(18).

Aim of the study:

- To know the incidence of elongated styloid process.
- Determine the average length of styloid process.

- Clinical significance of the styloid process.

Materials and Methods:

- The present study was conducted on 110 dry human skulls which were obtained from B. J. Medical College, Civil Hospital, Ahmedabad and GMERS Medical college, Gandhinagar.
- The skulls that had broken styloid process and gross pathological deformities were excluded from the study.
- Digital vernier caliper –to measure length. Measurement taken from the base of the skull to the apex of each Styloid process



Fig 1: Length of the styloid process of the skull: from the base of the skull to the apex of each SP.

Result:

Results of present study showed that out of 110 skulls, 16 skull had length of styloid process more than 30mm. Results of present study are as per table 1, 2

Table 1: the incidence of variation in length of Styloid process

Length of Styloid process	No of skull	Percentage
1 – 10 mm	0	0%
11 – 20 mm	24	21.8%
20 – 30 mm	70	63.7%
> 30 mm	16	14.5%

Table 2: the incidence of elongated of Styloid Process

Total No. Of skulls	110
No of skull in which Styloid Process is Elongated	16 (14.5%)

Discussion:

The Styloid process is a slender projection of bone that arises from the inferior surface of the temporal bone just beneath the external auditory meatus. The normal adult Styloid process length is considered to be between 20mm and 30mm(12).

Eagle (1937) described the syndrome and stated that the normal styloid process is approximately 2.75 cm and any styloid process beyond that may be considered elongated. Eagle divided the syndrome into two categories. He described the classic syndrome as persistent pain in the pharynx, aggravated by swallowing with the pain frequently referred to the ear on the side of the elongated styloid process. He also noticed increased salivation, hesitancy, difficulty in swallowing, gagging and a foreign body sensation(1).

Keur et al(1986) stated that radiological appearances of styloid process more than 30mm is considered to be elongation of styloid process(3).

Paraskevas GK(2009) reported a case of unilateral elongated styloid process with a length of 5.8cm in dry skull of male cadaver. This body when he was alive had complained ipsilateral otalgia probably due to compression of nerves due to elongated styloid process(14).

Bilodi AKS (2013) studied 300 unknown dry human skulls. Out of them, 61 skulls had elongated styloid process with a incidence was

2.03%. The length of elongated styloid process was ranging from 3.6 to 5.5cms. There were 17 skulls {27.86%} were laterally angulated five {8.19%} medially angulated and rest 39{63.98%} were straight. There were 12 skulls{19.67%} having elongated styloid process on one side while 49 skulls(80.27%) had elongated styloid process on both sides.28 {45.90%}(13).

Gulnara SCAF(2003) reported 166 panoramic radiographs patients. he observed elongated styloid process in 12.6%, and it was similar in both genders(15).

Phennapa et al(2012) done study on 176 Thai dry and 150 cadaveric skulls showed the mean length of all styloid process to be 24.12±7.28mm. Out of all styloid process, 18.40% were elongated styloid process(11).

That B et al has reported that in Indian subjects, length of styloid process on the left side varied from 0.8cm to 2.4cm.while average length of styloid process on the left and right side were 1.52cm and 1.59cm respectively(19).

We reported out of 110 skulls,16 (14.5%) skull had elongated styloid process.**Conclusion:**

Abnormal elongation of the styloid process may cause compression on a number of vital vessels and nerves related to it producing clinical conditions that include: continuous chronic pain in the pharyngeal region,dysphasia,radiating otalgia,,radiating pain into the orbit and maxillary region,secondary glossopharyngeal neuralgia,phantom foreign body sensation {Globus hystericus}(16)

Eagle's syndrome is an uncommon but important cause of chronic head and neck pain(16). The elongated styloid process if present may get fractured following trauma (hanging) or spontaneously(8).

In elderly patients with history of repeated pain in the face and neck, then there is possibility of presence of elongated styloid process. This can be confirmed radiologically after thorough clinical examination(17)

Early diagnosis of asymptomatic elongated styloid process has to be made. Awareness of the elongated styloid process is important in the field of Dentistry, Otolaryngology, Surgery & Radiology.

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