Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20171201

A clinical study of the patients with elongated styloid process

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Received: 03 February 2017 **Accepted:** 06 March 2017

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ABSTRACT

Background: The elongation of styloid process is considered an anomaly which can cause throat pain and cervico-facial pain and trigger a series of symptoms such as dysphagia, odynophagia, facial pain, ear pain, headache, tinnitus and trismus. The present study was undertaken find out the length of styloid process in patients with throat pain.

Methods: A prospective study was conducted among 150 patients. A detailed ENT and general examination was done apart from palpation of the styloid along the posterior tonsillar pillar, a routine Hematological tests with estimation of serum calcium levels, and X-ray towne view was done.

Results: The female to male ratio was found to be 1.6:1. Of the 150 cases 92 were middle aged females, the severity of symptoms were directly proportional to the length and the thickness of the styloid. The symptoms ranged from foreign body sensation in the throat to cervicofacial pain and otalgia. Serum Calcium levels were elevated in 60% of the cases.

Conclusions: Elongation of the styloid being multi-factorial in origin. A strong suspicion is required on the part of the surgeon to rule out this particular entity. A simple palpitation and an x- ray Towne view can establish the diagnosis of elongated styloid process.

Keywords: Throat pain, Cervicofacial, Styloid process, Towne view

INTRODUCTION

Styloid process is derived from the Greek word "Stylos" means a pillar, which is normally a cylindrical structure arising from the temporal bone anterior to stylomastoid foramen. The apex of the styloid process is clinically important as it is located between internal and external carotid arteries. The embryonic origin of styloid process lies in the Reichert's cartilage of the second pharyngeal arch, together with the stylohyoid ligament and the lesser horn of hyoid bone forms an apparatus called stylohyoid apparatus or stylohyoid complex. The styloid process provides attachments to stylohyoid and stylomandibular ligaments and stylopharyngeus, stylohyoid and styloglossus muscles.

These muscles and ligaments have a role in mastication and swallowing. This is surrounded by glossopharyngeal nerve, and carotid arteries. ^{4,5}

The mean radiographic length of the styloid process is usually 2-3 cm and can vary from person to person and even between the same side of the same individual.⁶ When the processes exceed this average it is assigned the term elongation.²

The elongation of styloid process is considered an anomaly which can be accompanied by calcification of the stylohyoid and stylomandibular ligaments, which can trigger a series of symptoms such as dysphagia, odynophagia, facial pain, ear pain, headache, tinnitus and trismus. This set of symptoms associated with the elongated styloid process is called Eagle's syndrome.⁷

The present study was undertaken to establish a corelation between throat and cervicofacial pain and elongated styloid process. The present study was undertaken find out the length of styloid process in patients with throat pain.

METHODS

The present observational study was conducted in the department of ENT, R I M S, Raichu from December 2015 to March 2016. Total 150 patients were enrolled with age distribution ranged from 15 years to 70 years. There were 92 females and 58 males in this study. The patients who reported with throat pain, foreign body sensation in the throat and cervico-facial pain were selected for the study. Ethical permission was obtained from the institution and informed consent was obtained from the patients. The inclusion criteria consisted of patients with throat and cervicofacial pain without other oro-pharyngeal pathology. Patients reported with throat pain with pharyngitis, tonsillitis, oro-pharyngeal ulcers and oro-pharyngeal malignancy were excluded from the study. Styloid process was assessed by palpation and by using Towne view x-ray techniques (figure 1). The results were analyzed and depicted by using bar diagrams.

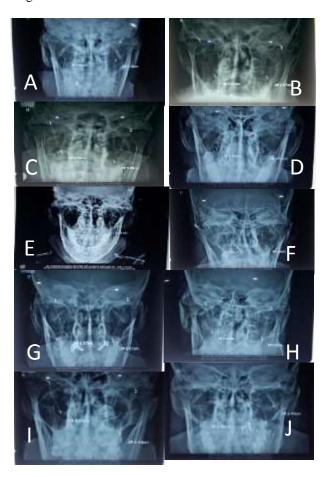


Figure 1: Towne view showing elongated styloid ranging from 3 cms to 6 cms.

RESULTS

The female to male ratio was found to be 1.6:1. Of the 150 cases 92 were middle aged females, the severity of symptoms were directly proportional to the length and the thickness of the styloid. The symptoms ranged from foreign body sensation in the throat to cervico facial pain and otalgia. Serum Calcium levels were elevated in 60% of the cases.

Table 1 is shows the length of right sided styloid process in which length of the styloid process ranged between 2.5 cm to 3.5 in 43 females and 17 males, ranged between 3.6- 4.5 cm in 47 females and 25 males, between 4.6-5.5 cm length in 4 females and 12 males and in none of the female ranged more than 5.5 cm but 2 male patients revealed 5.6-6.5 cm of length styloid process at right side (Figure 2). Table 2 is shows the length of left sided styloid process in which 44 female and 19 male have range between 2.5 cm to 3.5, in 45 female and 26 male patients, it ranged between 3.6- 4.5 cm, in 4 female and 11 male it ranged between 4.6-5.5 cm length and none of female ranged more than 5.5 cm but 1 male have 5.6-6.5 cm of length styloid process at left side (Figure 3).

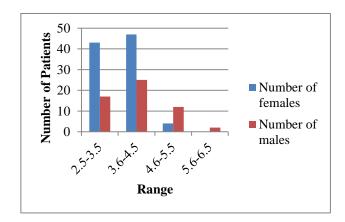


Figure 2: The male and female distribution according to length of styloid process on the right side.

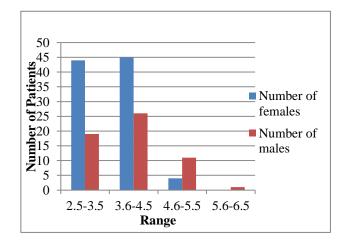


Figure 3: The male and female distribution according to the length of styloid process on left side.

Table 1: The male and female distribution and length of styloid process on the right side.

Right- sided styloid process			
Range (in cms)	Number of females	Number of males	
2.5-3.5	43	17	
3.6-4.5	47	25	
4.6-5.5	4	12	
5.6-6.5	0	2	

Table 2: The male and female distribution and length of styloid process on the left side.

Left- sided styloid process		
Range (in cms)	Number of females	Number of males
2.5-3.5	44	19
3.6-4.5	45	26
4.6-5.5	4	11
5.6-6.5	0	1

DISCUSSION

The styloid process is a bony projection, situated immediately anterior to the stylomastoid foramen, averaging from 2 to 2.5 cm in length. It is of cylindrical form and projects downwards from the inferior surface of the temporal bone towards the front, downwards and medially narrowing towards the tip. The location of the tip is particularly is important, which is situated between the internal and external carotid arteries, laterally from the pharyngeal wall and immediately behind the tonsil fossa.⁸

Patients most often complain of pain in the pharynx, a sensation of the presence of a foreign object (fish bone), pain on swallowing which radiates to the area of the ear on the same side. Clinically, hardness can occasionally be felt in the tonsillar fossa which is painful on palpation. ⁹ It is supposed that this symptoms and signs are due to the compression of the SP on some neural and vascular structures. More uncommonly, symptoms such as dysphagia, tinnitus, and otalgia may occur in patients with this syndrome. 10 Diagnosis is made both radiographically and by physical examination. Palpation of the styloid process in the tonsillar fossa is indicative of elongated styloid in that processes of normal length are not normally palpable. Palpation of the tip of the styloid should exacerbate existing symptoms. 11 If the styloid process causes pressure on the area of the carotid arteries, the symptoms are more complicated. Pain may occur in the areas that supply the internal and external carotid arteries. In the case of affection of the external carotid, the case history records buzzing in the ears, pain during movement of the head and pain in the anterior neck triangle. Symptoms with regard to the internal carotid may be headache in the area of the orbit and other areas that supply that artery. Although the elongated styloid

process is usually bilateral, the symptoms and disturbances are most frequently unilateral.⁹

Clinically, the syndrome is most commonly seen after the age of 30 years. There is no significant sex predilection in occurrence of mineralization of the styloid process, however, symptoms are more common in females. ¹² In the present study, the female to male ratio was found to be 1.6:1. Of the 150 cases 92 were middle aged females, the severity of symptoms were directly proportional to the length and the thickness of the styloid. The symptoms ranged from foreign body sensation in the throat to cervico facial pain and otalgia.

The patients with the length between 2.5 cm to 3.5 cm complained of the foreign body sensation in the throat. The patients with the length between 3.6 cm to 4.5 cm complained of throat pain, pain in the ear, and pain in the throat on changing the position of the head, pain aggravated on swallowing. The patients with the length between 4.6 cm to 6.5 cm complained of throat pain, pain in the ear, and pain in the throat on changing the position of the head, pain aggravated on swallowing and cervicofacial pain mimicking glossopharyngeal neuralgia secondary to impingement of the glossopharyngeal nerve. The elongated styloid process showed a female preponderance with 61% cases reported among females. This was comparable with the study conducted by Bafageeh S A. 13 Some of the studies have shown the entrapment the chorda tympani, trigeminal and the glossopharyngeal nerves, but our study did not reveal about the involvement of the chorda tympani. 14 It has been suspected that an elongated styloid process could be caused by congenital elongation of the styloid process due to persistence of the cartilaginous analogue of the Styloid, calcification of the stylohyoid ligament by unknown mechanism and growth of osseous tissue at the insertion of the stylohyoid ligament.¹⁵ 60% of our cases show a raised calcium levels.

Rathva et al determined the mean length of the styloid process on 150 dry skulls to investigate the incidence of the elongated styloid process and the relations of the styloid processes to other structures at the base of the skull and found elongated styloid process in upto 2% of dry skull.¹⁶

The prevalence of styloid process elongation or stylohyoid ligament mineralization in imaging studies has been reported to be between 19.4% to 52.1% in the general population5 and in up to 76% of patients with temporomandibular disorder8. However, the incidence of Eagle syndrome in the general population is underestimated since only 6% of those with an elongated styloid process have symptoms. ¹⁷

CONCLUSIONS

Elongated styloid process can be a source of craniofacial and cervical pain and remains a diagnostic challenge to many.¹⁸ The diagnosis could be established by detailed history taking, palpation of the styloid and radiological (Towne) view The presence of the elongated styloid process and its angulation, though rare, does highlight the importance of routine examination of the styloid process even in clinical practice.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Choudhari SY, Sangavi AB. A clinical study of the patients with elongated styloid process. Int J Otorhinolaryngol Head Neck Surg 2017;3:400-3.