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## **Bilateral, Elongated Styloid Process in A Dry Skull; its Clinical Implications: A Case Report**

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### **Abstract**

The styloid process of temporal bone is a slender, elongated, conical bony projection that lies anteromedial to the mastoid process. Its length normally varies from 2-3 cm, and a styloid process longer than 3 cm is found in 4 to 7% of the population. During the routine osteological study of the skull, we came across a skull with bilateral elongated styloid process. The length of the process on the right side was 5.3cm and on the left 5.2cm and the thickness around the base was 1cm bilaterally. The elongated styloid process is recognised as one of the causes of pain in the cranio-cervical region and is one of the causes of Eagle's syndrome. Eagle syndrome, or elongated styloid process syndrome, is associated with such symptoms as chronic facial and neck pain, dysphagia, tinnitus, referred pain in the ear, glossopharyngeal neuralgia, orbital pain, and radiating pain in the maxillary regions, which worsen when the head rotates or the tonsillar fossa region is palpated. Awareness about an elongated styloid process is important for otolaryngologists, radiologists, surgeons and dentists.

**Key words: Styloid process, Eagle syndrome, Elongated.**

### **Introduction**

An elongated styloid process may compress on the vital neurovascular structures that are in its close vicinity and give rise to symptoms related to the compression of nerves (trigeminal,, facial, glossopharyngeal Vagus and accessory nerve) or, symptoms of compression of carotid arteries, which were first described by an Otolaryngologist Watt Eagle[1]. (1937).

The exact cause of an elongated styloid process is not yet determined, however the most accepted hypothesis is the ossification of the stylohyoid ligament that attaches the styloid process to the lesser cornu of hyoid bone, which may occur as a result of a congenital variation, local reactive metaplasia after local trauma, calcification, or the ageing process.

Its length normally varies from 2-3 cm. There is no consensus, regarding the maximum limit of length of the styloid process; some researchers have reported the maximum upper limit to be 3 cm [2] [3]. However, some other reports proposed that the SP should be considered elongated when its length exceeded 4.5cm [4] [5].

The length of the styloid process has been studied by several researchers in dry skulls, in cadavers, in computed tomography and in radiographs [6] [7][8] [9] [10][11].

Although approximately 4%-7% of the population is thought to have an elongated styloid process, only a small percentage (between 4 and 10.3%) of this group is thought to be symptomatic [12][13]. The typical patient with an elongated styloid process is a female between the ages of 30 and 50 years. There is a 3:1 female predominance in ES [14].

Some researchers have shown that SPE was not the only reason of the symptoms and signs, and they suggested that it's the increased medial or anterior angulation that makes the elongated styloid process the sole cause of Eagle's syndrome [15][16].

### Case Finding

During the routine osteological study of the skull, we came across a skull with bilateral elongated styloid process. The length of the process on the right side was 5.3cm and on the left 5.2cm and the thickness around the base was 1cm bilaterally.



**Figure 1: Abnormally large styloid process on right side**



**Figure 2: Abnormally large styloid process on left side.**

## Discussion

Eagle described two distinct syndromes related to an elongated styloid process :1. Classic Syndrome- which included symptoms of pain in head and neck, dysphagia, Otagia, facial pain when turning the head, foreign body sensation in throat. It is associated in most cases with tonsillectomy that may have been performed many years earlier. Several researchers have reported cases where patients presented with symptoms of classic syndrome and have added some more symptoms such as tinnitus, radiating pain into the orbit or maxillary region to the clinical presentation of the classical syndrome.

The second type, the carotid artery syndrome, usually is not associated with tonsillectomy. The carotid artery syndrome is caused by impingement. It includes pain along the distribution of the carotid artery, due to irritation of the sympathetic plexus around the carotid artery. Cases of elongated styloid process associated with symptoms of Horner's syndrome, transient ischaemic attacks and sudden death attributed to compression of both carotid sinuses have been reported [17] [18] [19].

The diagnosis of ES must be based on a good medical history, physical examination and confirmed by radiological investigations. It should be possible to feel an elongated styloid process by careful intraoral palpation, placing the index finger in the tonsillar fossa and applying gentle pressure [20]. If pain is reproduced by palpation and either referred to the ear, face, or head, the diagnosis of an elongated styloid process is very likely. A styloid process of normal length is usually not palpable. Injection of local anaesthetic into tonsillar fossa relieves pain and can be used as a diagnostic tool[21].

The factors such as variability in the clinical presentation, non-specific symptoms, an elongated styloid process is often asymptomatic, and scant knowledge about this clinical entity makes the diagnosis often challenging for the clinician and very often the diagnosis is delayed.

## **Conclusion**

Symptoms related to an elongated styloid process can be confused or mistaken for many other conditions that must be excluded. Otolaryngologists, neurologists and dental surgeons should be aware of the existence and incidence of this clinical entity, which can be confused or mistaken for many other conditions, which can be excluded by proper and detailed history, physical examination and radiological investigations. The symptoms related to Eagle's syndrome can be confused with those attributed to a wide variety of facial neuralgias or oral, dental and temporomandibular diseases. Awareness about an elongated styloid process is important for otolaryngologists, radiologists ,surgeons and dentists.

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