

Bilateral elongated styloid process: report of a dry skull

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Abstract: Temporal styloid process is a thin, fragile, pointed bony projection directed forward and downward with average length of 2 to 2.5 cm. The authors describe a skull with two enlarged styloid processes, found in the osteotheque of the Faculty of Medicine of the Eduardo Mondlane University. The objective of this presentation is to draw the attention of the medical community to the existence of these situations that in real life give different and non-specific symptoms that can make one think of another diagnosis. The clinical picture of Eagle's Syndrome ranges from asymptomatic cases to cases with great discomfort, with variable and non-specific symptoms, due to its close relationship with the vasculonervous bundle of the neck and other cranial nerves and its knowledge is important for the student of anatomy, anatomist, general practitioner, dentist, radiologist, neurologist, maxillofacial, neurosurgery, otolaryngologist and psychiatry.

Keywords: Eagle Syndrome; Styloid Process; Clinical Anatomy; Case report.

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1. Introduction

The styloid process is a thin, fragile, and pointed bony projection directed forward and downward, welded to the posteroinferior face of the cliff, but embryologically it is independent of it [1] and develops from the second pharyngeal/brachial arch, designated as Reichert's cartilage because of its cartilaginous origin. It belongs to the hyoid apparatus and gives insertion to the elements of Riolo's bouquet, consisting of two ligaments stylomandibular and stylohyoid and three muscles stylopharyngeus, stylohyoid and styloglossus [1][2].

The styloid process has an average length of 2 to 2.5 cm and when it exceeds 4 cm in length it is considered elongated, an anomaly [2]. The styloid process has a variable length and is often broken from handling during classes or even missing [3], because the styloid process is thin, sharp, and fragile and affects students because they are deprived of observing this structure during classes. Specific orofacial pain secondary to elongation of the styloid process or calcification of the stylohyoid ligament is known as Eagle's syndrome, in honor of the otorhinolaryngologist who described it [4].

This case report description followed CARE guidelines [5].

2. Case Report

When analyzing the bone head from the osteotheque of the Anatomy Laboratory of the Faculty of Medicine of the Eduardo Mondlane University, we found that the bony head of a man of approximately 40 years old presented the two elongated styloid processes. The styloid processes were measured using a digital caliper with 0.01mm

precision. The right styloid processes measured 41.7 mm and the left 40.3 mm. Photographs were taken of different faces and their reported characteristics (Figure 1 and Figure 2).



Figure 1: Left Lateral View Illustrating Elongation of the Styloid Processes.



Figure 2: Inferior view of the base of the skull illustrating the styloid processes.

4. Discussion and conclusion

There are few studies that address the incidence of the styloid process in the population general population or in specific regions and varies from 4% to 72.5%. Rinaldi postulates that true incidence is about 0.16% [4]. Concerning gender distribution of the elongated Styloid Process, the elongation is more frequent in females than in males (3:1). Bilateral involvement is quite common but does not always involve bilateral symptoms. No significant difference is detectable between the right and left sides [4]. It is more common in adults over 30 years of age.

Table 1: Description of cases of accidents with foreign bodies of instrumental origin in clinical dental practice.

Country	Incidence	Reference
Spain (Barcelona)	72.75%	[6]
Spain	20.49%	[7]
Pakistan	14%	[8]

Turkey (Eastern Aegean)	7.01%	[9]
Siria	4.52%	[10]

The enlarged styloid process interferes with neighbouring neurovascular structures, such as the internal carotid artery, internal jugular vein and cranial nerves (trigeminal, facial, glossopharyngeal and vagus) and the patient may be asymptomatic or have discrete symptoms such as recurrent and non-specific discomfort of the pharynx, foreign body sensation to more bothersome symptoms such as dysphagia, pain and increased salivation [11], pain in the tonsils and upper neck that radiates to the ipsilateral side of the ear and is worse when swallowing [12] that make us think of other diagnoses and therefore, every doctor and dentist should remember this nosologically entity because it is often neglected.

The pain may be exacerbated by swallowing or by turning the head and affect the quality of life of the patients. Differential diagnosis must be made with the following conditions:

- Glossopharyngeal neuralgia with severe pain, usually lancinate and lasting momentarily, but recurrent and frequently stimulated by thermal changes of hot/cold and some movements of the pharynx and tongue [13]
- Trigeminal neuralgia characterized by trigger zones producing sudden, short-lasting severe pain along the branches of the trigeminal nerve [13]
- Neuralgia of sphenopalatine ganglia [14]
- Laryngopharyngeal dysesthesia [14]
- Temporomandibular arthritis [14]
- Cervical vertebral arthritis [14]
- Temporal arteritis, which produces a burning or throbbing pain that may be localized over the protuberance of the affected temporal artery, which may cause pain in the eye region, photophobia, diplopia and eventual blindness [13]
- Migraine, which is characterized by periodic headache, dizziness, nausea, photophobia and light flickering appearance [13]
- Histaminic cephalgia which is characterized by being regular and recurrent, brief, over the distribution territory of the carotid artery and produced by vasodilation caused by histamine, associated with tearing, skin flushing and runny nose [13]
- Cluster type headache [14]
- Migraine-type headache [14]
- Myofascial pain and dysfunction syndrome, which may reflect a masticatory muscle spasm initiated by overcontraction, overextension, or fatigue, is more likely to be found in women and produces symptoms of pain, muscle inflammation, trismus and clicking sounds in the temporomandibular joint [13]
- Impacted third molars [13]
- Dental malocclusion [14]
- Chronic Pharyngoamigdalitis [14]
- Oesophageal diverticulum [13]
- Hyoid bursitis [14]
- Sluder's syndrome [14]
- Benign or malignant neoplasms [14]

Regional pharyngeal tenderness or headache results from carotid artery or carotid pain from impingement of the styloid process on the carotid artery. Due to the variability and non-specific nature of symptoms, patients often seek treatment from different medical specialties, including otolaryngology, family practice, neurology, neurosurgery, psychiatry, and dentistry [14], therefore, it is extremely important that these specialties know how to diagnose this syndrome.

The diagnosis can be clinical through transoral palpation of the styloid process in the tonsillar fossa or imaging, through skull radiography, anteroposterior view, with the mouth open and lateral view [12], Panoramic x-ray and CT scan. This article was evaluated and approved by the institutional health bioethics committee of the faculty of medicine and the central hospital of Maputo (CIBS FM&HCM/068/2023). The clinical picture of Eagle's Syndrome ranges from asymptomatic cases to cases with great discomfort, with variable and non-specific symptoms, due to its close relationship with the vasculonervous bundle of the neck and other cranial nerves and its knowledge is important for the student of anatomy, general practitioner, dentist, radiologist, neurologist, maxillofacial, neurosurgery, psychiatry.

The therapeutic approach depends on the presence or absence of symptoms, asymptomatic patients do not require treatment and in symptomatic patients it may be necessary to perform transoral excision or a cervical approach [12]. Each procedure has advantages and disadvantages. Intraoral approach has advantages (i.e., avoids external scarring and less surgical time) and disadvantages (i.e., risk of deep space neck infection, poor visualization of the surgical field, major risk of iatrogenic injury to main neurovascular structures, poor hemorrhage control, speech and swallowing disorders for postoperative oedema and trismus). The extraoral approach has advantages (i.e., better visualization of the surgical field and greater intraoperative sterility) and following disadvantages (i.e., more time-consuming and risk of injury of facial nerve structures).

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Conflicts of Interest: None.

Supplementary Materials: None.

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