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STYLOCAROTID SYNDROME: A 3DCT PERSPECTIVE

Dental Science

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ABSTRACT

Stylocarotid syndrome is characterized by a set of symptoms caused by an elongation of the styloid process and/or the mineralization (calcification or ossifications) of the stylohyoid and/or stylomandibular ligaments. The symptoms can be variable, affecting the masticatory system and maxillofacial region as well as the head and neck, often leading to a misdiagnosis. Here we present a literature review and a case report of stylocarotid syndrome.

KEYWORDS:

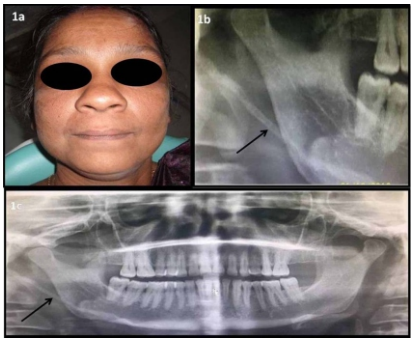
Eagle's syndrome, styloid process, dysphagia, review

Introduction

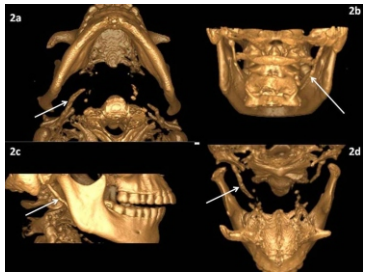
Watt W. Eagle first described the clinical findings of Eagle syndrome in 1937. [1] Eagle's syndrome encompasses multiple symptoms, which include pharyngodynia, dysphagia, foreign body sensation in pharynx, otalgia, headache, pain on neck rotation, and facial pain. These symptoms are produced due to elongated styloid process (SP) or calcified stylohyoid ligament exerting pressure symptoms on neurovascular structures in its vicinity. Normal length of SP varies from 2.5 cm to 3.0 cm and it is said to be elongated if its length exceeds 3.0 cm.[2] Estimated incidence shows that an average of 4% of population has elongated process, but only 4-10.3% of these individuals presents with symptoms.[3] However, the number of reported cases is underestimated because it is an incidental finding in radiographs and is usually asymptomatic. Diagnosis is supported by description of symptoms by patient, previous history of any cervical trauma and tonsillectomy, physical examination, and radiographs. Treatment includes both non-surgical and surgical approaches.

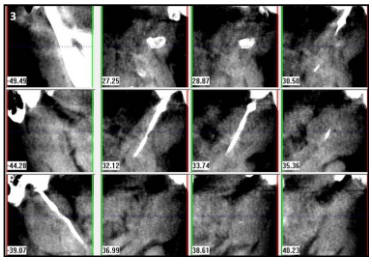
Case Report

A 45yrs old female patient reported the outpatient department with a chief complaint of pain in the right lower back jaw region since 1 year. Pain was gradual in onset, sharp, shooting and intermittent that aggravated on moving the head laterally and radiated to right ear, head and nape of neck. Besides this, the patient also gave history of tinnitus and dysphagia. There was no history of any surgical intervention (Fig 1a).



Tenderness was elicited on the right oro-pharyngeal area in tonsillar fossa on intraoral palpation. Clinical examination led to a provisional diagnosis of neuralgic pain with elongated styloid process. The patient was then subjected to a series of radiographic examinations in the form of Lateral oblique, Panoramic radiograph, 2DCT and 3DCT. Right Lateral oblique body view revealed the presence of elongated styloid process(Fig 1b). Panoramic radiography revealed elongated right styloid process i.e. 38 mm in length with pattern E as described by Tyagi et al(Fig 1c).[1] 3DCT and 2DCT from different views confirmed the elongation of right styloid process(Fig 2 and 3)





thereby confirming it to be stylocarotid syndrome. Serum calcium and phosphorous levels were within normal range. Patient was further motivated for styloidectomy but didn't turn up for the same.

Discussion

SP is a small tapering projection from the base of temporal bone lying anteriorly to mastoid process. Muscles and ligaments attached to it play a role in mastication and swallowing.

Vital structures lying in close proximity to it are internal and external carotid artery, internal jugular vein, glossopharyngeal, hypoglossal, and vagus nerve. Elongated SP giving rise to clinical symptoms of cervico-facial pain is known as Eagle's syndrome.

Pain from elongated SP is due to “Constant mechanoreceptor discharge in area of V, VII, IX, X cranial nerve endings” initiated by mechanical irritation from SP.[4] The compression depends on the size, shape, and orientation of ossified the SP.[5]

Eagle syndrome also known as stylocarotid artery syndrome was first described by Watt W Eagle in 1937[2] and comprised of variety of symptoms ranging from pharyngodynia, dysphagia, foreign body sensation, otalgia, headache, pain on neck rotation, facial pain or even stroke.[3] A palpable mass may be observed in the tonsillar fossa, its palpation sometimes exacerbating the patient's symptoms. Symptoms include ear pain, neck pain extending to the oral cavity and the maxilla. Dysphonia, dysphagia, odynophagia, persistent sore throat, the sensation of a foreign body in the pharynx, painful trismus <25 mm, vertigo and tinnitus are other symptoms. Pain is also observed when

turning the head or extending the tongue. Apart from turning the head, yawning can also trigger symptoms, particularly those resembling migraine.[6] Other symptoms may include tongue pain in general, a sensation of increased salivation, alterations in taste, vocal changes,pain in the upper limbs, chest, and temporomandibular joint, facial paresthesia, pharyngeal spasm, pain triggered by the movement of the mandible, cough, dizziness, or sinusitis. Eagle's syndrome has also been reported as the most important cause of secondary glossopharyngeal neuralgia, or atypical craniocervical pain.[7,8,9] All of these symptoms are attributed to the irritation of cranial nerves V,VII, IX or X, all of which are situated very close to the styloid process[2]. Normal length of styloid process varies from 25mm to 30mm, once it reaches greater than 30mm it is said to be elongated.[2] Mineralisation of stylohyoid ligament complex is divided into two subtypes: 1. *Classic syndrome* due to fibrous scar tissue causing damage to the cranial nerve endings non tonsillar bed after tonsillectomy and 2. *Stylocarotid syndrome* which is unrelated to tonsillectomy and is caused by compression on the external and internal carotid artery.[4]

Radiographs are the confirmatory tool after examination. Conventional radiographs, which can be used, are panoramic radiograph, posteroanterior skull view, lateral cephalogram, lateral oblique mandible view, Towne's view. However, moreover conventional radiographs have inherent drawback of superimposition of anatomical structures, and hence reducing the diagnostic information. CT imaging overcomes all drawbacks of conventional radiographs.

However, no 2D-CT image provides exact value of length of SP because no plane of image is exactly parallel to the SP leading to underestimation of the length.

Moreover 3D-CT is a valuable and preferred diagnostic tool, which facilitates in providing accurate information regarding length, angulation, and anatomical relationship.

Langlais *et al.*,[10] classified elongated SP into; type I pattern, which is uninterrupted, elongated process, type II characterized by the SP apparently being joined to the stylohyoid ligament by a single pseudo-articulation giving the appearance of an articulated elongated SP, and type III consisting of interrupting segments of the mineralizedligament, sometimes creating the appearance of multiple pseudo-articulations. In this case, elongated SP on the right side was Langlais type III and left side was Langlais type I.

Conservative modality of treatment includes local infiltration of anesthetics, (NSAIDS) non steroidal anti-inflammatory drugs, and steroids in tonsillar fossae region. Surgical treatment includes styloidectomy, for which both extra-oral and intraoral approach can be used. Advantages of intraoral approach are less time consuming, simple, no scarring and disadvantages are poor visualization of surgical field, possible injury of nearby neurovascular structures, and risk of deep neck space infection.

Advantages of extra-oral approach are better visualization of surgical field and disadvantages are time consuming, neck scar, and risk of damage to facial nerve. In this case, the surgical intervention was adopted using an extra-oral approach on the left side and intraoral approach on right side without any post-operative complications.

Summary

Patients presenting with radiating cervico-facial pain detailed physical examination should be carried out and possibility of Eagle's syndrome should also be considered though it is rare. Clinicians should be well aware of this condition. In imaging, CT scan is the most preferred diagnostic tool.

Conclusion

Eagle syndrome develops due to ossification of stylohyoid ligament and analysis of clinical symptoms is the mainstay in diagnosing, as the symptoms usually overlap with other conditions like neuralgia and temporomandibular disorders. Radiological analysis by panoramic radiograph and 3DCT are the basic and most frequently employed methods for localizing and assessing the severity of this condition

Legends for figures

Fig 1:
a. Profile picture.
b. Right lateral oblique view demonstrating elongated right styloid process (Black arrow).
c. OPG demonstrating the elongated right styloid process (Black arrow).

Fig 2: a-d: 3DCT images of 45 year old female
a,d: Demonstration of bilateral elongated styloid process from inferior aspect of skull with the right side more elongated than the left (White arrow).
b. Posterior view of the skull showing elongated right styloid process(White arrow).
c. Right lateral view showing elongated right styloid process (White arrow).

Fig 3: 2DCT images from different sections.

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