



## Agony of the Eagle- A Case Report

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### Abstract

Eagles syndrome is the elongation of the styloid process causing varied symptoms namely neck pain, dysphagia, referred pain to the ear, neuralgia, etc. These symptoms in a patient mimic other known diseases and hence take time for diagnosis of this disease. But nowadays with the advancement of radiological image guiding modality, it is diagnosed much easier and earlier. The normal length of a styloid process is 25 to 30mm. In our patient, the styloid process on the right and left side was 66mm and 33mm respectively. Computed tomography (CT) scan along with 3D reconstructive imaging was done for our patient. Intraoral tonsil sparing excision of the styloid process was done in our patient. Treatment strategies generally include medical management and surgical. Medical management includes the usage of analgesics, corticosteroids, antidepressants, and anticonvulsants, whereas in surgical varied approaches are extraoral, transoral, and endoscopic assisted. The Elongated Styloid process should be kept in mind when dealing with chronic throat pain not relieved on long-term medications.

**Keywords:** Eagles Syndrome; Facial Neuralgia; Ossification of Stylohyoid Ligament; Length of Styloid Process; Styloidectomy

**Abbreviations:** CT: Computed Tomography; ES: Eagle's Syndrome; MLA: Mediolateral Angling; APA: Anteroposterior Angling.

### Introduction

Eagle's syndrome is defined as the elongation of the styloid process or calcification of the stylohyoid ligament causing pain in the neck. Patients usually present with mixed symptoms of facial neuralgia, throat pain, dysphonia, dysphagia, dystonia, throat discomfort, referred pain to the ear, and foreign body sensation in the neck. It is often diagnosed as an incidental neck finding when other causes of facial neuralgia and neck pain are excluded. Eagle's syndrome can be both unilateral (more frequent) and bilateral. The styloid process is a long, narrow, thin bony process measuring about 25mm between two highly vascular structures, the internal and external carotid arteries. Three muscles namely the stylohyoid, styloglossus, and stylopharyngeus muscle, and two ligaments

namely, the stylohyoid and the stylomandibular ligaments are attached to the styloid process [1,2]. The styloid process is in relation to the cranial nerves V, VII, IX, and X and hence elongation causes varied symptoms due to impingement on one or more than one nerve causing symptoms in the patient [3].

### Case Report

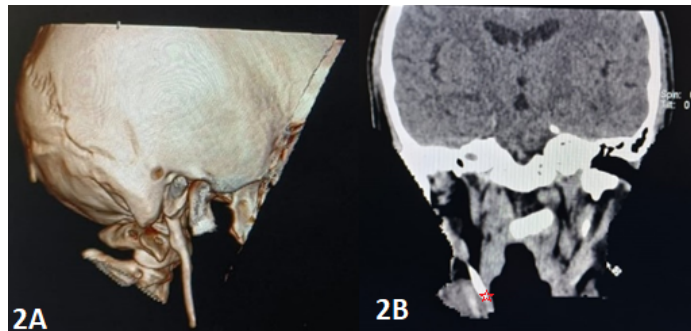
A 35year old male came to ENT OPD complaining of pain in the right side of his neck for the last 6 months. The patient developed difficulty in swallowing food and had pain in the right side of the neck. The pain was acute in onset, gradually progressive, sharp pricking in character, moderate in intensity, and radiating to the right ear. The pain increased more on swallowing food, turning his head, and facing to the right side while sleeping. The patient also complained of a foreign body-like sensation on the right side of the throat. The patient did not have any voice change or difficulty

breathing. There was no history of any previous surgeries or any history of trauma to the neck. The patient had sought multiple doctors from various fields and had taken many pain medications but those only provided symptomatic relief for some time. Intraoral visual examination was normal with grade 1 tonsillar enlargement. On palpation, there was tenderness on the right tonsillar fossa, and a sharp projection was felt along the superior pole of the anterior tonsillar pillar. A diagnosis of Right Eagle's syndrome was suspected. The patient was subjected to a Radiographic examination (Non contrast CT Neck and 3D facial reconstruction), which revealed the length of the Right and Left styloid process as 66mm and 33mm respectively, thus confirming the diagnosis of Eagle's syndrome. The patient was admitted to the ward and was prepared for a Right Styloidectomy. After proper local infiltration, an incision was given over the right anterior pillar of the tonsil, and the superior constrictor was dissected. The entire styloid process was dissected out from the inferior to the superior pole which measured about 6 cm. Keeping a stump of about 1.5 cm the remaining length was excised. Following OT, the patient was started on analgesics and broad-spectrum antibiotics. After keeping the patient under observation for 3 days the patient was discharged as

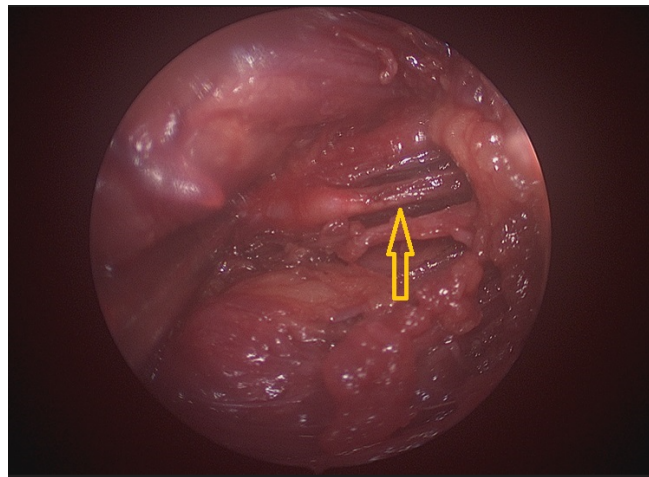
he improved symptomatically. The patient came for follow-up at 3-month and 6-month intervals and was asymptomatic, with no complaints from the operated side.



**Figure 1:** Styloid segment of 4.5 cm length post excision.



**Figure 2:** (A) Long styloid process on 3D CT (B) Elongated styloid process on the non-contrast CT.



**Figure 3:** Intraoperative endoscopic picture of styloid process.

## Discussion

Eagle's syndrome (ES) is a clinical condition in where there is abnormal ossification of the stylohyoid apparatus. The stylohyoid apparatus consists of the styloid process, the attached stylohyoid ligament, and the lesser cornu of the hyoid bone [4]. Anatomically, the styloid process passes downwards, forward, and medially after arising from the Temporal bone [4]. Embryologically, the Styloid process is derived from the Reichert's cartilage, which itself is a component of the second branchial arch [4]. Varied pressure symptoms arise when the elongated styloid process causes impingement on structures like the carotid artery, internal jugular vein, hypoglossal nerve, glossopharyngeal nerve, facial nerve, vagal nerve. Normally, the length of styloid process varies between 25mm-30 mm ; if the length exceeds 30mm, it is said to be elongated. Elongation of the styloid process can be due to varied reasons - idiopathic, congenital or acquired. Other factors responsible for symptoms and signs of Eagle's syndrome include mediolateral angling (MLA), anteroposterior angling (APA), and the bending of the SP head [5]. The symptoms of Eagle's syndrome can be due to the varying length of the styloid process and the anterior angulation of the styloid process [6].

### Symptoms may be because of: [4]

- Granulation tissue proliferation following styloid process fracture, which results in pressure on surrounding structures
- Impingement on adjacent nerves
- Pharyngeal mucosa getting irritated either due to direct compression by styloid process, or scarring following post-tonsillectomy
- Degenerative and inflammatory changes at the site of insertion leading to insertion tendonitis.
- Eagle primarily described two syndromes: [4]
- Classic styloid syndrome: As the name suggests it is characterized by pain localized in the tonsillar fossa, following tonsillectomy. Symptoms include difficulty in swallowing food, throat pain, the feeling of something struck in throat and lastly voice changes.
- The Stylo-carotid syndrome: In this condition, the stylohyoid apparatus compresses the perivascular sympathetic fibres of the internal carotid and/or external carotid artery, resulting in persistent pain irradiating in the carotid territory.

The styloid process length more than 30mm requires intervention either medically or surgically depending on the patient's symptoms. In a study conducted by Shah O, et al. [7] he found the mean length of the styloid process to be 27.8mm to 35.8mm. In a study conducted by Cullu N, et al.,

he found the mean length of the styloid process to be that of 22.9mm to 33.9mm [7]. In my case, the styloid process of my patient was 66mm and 33mm on the right and left sides, respectively.

Treatment of the Eagle's syndrome is generally either medical or surgical. In most cases, medical line of management is with NSAIDs. Other alternatives are anticonvulsants, antidepressants and local injections of pain medications [8]. Surgical management are more permanent management plans especially for patients who don't respond to medical management. There are two types of main approaches namely the intraoral and the cervical. The traditional intraoral approach is to do a tonsillectomy followed by identification of the styloid process by palpating the tonsillar fossa. Dissecting the superior constrictor through the tonsillar fossa and reaching the base of the styloid process. After freeing the styloid process of all its attachments, it is broken with a rongeur and excised. A newer intraoral approach is by sparing the tonsils; wherein the anterior tonsillar pillar is incised and similar steps are followed to excise the styloid process [9]. The difficulties faced with an intraoral approach are the poor visualization with this approach which has been made better with the advent of endoscopes. Despite that due to the constricted environment of the surgery, any complication like carotid bleed can be difficult to manage via this route.

Cervical approaches to surgery give much better exposure but have a poor cosmetic outcome. The incision is generally placed behind the angle of mandible and is extended along the sternocleidomastoid muscle. The sternocleidomastoid is then retracted and then the dissection is carried out between the posterior belly of the digastric and the parotid gland to reach the styloid process. The subperiosteal dissection of the styloid process is done followed by its excision. The main risk of this surgery is the risk of damage of the facial and the marginal mandibular nerves [10]. The final call on the surgical management of the patient is always dependent on the surgeon's feasibility and experience.

## Conclusion

Eagle's syndrome should always be kept in mind when a unilateral pain arises especially in adult women and where the pain is not responsive to varied analgesics and other medical treatment. In addition, the aggravation of the pain by swallowing, yawning, and crying, as in our patient, should help in pointing towards the right diagnosis. A multidisciplinary approach is advisable which includes an early radiological investigation, of the styloid process (MDCT Styloid process) [4]. Surgical management of Styloidectomy is divided by approach - Intraoral and Cervical approach [5].

## Consent to Participate

Informed consent was received from the patient.

## Consent for Publication

Informed consent was obtained from the patient to publish.

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