



Eagle's Syndrome Myth or Fact

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Introduction

The head and neck is a region noted for a multiplicity of ill-defined pain syndromes. Any pain in head and neck region is very disabling and constitutes for much loss of working hours. It is often very difficult to differentiate organic from functional symptoms in patient having pain in the head and neck region due to varied obscure causes. In all such cases it is essential that the primary physician evaluates every case with great attention. But when these cases do not improve with primary level health physician then they present to the Otorhinolaryngologist. Here the role of surgeon is crucial in order to provide relief to the patient. Pain in the neck, localized to one side of the throat, also radiating towards the mastoid area on the same side, can be a diagnostic challenge. The cause of chronic throat pain with

foreign body sensation which radiates towards the ear associated with swallowing may be due to elongated styloid process.

The styloid process is a thin, slender, cylindrical spicule like bony projection. It is located just in front of stylomastoid foramen, and fused to the mastoid process of temporal bone. Many nerves and vessels are adjacent to the styloid process¹. The normal styloid process length is approximately 20-30 mm². The styloid process tapers towards tip that lies in the pharyngeal wall lateral to the tonsillar fossa. Many important neurovascular structures lie near the tip of the styloid process. The internal carotid artery, internal jugular vein, and cranial nerves X, XI, and XII lies on its medial side³. Kuer et al suggested that a styloid process longer than 30 mm was considered to demonstrate styloid

process elongation⁴. This process gives attachment to 3 muscles and 2 ligaments

Muscles–

1. Stylopharyngeus.
2. Stylohyoid.
3. Styloglossus.

Ligaments -

1. Stylohyoid.
2. Stylomandibular

Stylohyoid ligament which extends from tip of styloid process to the cornu of hyoid bone and stylomandibular ligament which extends from the styloid process below origin of styloglossus muscle to the angle of lower jaw. The styloid process, stylohyoid ligament and lesser cornu of the hyoid bone are derived embryologically from the second branchial arch.

The elongated styloid process was first described in the English literature as long ago in the nineteenth century by Eagle. It was not until 1937 that Eagle focused attention on the styloid process as the cause of neck pain distinguishable from primary glossopharyngeal neuralgia and the term EAGLE'S SYNDROME was coined in his honour³. The following symptoms were suggestive for the elongated styloid process, a dull ache in the larynx, pain referred to the ear, pain behind the angle of mandible, difficulty in deglutition and sometimes a foreign body sensation in the throat. It is assumed that these signs and symptoms originate from the compression of the styloid process on the neural and vascular structures.

Pain in the throat and neck can be both challenging and at the same time has to be viewed with great care by every otolaryngologist, neurologist or dental surgeon. This is because there are varieties of similar pain syndromes in this region, many of which are having vague complaints difficult to be expressed by the patient. These patients may pass through the hands of different specialties often receiving a variety of treatments en route which may not only be

ineffective but may also cloud the clinical picture of a firm diagnosis.

Hence the present study aims at highlighting the anatomico radiological features of an anomalous styloid process and discusses its clinical implications and association with different clinical symptoms in relation to age, sex.

Aims

To investigate and evaluate for the possibility of elongated or enlarged styloid process as cause of long standing throat pain.

Materials and Method

The study was carried out in the department of otorhinolaryngology in Index Medical College Hospital & Research Centre, Indore from Jan 2015 to Aug 2016, with random sampling of patient coming to the hospital with complaints of:

1. Chronic throat pain or dull ache in neck which referred to the head, ear, cervical region or the angle of mandible.
2. Patients with complaints of difficulty in swallowing.
3. Foreign body sensations in the throat.
4. And second group was also made which was asymptomatic, and were coming to radiology department in Index Medical College Hospital & Research Centre, Indore. And underwent CT scan of head and neck region for various other indications.

All the symptomatic patients coming to ENT OPD, a detailed history was taken and through clinical examination and investigation were carried out. The tonsillar fossa was palpated for enlarged styloid process, to reproduce the symptoms. If in the tonsillar fossa on palpation tenderness was elicited patient was further sent for investigations.

After ruling out any other cause of throat pain like tonsillitis or pharyngitis etc.

Patient was sent to confirm the diagnosis of enlarged styloid by CT scan with 3D reconstruction. All the CT scans were performed

on spiral scanner 64 slice Somatom Definition AS of Siemen definition AS64 slice MDCT scanner. The length of the styloid process was measured from the base of skull, after 3D reconstruction. The real origin of the styloid process is from the lower part of the temporal bone which is hidden by the shadows of the base of the skull. In this study the role of CT scan with 3D reconstruction was to measure the exact length of the styloid process.

As, it not possible to get an exact length of the styloid process with X rays or by OPG.

After through history and clinical examination of the patient, along with palpation of styloid process in the tonsillar fossa. Patient was sent for CT scan of the styloid process with 3D reconstruction. In the CT measuring and recording the length of styloid process, when the styloid process was $\geq 30\text{mm}$ patient was categorized as Elongated Styloid Process (ESP).

Criteria for Diagnosis of Elongated Styloid Process Syndrome

- 1) The characteristic dull nagging pain in throat, pain behind the angle of mandible, pain on deglutition, pain referred to ear, hyoid region and sometimes to head.
- 2) The palpatory examination of the tonsillar fossa eliciting similar symptoms, though stronger pharyngeal pain.
- 3) The radiological demonstration of ESP $\geq 30\text{mm}$.
- 4) The physician's alertness to this diagnostic possibility is the main milestone on the way to the correct diagnosis.

Management

The treatment of elongated styloid process syndrome consists of surgery in carefully selected patient. The only satisfactory and effective treatment to eliminate symptoms caused by an elongated or misdirected styloid process is its surgical shortening advocated by Eagle through the tonsillar fossa approach.

The operation is best performed under general anesthesia with an endotracheal tube passing through the nostril or orally but it can also be performed under local anesthesia especially in intraoral approach.

After premedication, patient arrives in the operation theatre drowsy or asleep. Then patient is kept in rose position on the operation table.

Draping is done with thorough preparation for surgical procedure. Then patient's mouth is opened and Boyle's Dawis mouth gag is applied. Then 2% xylocaine with 2 lac units of adrenaline solution is taken and infiltrated in upper, middle and lower part in the anterior pillar and tonsillar tissue and same on the posterior pillar.

Observation & Results

The prospective study was conducted at Index Medical College Hospital & Research Centre, Indore (M.P.) from JAN 2015 to AUG 2016. In this study patients above 21 years. of age were included. First group consisted of symptomatic patients who attended ENT OPD with the history of:

- 1) Dull nagging pain in the throat, pain radiating to the ear and hyoid region, pain in cervical region, pain behind the angle of mandible, difficulty in deglutition for more than 3 months.
- 2) Patient presenting with F.B. sensations in the throat.
- 3) Palpation was done in each case in the tonsillar fossa.
- 4) The diagnosis was based upon production of symptoms on digital palpation of the styloid process. Details of the styloid complex were studied by CT scan with 3D reconstruction. The subjects showing the length of $\geq 30\text{mm}$ were categorized as ESP.

Second group (control group) consisted of all asymptomatic patients, who underwent CT scan of head or neck region for various other indications in the Department Of Radiology & styloid complex studied in detail. Observation of 700

cases for styloid complex was made in symptomatic group of 350 patients and asymptomatic group of 350 patients.

Table for age distribution of symptomatic patients

Age Group in years.	No. of patients.	percentage of patients
21 – 30 years	104	29.71
31 – 40 years.	102	29.15
41 – 50 years.	81	23.14
> 50 years.	63	18

Table shows the average age of symptomatic group was 38.9 years. Most of the patients were observed to have age between 30 to 50 years And least patients were observed in age >50years Were as in control group the average age was 42.3 yrs. The age of presentation was observed to equal in all the age groups except 41-50yrs age. Least patients were in between age group of 41 to 50 yrs

Table for sex wise distribution of symptomatic patients

sex	Number of patients	Percentage of patients
Male	193	55.15
female	157	44.85
Total	350	100

Table shows sex-wise distribution of patients, 193 male patients. i.e. 55.15% and 157 female patients i.e. 44.5% were in symptomatic cases.

Were as In control group sex-wise distribution was 175 male patients. i.e. 50% and 175 female patients i.e. 50%.

Symptoms-Wise Distribution of Cases

SYMPTOMS	LEFT	RIGHT	None
THROAT PAIN	350	326	-
F.B. SENSATIONS	226	213	-
PAIN BEHIND THE ANGLE OF MANDIBLE	113	126	65
OTALGIA	251	235	20
ODYNOPHAGIA	321		29
CERVICAL PAIN	223		127

All patient has complain of throat pain. 226 patients had F.B. sensations on left side and 213 patients on right side. While 42 patients had no F.B. sensations. 113 patients had pain behind the angle of mandible on left; 126 on right side and 65 had no pain behind the angle of mandible. Otalgia

was seen in 251 patients on left side and 235 on right side and absent in 20 patients. odynophagia was seen in 321 patients and in 29 patients there was no odynophagia. 223 patients presented with cervical pain and 123 patients there was no cervical pain.

Length of styloid complex

Length of styloid process	No. Of patients	
	Left side	Right side
<2 cms	61	55
2 cms -2.4 cms	45	60
2.5 cms -2.9 cms	141	140
3 cms -3.4 cms	58	83
3.5 cms -4 cms	34	12
>4cms	11	0

Most of the patients were observed to have length of styloid process in symptomatic cases between 2.5 cms to 2.9 cms. Least no. of patients were observed to have length of left styloid process in symptomatic cases of >4 cms. The average length of styloid process complex on left and right side in symptomatic cases was observed to be 2.95 cms and 2.99 cms respectively

Where as in control group The average length of styloid process complex on left and right side was observed to be 2.15 cms and 2.018 cms respectively

Inference

1. The styloid process on both sides was significantly increasing progressively with the age.with mean age of 38.9 years.
2. Average length of styloid process complex in symptomatic group came to be 2.95cms & 2.99cms.
3. Symptomatology was more common between 30 to 50 yrs of age.
4. All symptomatic cases had the length of styloid process in range of 2.5 cms to 3 cms (except 2 cases which had more than 3 cm).
5. Symptomatology was more common in males.symptomatic group were 55% male & 45% female .

The mean length of left and right styloid process compared in both the groups, came to be

significantly more (student t-test) in the symptomatic group.

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