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ORIGINAL RESEARCH

Eagles Syndrome: A Diagnostic and Surgical Predicament

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ABSTRACT
Eagle's syndrome is a pain syndrome which occurs due to elongated and misdirected styloid process.All patients above 18 years of age and below 65 year Patients with history of chronic throat pain. Patients with palpable styloid process intraorally and patients with Elongated styloid process > 3 cm in length on CT were included in our study.Results showed that the length of the styloid process correlates with the clinical signs and symptoms. Tonsillo-styloidectomy is the treatment of choice in majority of cases of Eagle's syndrome. In our Study the elongated and misdirected styloidprocess correlated with the symptoms.

Keywords: Eagles Syndrome, stylohyoid process, hyoid bone.

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INTRODUCTION

Eagle's syndrome is a pain syndrome which occurs due to elongated and misdirected styloid process. Eagle's Syndrome is a rare clinical condition, which often presents with recurrent pain in the oropharynx and face, foreign body sensation in the throat, dysphagia and referred otalgia due to an elongated styloid process or calcified stylohyoidligament[1]. The true incidence is about 0.16%, with a female to male predominance of 3:16. Bilateral involvement is quite common but does not always involve bilateral symptoms[2]. Eagle defined the length of a normal styloid process at 2.5-3.0 cm[1,3,4].

The styloid process is a slender outgrowth at the base of the temporal bone, immediately posterior to the mastoid apex[3].It arises from the inferior surface of the temporal bone at the junction of its petrous and tympanic portions[3-4]. It lies caudally, medially, and anteriorly towards the maxillo-vertebro-pharyngeal recess (which contains carotid arteries, internal jugular vein, facial nerve, glossopharyngeal nerve, vagal nerve, and hypoglossal nerve)[1,3]. With the stylohyoid ligament and the small horn of the hyoid bone, the styloid process forms the stylohyoid apparatus, which arises embryonically from the Reichert cartilage of the second branchialarch[1,3].

The styloid process may vary from 5 to 50 mm in length and the stylohyoid ligament may ossify from its origin at the styloid process to its attachment at the hyoid bone[5].

Moffat [6]described the normal length of styloid process as 1.52-4.77 cm, Kaufman [7] described it as less than 3 cm, Lindeman [8]described it as 2-3 cm, Correl[9] &Langlais [10]and Montalbetti[11] described it as less than 2.5 cm, while Monsour and Young[12]described it as less than 4 cm and Balcioglu[13] defined it as 4cm+/- 4.72 mm.

When the patient presents to the otolaryngologist with symptoms of pain in the throat not consistent with history of tonsillitis/ foreign body sensation/ referred otalgia or headache, a differential diagnosis of Eagle's syndrome should be considered[2,4] . Diagnosis is usually made by palpating the tonsillar fossa for Tenderness which could be due to elongated styloid process[14-16] .The diagnosis is confirmed by soft tissue lateral radiograph of the neck, skull Towne's view or a computed tomography (CT) scan[14]. Approximately 4% of the general population have an elongated styloid process and a calcified stylohyoid

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ligament, but only a small percent are symptomatic[14-15].

METHOD

STUDY TYPE: ORIGINAL RESEARCH ARTICLE

This study was carried out in OutpatientDepartment of ENT in Maharishi Markendeshwar Institute of Medical Sciences and Research MullanaAmbala Haryana India for a period of 2 years i.e from June 2022- May 2024.

Total 30 cases of elongated styloid process with symptoms were studied.

SELECTION CRITERIA: The characteristic symptoms were chronic throat pain and foreign body sensation in throat. Examination of the oropharynx revealed normal looking tonsils in all the cases. As the pain did not coincide with the clinical symptoms of tonsillitis, palpation of the upper part of both the tonsillar fossa were performed using gloved fingers. Tenderness was seen while palpating the upper part of tonsillar fossa along with A sharp prick or a blunt bony elevation was felt in most of the cases on palpation.

The patient's past medical history was non-contributory and there were no extraoral findings.

INCLUSION CRITERIA: All patients above 18 years of age and below 65 year Patients with history of chronic throat pain. Patients with palpable styloid process intraorally and patients with Elongated styloid process > 3 cm in length on CT were included in our study.

EXCLUSION CRITERIA: Patients with features of LPR & GERD. All the other possible causes of pain that is, odontogenic, oral lesion, dental, neuralgic and muscular, and temporomandibular diseases were ruled out.

PROCEDURE: The tenderness on palpation of tonsillar fossa on affected side in the cases revealed elongated styloid processes as compared to contralateral side and therefore the diagnosis of Elongated styloid process was made. 3D CT face was done for radiological correlation. All Patients who had styloid process of size more than 3 cm underwent Tonsillo -styloidectomy via transoral route for affected sites under General anaesthesia. In the transoral approach, the styloid process can be palpated in the superior lateral pole of the tonsillar fossa. Tonsillectomy was done prior to removal of styloid and then styloid process was identified after palpation. Once identified, Superior constrictor muscle is dissected to expose the styloidprocess . The overlying mucosa is incised, the styloid ligament is dissected free from the calcified styloid process, and an incision is made through the periosteum of the styloid process, which is then excised as close to its base as possible. Haemostasis was secured and parapharyngeal space was closed with vicryl suture. Post operative follow up was done upto 8 weeks.

ETHICAL APPROVAL: Approved by the institute

STATISTICAL ANALYSIS: Data was analysed using SPSS 25.0 software.

OBSERVATIONS

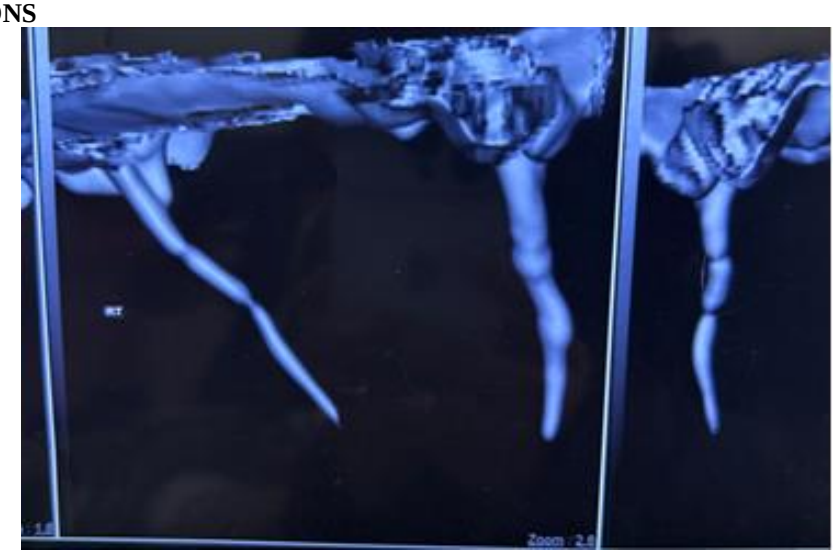

Figure1: B/L Elongated Styloid Process With Rat Angulation

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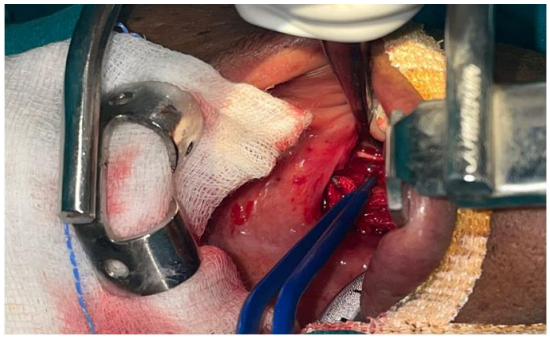

Figure 2: Intraop Pic Exposed Styloid Process After Tonsillectomy

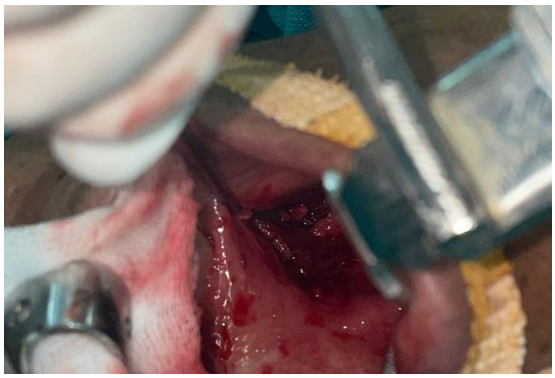

Figure 3: Clear Tonsillar Fossa After TonsilloStyloidectomy

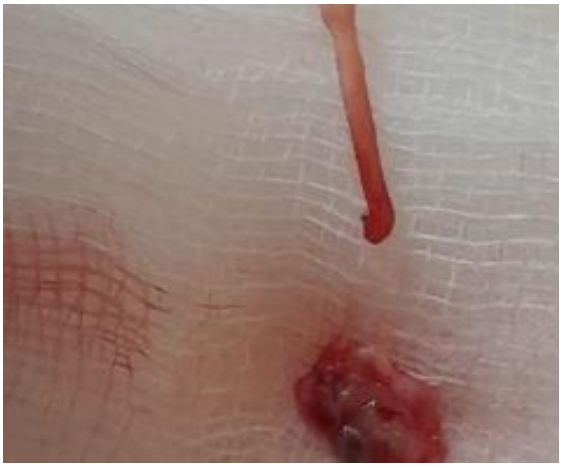

Figure 4: Excised Specimen Of U/L Tonsil WithStyloid Process Rside

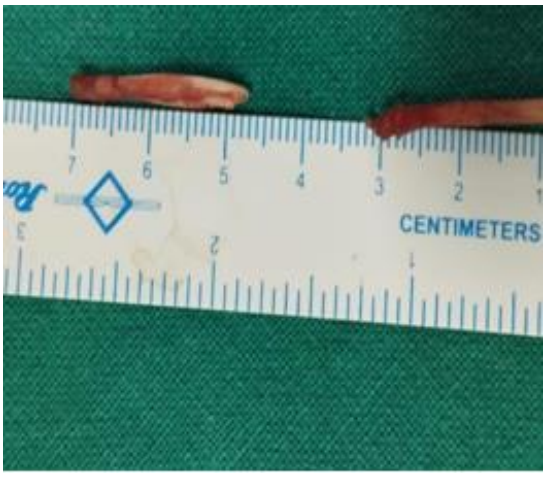

Figure 5: Excised Styloid Process Specimen B/L

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Table: I - Age Distribution

Age in years	No of patients
20-30	9
31-40	13
41-50	8

Table I: In our study maximum no. of patients were found in age group of 31-40 years least number of patients age group of 41-50.

Table: II- Gender Distribution

Male	Female
44%	56%

Table II: In Our Study female Preponderance Was Highest I.E 56%.

Table: III – Geographical Distribution

Rural	Urban
79%	21%

Table III: In Our Study Majority Of The Patient Were Of Rural Background I.E 79%.

Table: IV - Presenting Complaints

Presenting Complaints	No. Of Patients
Pain R Side Neck	10
Pain L Side Neck	18
Foreign Body Sensation In Throat With Pain In Throat	13
Dysphagia	11

Table IV: In Our Study Most Common Presenting Complaint Was Pain L Side Of Throat 60% Followed By Foreign Body Sensation In Throat And Least Presenting Complaint Was Of Dysphagia 36%.

Table: V - Intraoral Palpation

Intraoral palpation	No. Of patients
Elongated process on right side	10
Elongated process on left side	18
Elongated process bilaterally	2

Table V: In Our Study 60% Patients Experienced Pain On L Side , 33 % Patients On R Side And Only 6% Patients Bilaterally.

Table: VI- Computed Tomography Findings

Length Of Styloid Process	No. Of Patients
3.0 CM - 3.5 CM	15
3.5 CM - 4.0 CM	12
4.0 CM - 4.5 CM	3
OSSIFICATION OF LIGAMENTS	12

Table VI: In our Study 50% of the patients had styloid of length between 3-3.5cm & only 10% have between 4-4.5cm.

Table: VII - Residual Complaints And Complications

Resolution Of Symptoms	Partial	Complete
	7	23
Complications	None	

Table VII: In Our Study 76% Of The Patients Had Complete Resolution Of Symptoms .

DISCUSSION

Eagle's syndrome is an aggregate of symptoms that includes recurrent throat pain, foreign body sensation, dysphagia and/or facial pain as a direct result of an elongated styloid process or calcified stylohyoidligament[16]. Main symptoms of the syndrome include nonspecific neck pain, foreign body sensation in the pharynx, odynophagia, otalgia, pain in the temporomandibular joint and trismus[3], change in voice, and sensation of hypersalivation [17]. Painful palpation of the tonsillar fossa, together with suggestive clinical and radiological signs, corroborates the diagnosis of Eagle's syndrome. In addition, pain relief achieved through infiltration of

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local anesthetics into the tonsillar fossa is suggestive of the disease [4,18].

Steinmann [19] proposed four theories for the causation of variance in ossification and elongation of the styloid process:

- The first theory is the theory of reactive hyperplasia which suggests that the styloid process reacts and proliferates causing elongation following pharyngeal trauma.
- The second theory is the theory of reactive metaplasia which suggests that the stylohyoid ligament undergoes metaplasia and partial ossification which in turn results in abnormal ossification.
- The theory of anatomic variance is the third theory which proposes that the ossification of the styloidprocess, and the stylohyoid ligament is a normal occurrence depicting an anatomical variation.

The fourth theory suggests that retained embryologic tissue from Reichert's cartilage is the causative factor for elongation [20].

Though all the four theories give feasible explanations for the styloid process elongation, a universal agreement has not been instituted [21-22]. Styloid elongation, as described by Correll, is classified into 3 types [19]:

- Type I—represents uninterrupted elongated styloid process,
- Type II—represents a styloid process joined to the stylohyoid ligament by a single pseudo-articulation.
- Type III—comprises of interrupted segments of the mineralized ligament, which has an appearance of multiple pseudo-articulations within the ligament.

Additionally Langlai[19] described 4 types of calcifications:

- Type 1 is calcified outline.
- Type 2 is partially calcified.
- Type 3 is nodular complex.
- Type 4 is complete calcification.

Radiological examination[23] can confirm the syndrome. Radiography can show the increased length of the styloid process. Imaging should be ordered before surgery. CT films of the skull may also be ordered, and they have been described as an adjunct to plain films [24]. Currently, computed tomography is considered to be the best examination for defining the length and angulation of the styloid process and also enables an evaluation of the anatomical relationships between the stylohyoid complex and adjacent structures [25,26,27].

At present, Eagle's syndrome can be treated either pharmacologically or surgically. Conservative management includes Nonsteroidal Anti-Inflammatory Drugs (NSAIDS), drugs used to treat neuralgic pain like Gabapentin and tianeptine. In addition, 1 ml of triamcinolone 10 mg combined with 0.3% mepivacaine 3 mg injected once in the tosillar fossa can also be tried [28]. All of the above treatment provides temporary relief; hence, surgical management involving resection of elongated styloid process by intraoral or extraoral approach is the treatment of choice for Eagle's syndrome. Surgical resection of styloid process is the most acceptable treatment option for Eagle's syndrome. The surgical approaches include an external (transcervical) and an internal (intraoral). Severity of symptoms, degree of elongation and location of styloid process are considered as important factor in establishing the most suitable technique.

CONCLUSION

Eagle's syndrome associated with elongated styloid process is a rare clinical entity. Clinical palpation of tonsillar fossa was complemented with a plain radiography of skull base Towne's view, lateral view of the skull base and CT scan to make a diagnosis. The length of the styloid process correlates with the clinical signs and symptoms. Tonsillo-styloidectomy is the treatment of choice in majority of cases of Eagle's syndrome . In our Study the elongated and misdirected styloidprocess correlated with the symptoms.

LIMITATIONS: However more studies with larger sample size are required for better authentication.

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