Introduction

The styloid process is a sharp needle-like bony projection from the lower part of the temporal bone, anteromedial to stylomastoid foramen. Its lengths vary 2 to 3 cm and is composed of two segments, a proximal component and a distal component. The proximal portion which is the base of the process is contained within the vaginal process of the tympanic portion of the temporal bone. The distal component consists of the shaft and is the site of origin for three muscles, the stylohyoid, stylopharyngeus, and styloglossus. The styloid process apex is also the origin for two ligaments, the stylohyoid ligament, which attaches to the lesser cornu of the hyoid, and the stylomandibular ligament which attaches to the ramus of the mandible muscles. Significant vessels and nerves surround the styloid process. The internal jugular vein, internal carotid artery, and glossopharyngeal nerve (CN IX), vagus nerve (CN X) and accessory nerve (CN XI) lie medial to the styloid process. The occipital artery and hypoglossal nerve (CN XII) run along its lateral side. In adults, the normal length of styloid process can vary between 20 and 25 millimeters. Styloid processes longer than 30 mm are called Elongated styloid processes (ESP). Elongated styloid process develop a constellation of symptoms known as Eagles syndrome. The symptomatology of Eagle syndrome occurs secondary to irritation or compression of surrounding structures from an abnormal long styloid process. The structure shows variations in length, angulation, and other morphological features between individuals. Incidence of elongated styloid process is around 4-7% of which only 4% are symptomatic. The symptoms are typically throat pain, ear pain, foreign body sensation in throat, dysphagia and orofacial pain radiating to the ear or along the mandible. Eagle syndrome was the first described cases in 1937 named after Watt W. Eagle an otolaryngologist at Duke University, who proposed that surgical trauma (tonsillectomy) or local chronic irritation causes osteitis, periostitis, or tendinitis of the styloid process and its ligaments which resulted in hypersensitivity lived in the area giving rise to pain.
reactive, ossifying hyperplasia. A retrospective study by Sekerci in 2015 indicated that a relationship exists between the presence of an arcuate foramen and an elongated styloid process.

Material and Methods

A retrospective study was conducted between January 2016 to December 2020 in patients with feature of eagle's syndrome who regularly attended ENT Department of Santha hospital, Miryalguda. Selective sampling method was utilized to recruit 20 subjects who underwent styloidectomy by intraoral approach and fulfilling the inclusion and exclusion criteria.

Inclusion criteria

The subjects in the age group of 30-65 years, styloid process length of 30-45 mm and who have undergone styloidectomy by intraoral approach were included in the study. Subjects having symptoms of migraine, cluster headache, trigeminal neuralgia, temporal arteritis, cervical arthritis, impacted third molars, stylocarotid syndrome, TM joint arthritis hyoid bursitis were excluded.

Exclusion criteria

A detailed note history of all the patients was taken. All the subjects were examined clinically radiological and the diagnosis was confirmed by digital palpation of tonsillar fossa. In addition to otolaryngological examination patients were subjected to dental examination. All cases lateral skull X ray was taken two subjects who can afford 3D CT facial bones. Spiral-CT with subsequent 3-D reconstruction was taken, all cases operated under general anesthesia (GA). (Figure 1). All cases are subjected to cardiology checkup as most patients were hypertensives.

Technique of removal of styloid process:

All cases underwent coablation tonsillectomy and were followed by styloidectomy. The surgical procedures were conducted under general anesthesia with endotracheal intubated, Rose position with the neck was hyperextended and Boyle's Davis mouth gag was inserted for better view of surgical field. Mouth gag was suspended bipod stand. Initially using co ablation wand tonsillectomy done homeostasis secured, then tonsillar fossa palpated for bony protrusion of the styloid process. Once the styloid process was identified, the tip of the styloid process was incised with coablation wand. With the help tonsil negus artery forceps periosteum over the styloid process was stripped off proximally like degloving. During this degloving utmost care is taken not to disrupt, the muscles and ligaments in continuity with the periosteum. When the naked styloid process was identified, the process was then grasped proximal to the desired point of resection bone nibbler was used to resect the bone and smoothen the resected edge. The wound was closed with 3.0 plain catgut sutures. All patients were taken under medical antibiotic and analgesic therapy for 1 week postoperatively.

Results

We have included 20 patients in the study. The mean age range was 46.6 ± 8.4 years with a range of 31 years to 63 years. Female: male ratio 4:1. 13 (65%) cases left side lesion seen 5 (25%) cases right side 2 (10%) cases bilateral elongated seen. The most common presenting symptom was hemicranias pain on swallowing 16 (80%), Foreign body sensation in throat 12 (60%), ear pain 14 (70%), neck pain 35 (40%) and Facial pain 8 (40%), the average duration of symptoms before surgery was 6 months. 3 (15%) patients had prior history of tonsillectomy. 11 (55%) patients pre op-
The length of the styloid process in our series ranged from 3.5 to 5.5 cm, average size of ESP specimen 4.4 cm. In our study, 92% of subjects were symptom free by third week. All patients were kept on gabapentine + nortryptiline post operatively for 2 months patients were followed for period of 18 months No perioperative complications were encountered. 17(85%) patients satisfied with treatment

Discussion

The cause of onset of pain in patients previously free of symptoms is unknown, but several theories have been proposed that include: (1) Compression of the neural elements (the glossopharyngal nerve, lower branch of the trigeminal nerve, or the chord tympani) by the elongated styloid process. (2) Fracture of the ossified stylohyoid ligament, followed by proliferation of granulation tissue that causes pressure on surrounding structures and results in pain. (3) Impingement on the carotid vessels by the styloid process, producing irritation of the sympathetic nerves in the arterial sheath. (4) Degenerative and inflammatory changes in the tendinous portion of the stylohyoid insertion, a condition called insertion tendinosis. (5) Irritation of the pharyngeal mucosa by direct compression by the styloid process. (6) Stretching and fibrosis involving the fifth, seventh, ninth, and tenth cranial nerves in the post-tonsillectomy period. (Ceylon et al., 2008)

Most general clinicians have no experience in this diagnosis and ultimately attribute the symptoms to other causes misdiagnosis hinders treatment success. The diagnosis of ES must be based on a good medical history and physical examination. A styloid process of normal length is usually not palpable. It is possible to feel elongated styloid process by careful intraoral palpation, placing the index finger in the tonsillar fossa and applying gentle pressure (Montalbetti et al., 1995). If pain is reproduced by palpation and pain referred to the ear, face, or head, the diagnosis of an elongated styloid process is very likely. Sometimes Injection of local anaesthetic into tonsillar fossa relieves pain and can be used as an alternative diagnostic tool.

Differential diagnosis for elongated styloid process includes glossopharyngeal and trigeminal neuralgia, temporal arthritis, migraine, cluster headache, cervical arthritis and impacted third molars. The commonest simplest easily available cost effective investigation tool for diagnosis of ESP Plain lateral skull X ray. By current conventions length over 3 cm is accepted as abnormal. various views that are taken into consideration are include, Lateral view, Towne radiograph, OPG, lateral-oblique mandible. Lateral views are the best to show the length of the styloid process, but antero-posterior view, Orthopantogram are needed to determine whether there is bilateral involvement and the presence of lateral deviation (Figure 2). Several imaging techniques have been employed in past, but CT is the most accurate. CT scans have been used in difficult cases to supplement diagnosis. The Spiral-CT with subsequent 3-D reconstruction made it possible to visualize the exact spatial orientation of the styloid processes and is the method of choice for exact determination of the localization.

The elongated styloid process syndrome can be treated conservatively or surgically. Various Conservative treatments modalities that have included are analgesics, antidepressant medications, anticonvulsants, Trans oropharyngeal cocktail injection of steroids and lidocaine. The most satisfactory and effective treatment is surgical shortening of the styloid process through either an intraoral or external approach. In our study all cases done by intraoral route it has few advantages over external route that the procedure can also be done under local anesthesia, there is no blind dissection of neck for tip of process, elasticity of the tonsillar bed offers haemostasis, healing is faster, the chances of neck space infection is low, shorter operative time and postoperative and reduced pain, faster recover. The main disadvantage of the trans-oral styleoidectomy is poor visibility leading to risks of iatrogenic injury to the neurovascular structure and related complication. In our study we have observed that Gabapentin a structural analogue of the inhibitory neurotransmitter gamma-aminobutyric acid (GABA) and which has action on voltage-gated calcium channels has shown promising effect on post operative neuropathic pain control when used for few months. In our study we have observed that 13 had had high BP what we feel is that HTN is simply a coexisting condition in patients with ESP. This coexisting should be taken with caution as this is a retrospective study and accurate clinical assessment of hypertension, are needed to conclusively clarify the possible relationship between hypertension and ESP.
Conclusion

Eagle’s syndrome is most frequently a diagnosis of exclusion. Lack of proper diagnosis often delays proper management and exposes patients to long-term struggle with pain and cancer phobia that cause great deal of emotional distress. Intraoral Styloidectomy approach is a simple minimally invasive approach provides a shorter operative time and faster recovery, fewer complication, with satisfactory results.

End Note

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References