Chapter 25 – Transoral Removal of Elongated Styloid Process

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Eagle, in 1937, reported two cases in which he observed that elongation of the styloid process appeared to be the cause of pharyngeal and cervical pain.[1] Over the years, little has been written about this syndrome, and in fact, there is some controversy whether this syndrome exists at all. Eagle's syndrome is characterized as a dull, aching pain localized to either or both sides of the throat with referred otalgia. Some pain may occur on swallowing or protrusion of the tongue or on rotating the head, and some patients complain of a foreign body sensation in their throat. Eagle's syndrome occurs more frequently in women than in men and is usually found in patients older than 30 years.[2] Palpation of the tonsillar fossa will reveal a hard mass[3] and reproduce the patient's symptoms.

The stylopharyngeus, stylohyoid, and styloglossus muscles all take their origin from the styloid process of the temporal bone. Gruber[4] measured the styloid process in 2000 skulls and found that most styloid processes measured from 3.0 to 5.0 cm. Eagle[5] stated that the normal styloid process is approximately 2.75 cm and any styloid process beyond that length may be considered elongated. Elongation of the styloid process with or without calcification of the stylohyoid ligament has been reported to occur frequently, but there are few cases in which they are symptomatic. The pathogenesis of an elongated styloid process is unclear. The exact cause of the pain is unknown, although several mechanisms have been suggested. The mechanism most easily understood is compression of the glossopharyngeal nerve as it passes the elongated styloid process, and the condition may be classified as an entrapment syndrome.[6]

The differential diagnosis of this condition includes cranial nerve neuralgias (e.g., trigeminal, glossopharyngeal, sphenopalatine, superior laryngeal, and primary geniculate neuralgias[2]), temporomandibular joint disease, chronic pharyngotonsillitis, unerupted or impacted molar teeth, and tumors in the oropharynx. Unlu and colleagues[7] assessed elongation of the styloid apparatus (styloid process and ligament) in degenerative or inflammatory diseases such as ankylosing spondylitis, psoriatic arthropathy, and cervical spondyloarthrosis, in which cervical spine involvement can be seen. The authors concluded that an elongated styloid process might be another manifestation of enthesopathy in the cervical spine.

PATIENT SELECTION

Many patients with Eagle's syndrome are evaluated by an otolaryngologist because of the sensation of a nagging sore throat, usually unilateral. Most have been treated with multiple courses of antibiotics, and some have been dismissed as having a functional disorder. Eagle's syndrome is characterized by a history of dull, nagging pain in an area of the throat that becomes worse during deglutition. Findings on inspection are normal, but palpation of the tonsillar fossa reveals a hard mass in the area of the tonsillar fossa and reproduces the patient's symptoms.

The differential diagnosis includes a primary tumor of the tonsil, a tumor of the parapharyngeal space, or cervical osteoarthritis. A granular cell tumor manifested as Eagle's syndrome was reported recently.[8] Nakamaru and associates studied a series of patients suspected of having an elongated styloid process with three-dimensional computed tomography (CT) reconstruction.[9] They concluded that three-dimensional CT scanning is useful for diagnosis, explanation to patients, and selection of treatment in some patients with an elongated styloid process.

An elongated styloid process with or without calcification of the stylohyoid ligament can be seen on plain posteroanterior views of the head and neck (Fig. 25-1). It is often identified on Panorex films in patients being evaluated for temporomandibular joint syndrome. A high index of suspicion on the part of the physician in evaluating these patients is probably the most important step for proper diagnosis and management.

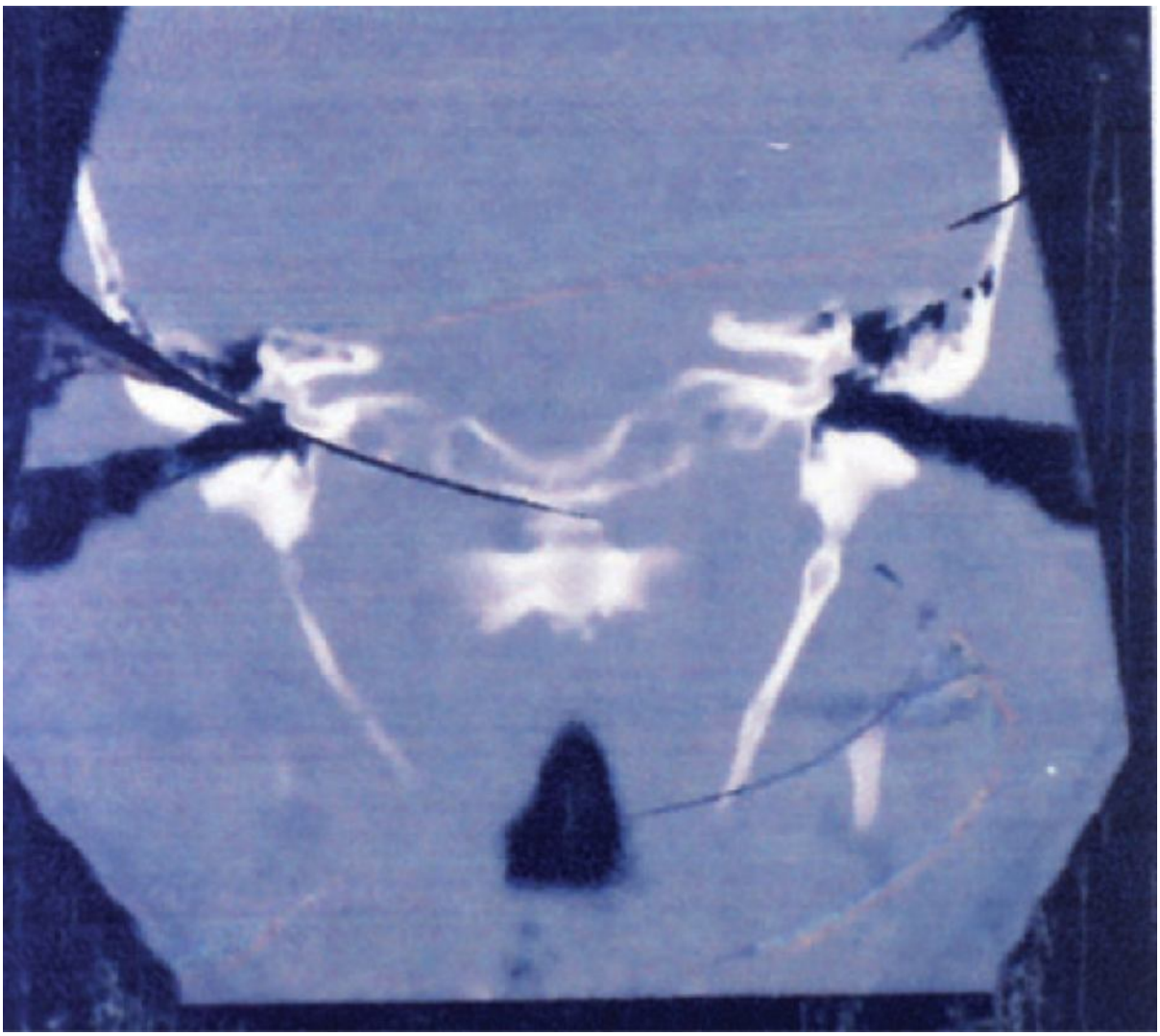

Figure 25-1 Radiograph demonstrating an elongated styloid process.

PREOPERATIVE PLANNING

Panorex radiographs or a CT scan of the head and neck provides valuable confirmatory information and a detailed map of the anatomy of the anatomic site and the relationship of the styloid process to the internal carotid artery. Infiltration of lidocaine in an attempt to abolish the symptoms is a simple test that when confirmatory, will provide reassurance to the patient and surgeon alike.[10]

SURGICAL TECHNIQUE

With the patient in the Rose position under general anesthesia, a transoral approach with a self-retaining tonsil retractor and a ring blade is carried out to be certain that the endotracheal tube is out of the operative field. Nasotracheal intubation through the contralateral nasal fossa is an excellent alternative to keep the tube out of the surgical field.

If the patient has not had a tonsillectomy, one should be performed (see Chapter 23). Many of these patients have already had a tonsillectomy, in which case an incision is made through the mucosa of the tonsillar fossa down onto the constrictor muscles. Hurd retractors are placed through the mucosal incision, and the soft tissues are pushed laterally and posteriorly to tent the tissues over the styloid process (Fig. 25-2). The constrictor muscle is then incised. Once the styloid process is identified (Fig. 25-3), the tendinous attachments are also incised and the styloid process is skeletonized with a sharp elevator or a ring curette. Care must of course be taken to retract the other local tissues to prevent injury to the underlying carotid artery. A Kerrison rongeur is then inserted and the styloid process is removed as far superior as possible (Fig. 25-4).

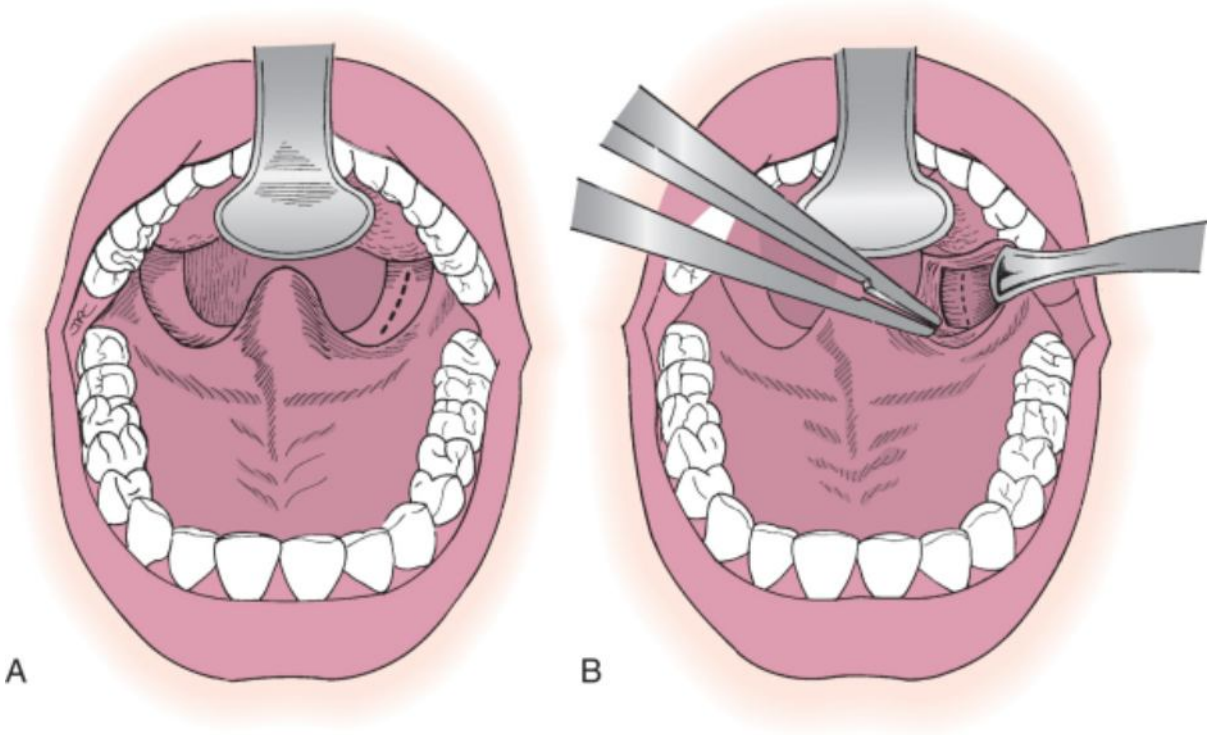

Figure 25-2 **A** and **B**, Hurd retractors tenting the constrictor muscles over the styloid process and the incision carried down onto the styloid process under direct vision.

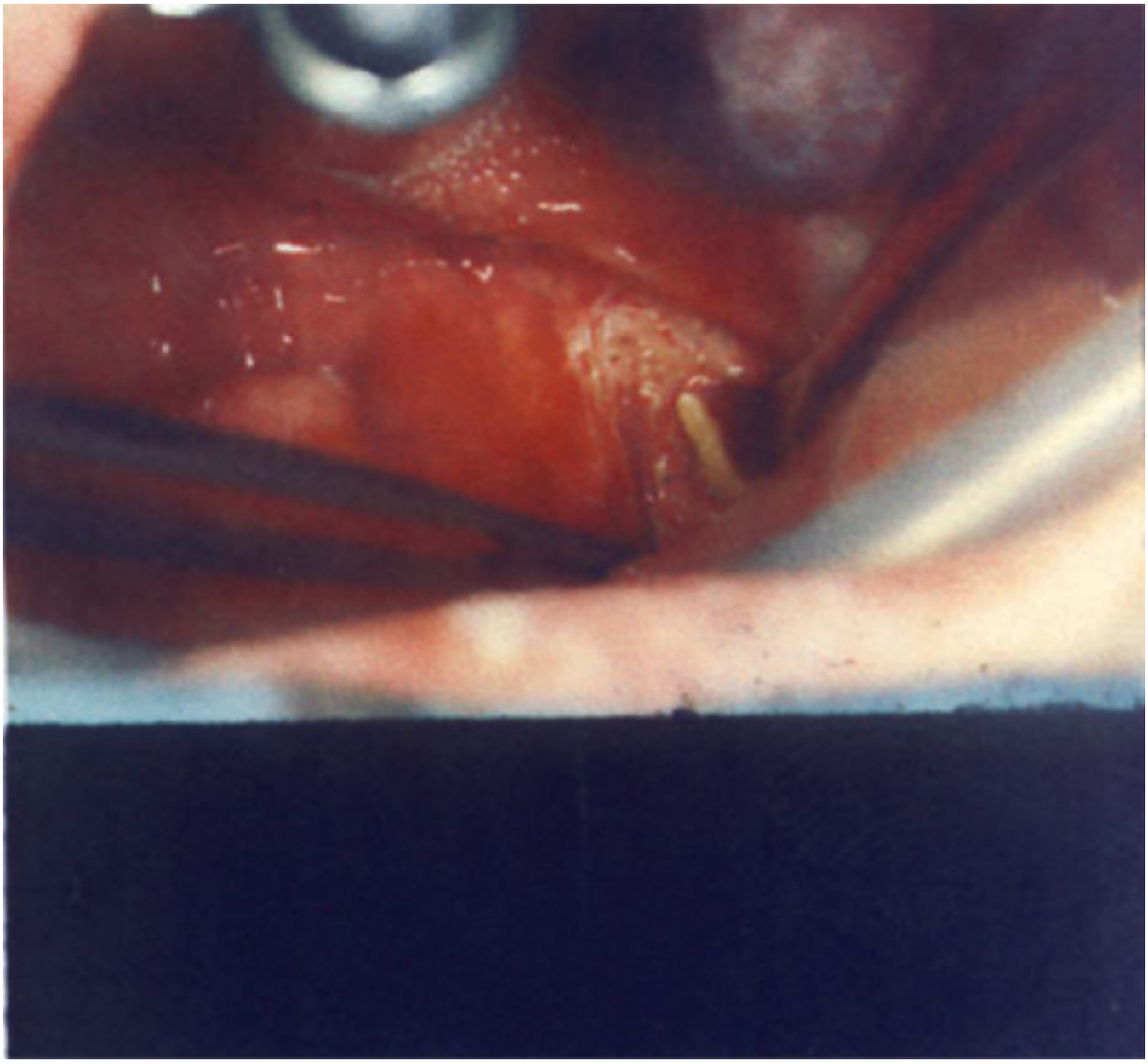

Figure 25-3 The styloid process exposed.

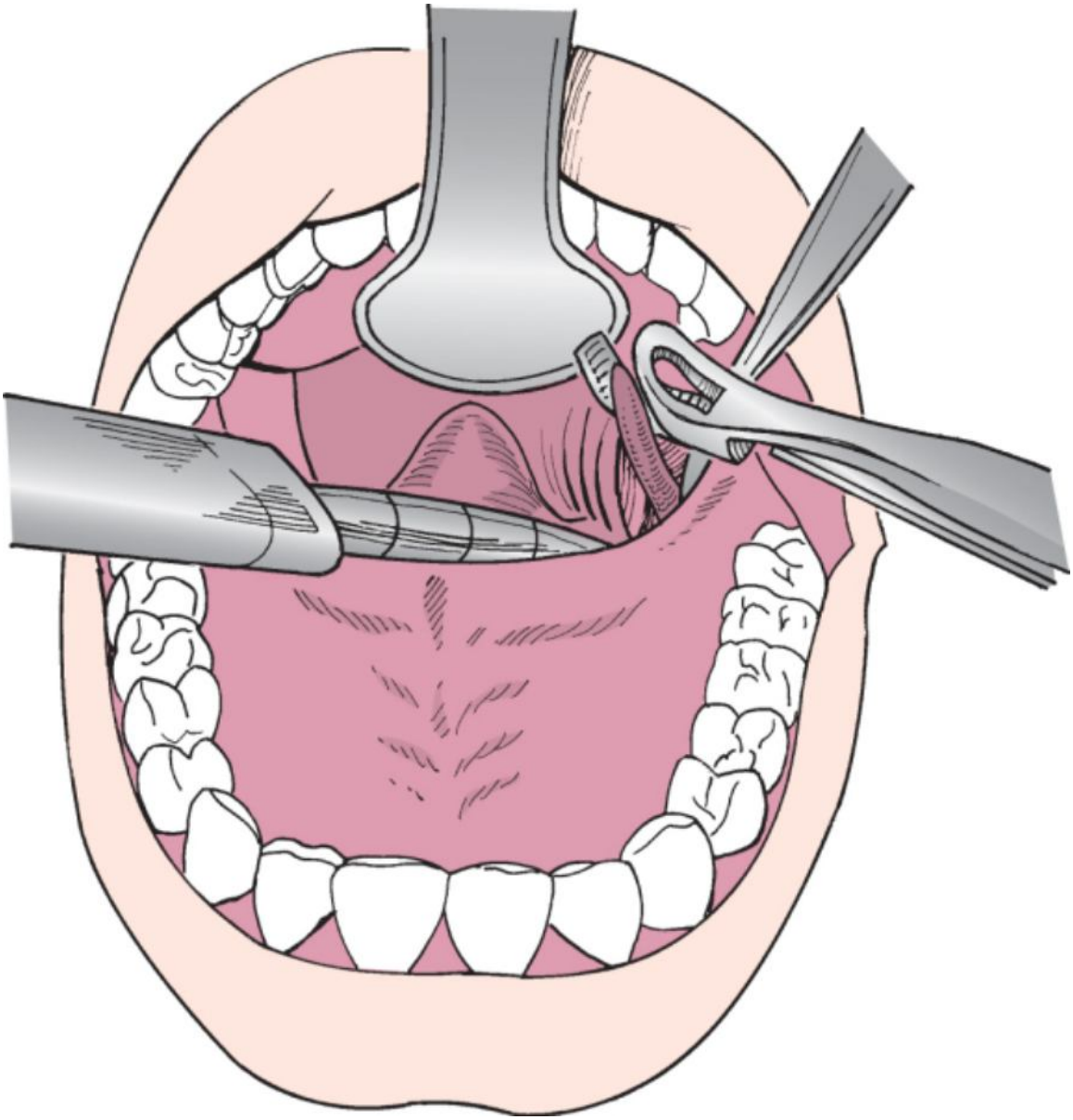

Figure 25-4 The styloid process removed piecemeal with rongeurs.

Hemostasis is obtained with electrocautery, and the wound is irrigated. Usually no blood is lost with this procedure. The constrictor muscles are closed with interrupted chromic catgut sutures, as is the overlying mucosa, and no drains are required. Perioperative antibiotics are administered.

POSTOPERATIVE MANAGEMENT

Postoperatively, the patient is observed for several hours and may be discharged the same day. Antibiotics are given by mouth for the next 5 days and mild analgesics are prescribed. Half-strength hydrogen peroxide is used as a gargle for 5 days. Generally, the patient's original pain is relieved immediately by removal of the styloid process.

It is possible to remove the styloid process through an external procedure; however, the transoral approach is so direct, simple, and brief that we have not used the external approach. A description of this surgery may be found in the excellent article by Strauss and colleagues.[2]

PEARLS

- The most difficult part of this procedure is considering the diagnosis in a patient with a chronic sore throat.
- CT scanning can confirm the diagnosis and provide information regarding the surrounding anatomic structures.
- The transoral approach avoids scar formation and potential damage to the carotid artery.

- Injury to the carotid artery or glossopharyngeal nerve may be avoided by careful and limited dissection directly on the styloid process.

PITFALLS

- Beware of the possibility of an incorrect diagnosis.
- Injury to the carotid artery, which lies just deep to the styloid process, is a potential complication.
- Injury to the glossopharyngeal nerve is possible as well.
- Bleeding from the operative site may be encountered.
- Incomplete removal of the styloid process may result in the patient's symptoms not being relieved.