

## The hidden spear: A case series on elongated styloid process

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### ABSTRACT

The styloid process (SP) is a slender, pointed projection of the temporal bone at the base of the skull, typically 20–30 mm long. It serves as a crucial anchor for muscles and ligaments involving the tongue and larynx. When its length exceeds 30 mm or when the stylohyoid ligament becomes calcified, it is termed an elongated SP. In some cases, this condition is associated with Eagle syndrome. Eagle's syndrome refers to unilateral or bilateral elongation of the SP or calcified stylohyoid ligament, along with other symptoms, such as dysphagia, otalgia, tinnitus, and globus pharyngeus. Many individuals with an elongated SP do not show any symptoms, and the condition is often discovered incidentally on radiographs. Early diagnosis is important to prevent confusion with other causes of orofacial pain and to provide appropriate treatment. Awareness among dental practitioners, especially in oral medicine and radiology, is essential for the proper identification and management of this condition. The present case series report covers cases of elongation of the SP as incidental findings, discussing clinical and radiographic features along with a brief review of the literature.

**Key words:** Eagles syndrome, Elongated, Incidental findings, Styloid case series, Styloid process

The styloid process (SP) of the temporal bone is a slender projection attached to the base of the skull and the stylohyoid apparatus. It extends from the tip of the SP, and the stylohyoid ligament passes downwards and forwards to the lesser cornu of the hyoid bone [1]. Elongated SP is an anatomical variation in which the SP of the temporal bone exceeds its normal length, usually considered abnormal when measuring more than 30 mm. It may occur due to elongation of the SP or calcification/ossification of the stylohyoid ligament complex. This condition is commonly associated with Eagle's syndrome, where the elongated process causes irritation or compression of adjacent neurovascular structures. Patients may present with a wide spectrum of symptoms such as throat pain, foreign body sensation, dysphagia, facial pain, otalgia, headache, and cervical discomfort. Due to its non-specific clinical presentation, it is often misdiagnosed as temporomandibular disorders, neuralgia, or chronic pharyngeal conditions. Radiographic evaluation plays a crucial role in diagnosis, with panoramic radiographs serving as an initial screening tool, while cone beam computed tomography provides an accurate three-dimensional assessment of the SP [1].

This case series aims to highlight the clinical and radiographic features of elongated SP and emphasize

the importance of early diagnosis for appropriate management.

### CASE SERIES

#### Case 1

A 48-year-old male patient reported to the department of oral medicine and radiology with the chief complaint of mobility of teeth in the lower front teeth region for the past 5–6 months, associated with bleeding gums. Medical history was non-contributory. No history of trauma or systemic illness was reported. On intraoral examination, generalised attrition was evident along with grade 2 mobility wrt 36 42, multiple teeth were found missing, including 16, 17, 27, 31, 32, 37, 41, 42. Overall oral hygiene status was poor. On extraoral examination, no facial asymmetry or swelling was noted. An orthopantomogram (OPG) showed an incidental finding of a well-defined radiopaque mass with a thin radiolucent rim exhibiting a tooth-like structure in the maxillary left front region, associated with an unerupted, impacted, horizontally placed canine. Ghost images of ear ornaments were noted bilaterally. An elongated SP was observed bilaterally, with the length of the left side styloid greater than the right side. Based on radiographic findings, a diagnosis of bilateral elongated styloid was established (Fig. 1).

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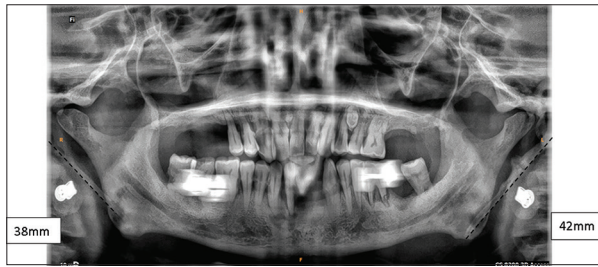
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**Figure 1: Orthopantomogram revealing bilateral elongated styloid process (Case 1)**

### Case 2

A 55-year-old female patient visited the department of oral medicine and radiology with a chief complaint of pain during opening and closing of the mouth in both right and left facial regions for the past 1 year. Medical history was non-contributory. No history of trauma or systemic illness was reported. On intraoral examination, generalised attrition was evident along with grossly decayed 16, 17, and root stumps in 36, facets were evident in 26, 27, 37, 46, 47, 48. Overall oral hygiene status was poor. On extraoral examination, no facial asymmetry or swelling was noted. OPG shows: multiple decayed teeth without any deformity in the temporomandibular joint (TMJ) region. Bilateral elongated SPs were observed, with the length of the right styloid greater than the left (Fig. 2).

### Case 3

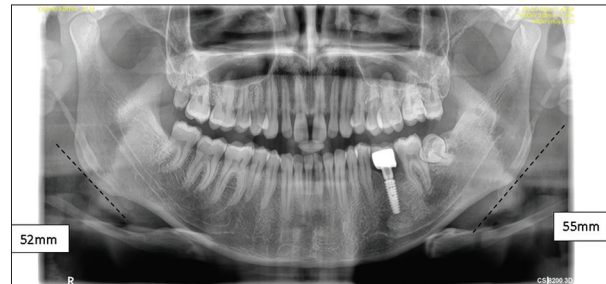
A 35-year-old male patient visited the department of oral medicine and radiology with a chief complaint of pain in the lower left back teeth region for the last 1 month. Medical history was non-contributory. No history of trauma or systemic illness was reported. On intraoral examination, midline diastema was evident along with microdont wrt 18, deep pit and fissures were evident in 16, 26, 47, along with mild calculus, overall oral hygiene was fair. On extraoral examination, no facial asymmetry or swelling was noted. OPG shows mesioangular impacted 38, microdont wrt 18, 28, with normal TMJ anatomy. Bilateral elongated SPs were observed, with the length of the left styloid greater than the right (Fig. 3).

### Case 4

A 35-year-old male patient visited the department of oral medicine and radiology with a chief complaint of loose teeth in the maxillary right back teeth region for the last 15 days. Medical history was non-contributory. No history of trauma or systemic illness was reported. On intraoral examination, generalised attrition was evident, supraeruption of 17 was evident along with grade 3 mobility, multiple teeth were missing, including 16, 35, 46, and 47. Overall oral hygiene status was poor. On extraoral examination, no facial asymmetry or swelling was noted. OPG shows mesioangular impacted 18, microdont wrt 18 with normal TMJ anatomy. Bilateral



**Figure 2: Orthopantomogram revealing bilateral elongated styloid process (Case 2)**



**Figure 3: Orthopantomogram revealing bilateral elongated styloid process (Case 3)**

elongated SPs were observed, with the length of the left styloid greater than the right (Fig. 4).

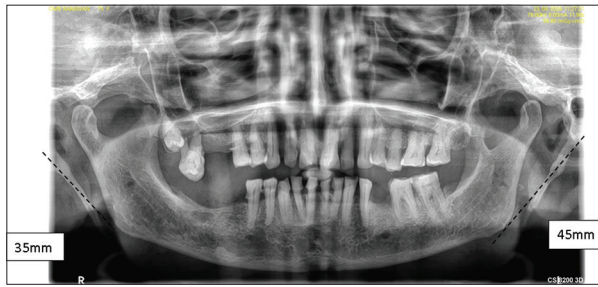
### Case 5

A 41-year-old male patient visited to the department of oral medicine and radiology with a chief complaint of pain during opening and closing of the mouth on both right and left facial regions for the past 2 years. Medical history was non-contributory. No history of trauma or systemic illness was reported. On intraoral examination, a prosthesis was evident in 11, 21, and partially erupted 38 was seen. Overall oral hygiene status was fair. On extraoral examination, no facial asymmetry or swelling was noted. OPG shows: no evident findings. Bilateral elongated SPs were observed, with the length of the right styloid greater than the left (Fig. 5).

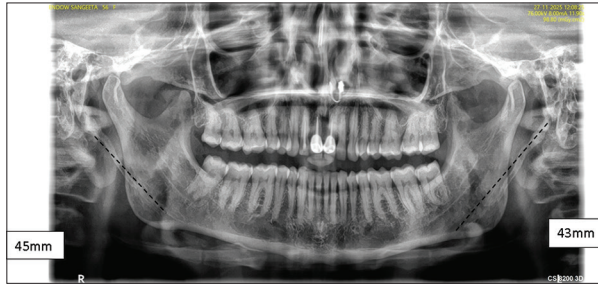
## DISCUSSION

The SP of the temporal bone is a slender projection attached to the base of the skull and the stylohyoid apparatus. It extends from the tip of the SP; the stylohyoid ligament passes downwards and forwards to the lesser cornu of the hyoid bone. All these structures are derived from the second branchial arch cartilage [2]. Eagle's syndrome, characterized by pain secondary to stimulation of the cranial nerves is caused by the long SP or the calcified stylohyoid ligament. Pain in the cervicofacial region that can spread to the ear, neck, TMJ, or upper extremity, change with head position, and difficulty in swallowing and throat [3].

The etiopathogenesis of Eagle's syndrome is still believed to be uncertain. Various theories have been proposed, including (a) congenitally elongated SP due to perseverance of the stylohyoid cartilage,



**Figure 4: Orthopantomogram revealing bilateral elongated styloid process (Case 4)**



**Figure 5: Orthopantomogram revealing bilateral elongated styloid process (Case 5)**

(b) idiopathic calcification of the stylohyoid ligament, and (c) ossification at the origin of the stylohyoid ligament [4]. The pathogenesis of the SP elongation is unclear. Explanations which have been put forward include congenital elongation, calcification of the stylohyoid ligament, and growth of osseous tissue at the insertion of the stylohyoid ligament. The exact cause of pain is unknown. Postulated mechanisms include fracture of the ossified stylohyoid ligament with non-union, compression of the glossopharyngeal nerve by the elongated process, direct irritation of the pharyngeal mucosa by the elongated process, and impingement on the carotid vessels, producing irritation of the sympathetic nerves.

There are several conditions which cause discomfort in the throat, pain, odynophagia, and referred otalgia. These include primary glossopharyngeal neuralgia, TMJ disease, chronic pharyngotonsillitis, impacted molars, and also the tumors of the pharynx and base of the tongue. Detailed history and clinical examination, along with radiological investigations, help in diagnosing Eagle's syndrome [5].

The pathophysiological mechanism of symptoms is not very clear. However following theories are proposed [6]: (a) Traumatic fracture of the styloid causes proliferation of granulation tissue, which compresses the adjacent structures; (b) Compression of adjacent nerves, glossopharyngeal, lower branch of the trigeminal, or chorda tympani. (c) Stylohyoid insertion tendonitis; (d) Irritation of pharyngeal mucosa by direct compression or post-tonsillectomy scarring; (e) Impingement of carotid vessels, producing irritation of sympathetic nerves in the arterial sheath.

Differential diagnosis in patients with similar symptomatology includes TMJ diseases, trigeminal, glossopharyngeal neuralgias, temporal arteritis,

chronic pharyngotonsillitis, otitis media, external otitis, mastoiditis, dental pain, improperly fitting dental prostheses, submandibular sialadenitis or sialolithiasis, true pharyngeal foreign bodies, and tumors of the pharynx or tongue base, etc. Laryngopharyngeal dysesthesia, temporomandibular arthritis, hyoid bursitis, Sluder's syndrome, histamine cephalgia, cluster-type headache, esophageal diverticula, cervical vertebral arthritis, and migraine-type headache should also be considered [7,8]

Treatment of such cases may be conservative or surgical. The former includes antiepileptics, antihistaminics, vasodilators, neuroleptics, antidepressants, and tranquilizers [9]. Injection of corticosteroids diluted in local anesthetic close to the SP is another alternative and is diagnostic as well as palliative [10]. Surgical removal has been described both intraorally as well as extraorally, but there are reports of recurrence of symptoms postoperatively, questioning the benefits of surgical technique [11].

## CONCLUSION

This case series signifies the importance of OPG interpretation in routine dental practices. Sometimes misdiagnosis can lead to a wrong treatment plan and a poor prognosis. In this case series, most of the patients presented with different chief complaints, but on radiographic interpretation, an elongated SP was found to be the culprit. This case series reinforces that an elongated SP remains a frequently overlooked differential in the evaluation of chronic orofacial and pharyngeal pain; a thorough clinical history is the most critical tool for distinguishing Eagle Syndrome from other neuralgias. We conclude that surgical intervention via a transoral or transcervical approach provides significant long-term symptomatic relief with minimal morbidity, provided that patient selection is meticulous.

## REFERENCES

1. Semmanaselvan K. Elongated styloid process-a case report. *Otolaryngology* 2012;2:1-3.
2. Rodriguez-Vazquez JF, Merida-Velasco JR, Verdugo-Lopez S, Sanchez-Montesinos I, Merida-Velasco JA. Morphogenesis of the second pharyngeal arch cartilage (Reichert's cartilage) in human embryos. *J Anat* 206;208:179-89.
3. Ceylan A, Köybaşıoğlu A, Çelenk F, Yilmaz O, Uslu S. Surgical treatment of elongated styloid process: Experience of 61 cases. *Skull Base* 2008;18:289-95.
4. Diamond LH, Cottrell DA, Hunter MJ, Papageorge M. Eagle's syndrome: A report of 4 patients treated using a modified extraoral approach. *J Oral Maxillofac Surg* 2001;59:1420-6.
5. Ansari SH, Nilakantan A, Dutta A. Elongated Styloid Process Syndrome (Eagle's Syndrome). Available from: <https://my.clevelandclinic.org/health/diseases/eagle-syndrome> [Last accessed 2026 Jan 23].
6. Singla RK, Shree B, Sharma RK. Bilaterally elongated styloid process: A case report. *Int J Anat Radiol Surg* 2014;3:6-9.
7. Beder E, Ozgursoy OB, Ozgursoy SK. Current diagnosis and transoral surgical treatment of Eagle's syndrome. *J Oral Maxillofac Surg* 2005;63:1742-45.
8. Savranlar A, Uzun L, Ugur MB, Ozer T. Three-dimensional CT of

- eagle's syndrome. Diagn Interv Radiol 2005;11:206-9.
9. Gervickas A, Kubilius R, Sabalys G. Clinic, diagnostics and treatment peculiarities of eagle's syndrome. Stomatol Balt Dent Maxillofac J. 2004;6:11-3.
  10. Palsy P, Murray GM, De Boever J, Klineberg I. The involvement of the styloid process in head and neck pain. J Oral Rehabil. 2000;27(4):275-87. doi: 10.1046/j.1365-2842.2000.00515.x.
  11. Jain S, Bansal A, Paul S, Prashar DV. Styloid-stylohyoid syndrome. Ann Maxillofac Surg 2012;2:66-9.

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