

## Case Report

# Management of bilateral Eagle's syndrome with pharmacotherapy: a case report

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**Abstract** – Eagle's syndrome is a frequently overlooked nosological condition that arises from an elongated styloid process or calcified stylohyoid ligament, resulting in varying degrees of cervicofacial or craniofacial pain. Diagnosis typically relies on a physical examination of the styloid process in the tonsillar fossa, which exacerbates pain during neck movements. Radiographic evaluation should encompass orthopantomography (OPG) and Cone Beam Computed Tomography (CBCT), revealing styloid elongation exceeding 3 cm. While surgical reduction of the styloid process *via* intraoral or external approaches remains the cornerstone, some patients benefit from pharmacological interventions. Here, we elucidate the case of a 37-year-old woman experiencing cervicofacial pain exacerbated by neck movements, opting for conservative therapy with gabapentin, amitriptyline, and paracetamol. Her symptoms markedly improved over a three-month follow-up period.

## Introduction

Eagle's syndrome (ES), first described by Watt W. Eagle in 1937, is characterized by nonspecific neck and throat pain due to an elongated Styloid Process (SP) [1]. The normal SP length is approximately 2–3 cm, and lengths exceeding this range are considered elongated [2]. While the exact etiology remains unclear, several hypotheses have been proposed, including congenital elongation from persistent embryonic cartilaginous outgrowth, calcification of the stylohyoid ligament, and ossification at the ligament's insertion site [3].

Clinical manifestations include cervicofacial pain radiating to the ear and dysphagia, often resulting from carotid artery irritation or compression of cranial nerves such as IX, V, VII, and X [4]. It is important to note that an elongated or calcified styloid process alone does not confirm ES, as only 7.8% to 10.3% of patients with elongated styloid processes experience symptoms [5]. Diagnosis is primarily based on clinical findings, such as cervicofacial pain and a palpable bony mass in the tonsillar fossa, alongside radiographic evaluations, including panoramic radiographs, lateral skull imaging, and CBCT, which reveal the elongated styloid processes. Additionally, local

anesthetic infiltration with lidocaine or xylocaine in the tonsillar fossa can relieve pain and cranial nerve irritation symptoms [6].

The clinical differential diagnosis includes cranial neuralgias, referred pain from the temporomandibular joint (TMJ), myofascial pain dysfunction, cervical arthritis, temporal arteritis, tension headaches, muscle spasms, tonsillitis, tonsillar calculi, and spasms of the pharyngeal constrictor muscle.

Management strategies depend on understanding the pathogenesis, pain severity, and patient preferences. Treatment options are divided into conservative approaches, including multidrug regimens of anticonvulsants, antidepressants, analgesics, local injections, and manipulative therapies, as well as surgical interventions, with a preference for conservative measures as the initial treatment [6]. In this paper, we present a case of chronic bilateral neck pain radiating to the ear, successfully managed with pharmacological treatment. Additionally, we discuss several cases of ES effectively treated with a multidrug regimen, avoiding the need for surgery.

## Case history

A 37-year-old female presented with chronic bilateral neck pain intermittently radiating to the ear over the past six years. The pain, rated at a moderate level 4 on the Visual Analog Scale, typically lasted between 5 and 10 min and occurred 2 to

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**Fig. 1.** OPG showing bilateral elongation of the styloid process.

3 times per day. Additionally, she noted that the pain was exacerbated during neck movements, swallowing, and coughing, but occasionally pain was alleviated by over-the-counter analgesics during active episodes. Her medical history was unremarkable. Upon general physical, cranial nerve, lymph node, and TMJ examination no abnormalities were detected. A consultation with an ear, nose, and throat specialist was pursued to rule out sinus, ear, and throat pathologies. During neck examination, tenderness and a bony prominence were noted in the tonsillar region bilaterally leading to pain radiating to the ear. The OPG and CBCT revealed bilateral elongation of the styloid process, tapering, measuring over 4 cm in length, with a diameter of 3 mm at its thickest point (Figs. 1–3). The left side appeared denser and more calcified. Based on clinical and radiological findings, a diagnosis of Eagle syndrome was made.

A medical treatment was initiated for the patient in consultation with a neuro physician, consisting of gabapentin 300 mg/day (Neurontin), amitriptyline 10 mg/day (Apo-Amitriptyline), and paracetamol 500 mg/day for six weeks. Following this treatment, the patient reported a reduction in pain intensity to 2, with pain-free intervals; however, the pain persisted during neck movements, swallowing and coughing. Continuation of gabapentin 300 mg/day, amitriptyline 10 mg/day, and paracetamol 500 mg once daily was advised for an additional six weeks. After three months of treatment, the pain intensity decreased to 1, and the patient continued to have pain-free intervals during the subsequent three months of follow-ups.

## Discussion

Eagle's syndrome typically presents with vague cervicofacial and craniofacial pain, which is diagnosed through palpation of the tonsillar fossa and supported by radiographic imaging such as OPG and CBCT, as seen in the current case where clinical assessment was supplemented by radiographs [1]. Additional diagnostic measures include a lidocaine infiltration test to alleviate discomfort and comprehensive blood work to rule out potential systemic pathologies [6].

The varied and elusive pain associated with styloid elongation likely arises from the intricate neurovascular structures and muscular attachments in the region, making

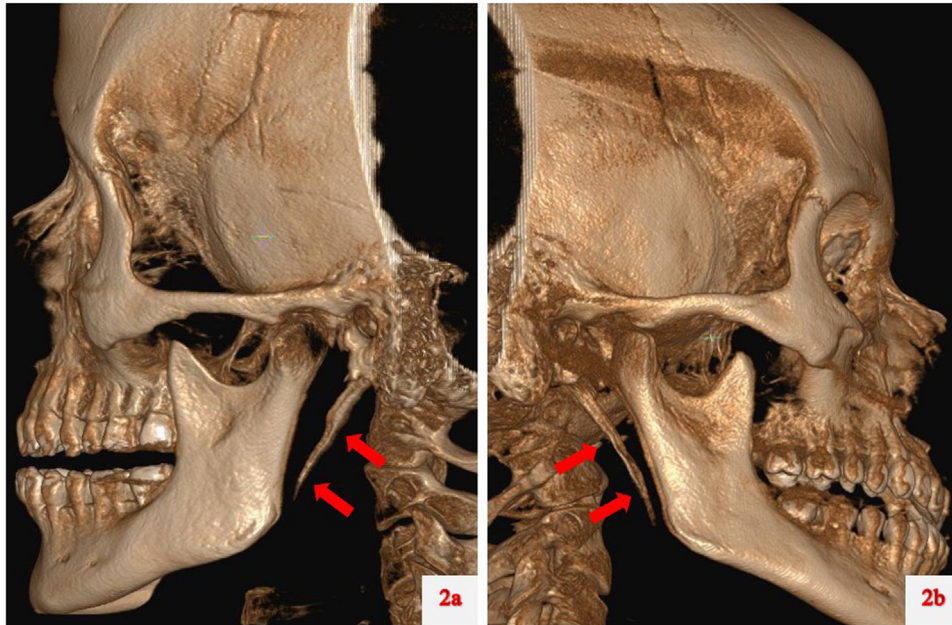
timely diagnosis challenging and often leading to misdiagnosis or delayed referral to specialists. The availability of definitive diagnostic tests and criteria, as mentioned earlier, suggests that ES should not be regarded as a diagnosis of exclusion. Rather, it should be routinely considered in the differential diagnosis of cervicofacial pain [6,7]. In our case, the styloid process measured 4 cm bilaterally, which is considered elongated on CBCT. Tenderness and a bony protuberance were detected through palpation of the tonsillar fossa, with pain radiating to the ears. These symptoms were likely due to the elongated styloid process stimulating surrounding cranial nerves.

Management is tailored to the severity and underlying cause of each case, allowing for conservative approaches, including physiotherapy and pharmacotherapy. A variety of medications are used in medical management, such as antidepressants (amitriptyline, tianeptine), anticonvulsants (gabapentin, pregabalin), analgesics (tramadol, acetaminophen), steroids, and long-acting anesthetics. However, patients who do not respond favorably to pharmacotherapy may require surgical intervention targeting the styloid process through either an intraoral or extraoral approach [8].

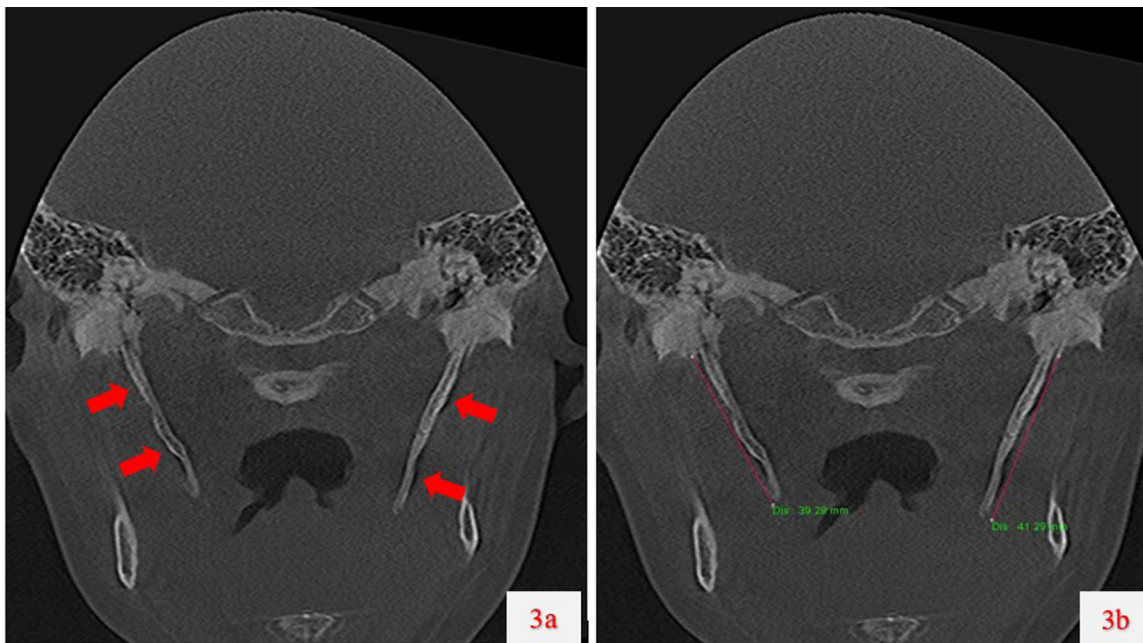
In this specific case, following diagnosis, we initiated treatment with amitriptyline, gabapentin, and paracetamol. Notably, the patient responded positively to conservative therapy, showing significant improvement after 3 and 6 weeks of treatment. The severity of pain decreased by 50% within the first 3 weeks, and the pain score dropped to 1 after 6 weeks. These medications alleviate pain by reducing nerve stimulation and diminishing pain intensity through neurotransmitter modulation. Analgesics help by reducing inflammation of the surrounding tissues caused by the elongated styloid process [6]. It is noteworthy that we refrained from using localized steroid or anesthetic injections or a stellate ganglion block, relying solely on oral medications. This approach aligns with Taheri *et al.* [7], who used amitriptyline and pregabalin, achieving an 80% reduction in pain severity with prolonged pain-free periods of up to six months.

Han *et al.* [8] supplemented oral medication with local administration of 1 ml triamcinolone (10 mg) and 3 ml of 0.3% mepivacaine, along with a stellate ganglion block, providing temporary relief during a 3-month follow-up. Additionally, Maher *et al.* used ultrasound-guided injections of steroids or local anesthetics into the tonsillar fossa with a 1.5-inch, 25-gauge needle to ensure precise identification of neurovascular structures near the styloid process, minimizing the risk of damaging these vital components [9]. Local injections serve as a temporary measure for patients awaiting surgery or as an alternative for those who decline surgical resection of the ossified styloid process [9]. The proponents of surgical management of the styloid process contend the safety, efficacy, and side effects of various drug classes, as well as the risks of injury due to injections into the styloid process [10].

The success rate of surgical treatments varies depending on the approach used. The intraoral approach to stylolectomy demonstrated complete symptom resolution in 84% of



**Fig. 2.** (a and b) 3D CBCT images showing elongation of the styloid process on both sides.



**Fig. 3.** (a and b) CBCT images of styloid process with measurements.

patients, with partial improvement in the remaining 16% [11]. In contrast, the extraoral approach reported a higher success rate of 93.4%. An earlier systematic review indicated success rates of 84.2% for cervical approaches and 73.7% for transoral methods [10,12]. Although the exact success rate has not been clearly reported in the literature, a review based on case reports documented a 64.3% cure rate for medicinal treatments [10]. However, this review did not include recent case reports that documented complete symptom relief. Some authors also

observed a recurrence of symptoms upon discontinuation of medication. For instance, pregabalin has been shown to provide effective relief, but only with continuous use [13]. Most medically managed cases experienced short-term pain alleviation, making it a viable option when pain is not severe or surgery is contraindicated.

If left untreated, ES can lead to a range of complications. The most severe complications involve cerebrovascular events and cranial nerve palsies, while the most common

issue is misdiagnosis, resulting in delays of either conservative or definitive treatment. It is therefore crucial that physicians become more adept at diagnosing and managing ES [6].

## Conclusion

ES poses a diagnostic challenge for both dentists and physicians due to its nonspecific clinical presentation. We report a case of bilateral ES that responded well to conservative management without the need for invasive treatments. Based on this, we recommend that conservative therapy be the first-line approach in symptomatic cases, with additional treatment options considered based on the patient's response. Moreover, ES should be included in the differential diagnosis for patients presenting with unexplained neck pain.

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## Conflicts of interest

The authors declare no competing interests with regards to the authorship and/or publication of this article.

## Data availability statement

The data can be accessed by sending an email request to the corresponding author.

## Informed consent

A written consent was obtained from the patient.

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