American Journal of Otolaryngology and Head and Neck Surgery

Review Article
Published: 27 Mar, 2026

Trismus Revealing an Eagle Syndrome: Review of the Literature

Soumaoro S[1], Diarra K[1], Sanogo H[2], Danielle Fengui K[1], Konaté N[1], Guindo B[1], Bagayoko DK[2], Coulibaly K[1], Cisse N[1], Dicko I[1], Koné FI[1], Singare DK[1] and Keita MA[1]*

[1]Department of Surgery, University Hospital Gabriel Toure, Bamako, Mali

[2]Kalaban Coro Reference Health Center, Bamako, Mali

Abstract

Eagle syndrome is a radio clinical entity characterized by ossification of the stylohyoid ligament, which can manifest with clinical signs related to compression of adjacent neurovascular structures. The aim was to describe the clinical and therapeutic aspects of Eagle syndrome through a case report and a review of the literature. The patient was a 61-year-old male farmer admitted for trismus and intermittent bilateral otalgia for approximately eight years without any identifiable triggering factor. This symptomatology was associated with a sensation of fullness in the ear and sharp cervical pain radiating to the left shoulder with head rotation, swallowing, and mouth opening, resulting in limited mouth opening. ENT examination revealed moderate trismus; palpation of the submandibular regions elicited sharp pain, while otoscopy of both ears was normal. A CT scan of the facial bones revealed a styloid process measuring 71.7 mm on the right and 67.9 mm on the left. Based on clinical and CT findings, the diagnosis was bilateral Eagle syndrome. Transoral surgery was performed under general anesthesia. The postoperative course was uneventful. By day 10, the trismus and pain had completely resolved.

Conclusion: Eagle syndrome is still a very little-known entity due to the variety of symptoms and the rarity of cases.

Keywords: Eagle syndrome; Syloid process

Introduction

Eagle's syndrome was first described by Eagle in 1937 [1]. It is a radio clinical entity characterized by ossification of the stylohyoid ligament, which can manifest with clinical signs related to compression of nearby neurovascular structures [1]. It is classified by the IASP (International Association for the Study of Pain) as a musculoskeletal disorder of the cervical region; and by the IHS (International Headache Society) as "facial or cranial pain attributed to inflammation of the stylohyoid ligament." Its pathogenesis remains poorly understood, and several hypotheses have been proposed [2]. According to the literature, the frequency of Eagle's syndrome is 4%, and only 4% of ossifications are symptomatic [1]. Although the terminology varies, the functional signs of Eagle's syndrome remain highly diverse. The most frequently encountered symptoms are neck pain exacerbated by hyperextension or sudden cervical movements; headaches; earache; a sensation of a foreign body in the throat; dysphagia; odynophagia; vertigo; and even dysphonia or trismus [3]. Incidental cases have also been reported. Nevertheless, imaging based on CT scans with 3D reconstruction allows for a definitive diagnosis [4,5]. The aim of this study is to report a case of Eagle syndrome and discuss its radio clinical and therapeutic aspects.

Observation

This is a 61-year-old male farmer admitted to the department for trismus associated with intermittent bilateral otalgia of approximately 8 years' duration and a sensation of fullness in the ear. These symptoms were associated with sharp cervical pain radiating to the left shoulder, exacerbated by head rotation, swallowing, and mouth opening, resulting in limited mouth opening. There was no history of dyspnea, dysphonia, cervical trauma, or dental surgery. The patient had previously consulted several general practitioners without success. He had no known medical or surgical history, was in good general condition (WHO score of 1), and had moderately colored conjunctiva and skin. Vital signs were normal. The ENT examination revealed moderate trismus and lancinating pain on head movement. Palpation of the submandibular regions elicited sharp pain, while otoscopy

OPEN ACCESS

Correspondence:
Kassim D, Department of Surgery, ENT Surgeon, University Hospital Gabriel Toure Bamako/Mali, E-mail: diarrakassim84@yahoo.fr

Received Date: *12 Mar 2026*
Accepted Date: *24 Mar 2026*
Published Date: *27 Mar 2026*

Citation:
Soumaoro S, Diarra K, Sanogo H, Danielle Fengui K, Konaté N, Guindo B, et al. Trismus Revealing an Eagle Syndrome: Review of the Literature. Am J Otolaryngol Head Neck Surg. 2026; 8(2): 1271.

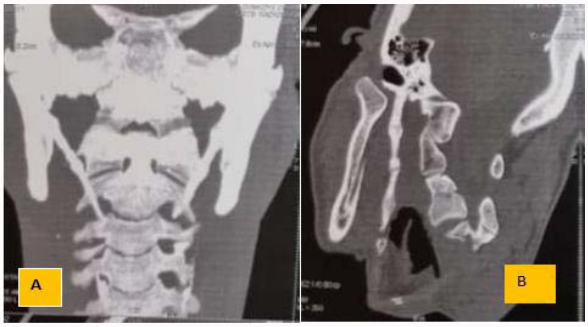

Figure 1: (A) Coronal CT scan image of facial massif showing bony processes in the direction of the hyoid bone evidence of the long styloid processes. (B) Sagittal CT scan image highlighting a long, straight segmental styloid process.

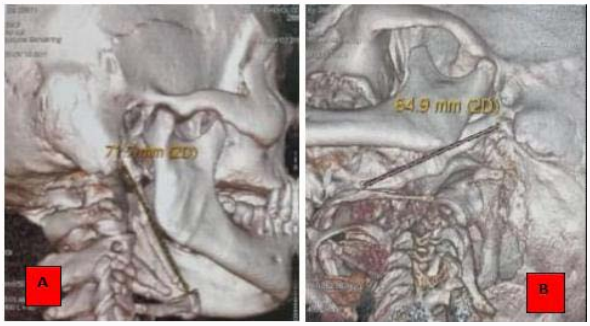

Figure 2: (A) Maxillofacial CT scan with 3D reconstruction showing a straight bony process extending from the apophysis styloid process towards the lesser horn of the hyoid bone indicating ossification of the stylohyoid ligament. (A) Reconstruction showing a straight line 71.7 mm long. (B) Reconstruction showing a left styloid process extending from the apophysis styloid process towards the lesser horn of the hyoid bone indicating ossification of the stylohyoid ligament left, 64.9 mm long.

of both ears was normal. The remainder of the ENT examination was unremarkable (Figure 1 and 2). A cervical CT scan revealed a styloid process measuring 71.7 mm on the right and 64.9 mm on the left, with no signs of involvement of adjacent organs. Standard pre-operative assessments were normal. A diagnosis of bilateral Eagle syndrome was made. We performed transoral surgery under general anesthesia. We first carried out a tonsillectomy, followed by excision of the styloid processes on the left and then on the right. The postoperative course was uneventful, and the patient was discharged with antibiotics and analgesics. At a follow-up appointment on postoperative day 5, significant symptom improvement was already noted. By day 10, the trismus and pain had completely resolved (Figure 3 and 4).

Discussion

Diagnostic aspects

Eagle's syndrome was first described by Eagle in 1937. It is a radio clinical entity characterized by ossification of the stylohyoid ligament; the clinical presentation is related to compression of neighboring structures [1,6]. It is generally observed in young adults (20-40 years old) with a marked female predominance, and the condition is very often bilateral [7].

Its pathogenesis remains unknown, and several hypotheses have been proposed. The first suggests that the excess length could be

Figure 3: (A) Intraoperative image via transoral approach showing a long left styloid process after muscle dissection and section of its temporal attachment. (B) Surgical specimens.

Figure 4: Image of the patient 5 days post-surgery showing a clear regression of trismus.

caused embryologically by increased calcification of the stylohyoid growth center, resulting in the formation of a long styloid process [5]. Dr. Eagle, for his part, noted that one of the reasons for the elongation of the styloid process was acquired following a traumatic or spontaneous fracture of the styloid process and hyperplasia due to previous tonsillectomies [2,6]. The stylohyoid ligament, like any ligament, can differentiate into epiphyseal bone [5]. However, a 2010 study of 502 people by Al-Khatteb, et al. [8] found that, contrary to Eagle's apprehensions, there was no relationship between styloid process length and recent trauma in the cervical region, as there was no significant difference in the occurrence of Eagle syndrome between patients with and without trauma. Indeed, it would appear that chronic tonsillitis, and therefore inflammation, is indirectly responsible for styloid process elongations [2]. The non-specificity of the clinical symptoms and the rarity of this syndrome explain the diagnostic delay [5].

The presenting symptoms vary from one study to another [9-11]. For example, in the study by Quentin Lisan, et al. [11], a sensation of a foreign body in the pharynx was noted in 95% of patients, headaches in 91%, dysphagia in 67%, neck pain in 53%, ear pain in 30%, and periorbital pain in 26% of cases. Umesh Pradhnon, et al. [9], in their case report, mentioned recurrent stinging or stabbing throat pain originating on the right side and radiating to the cheeks, forehead, and ipsilateral ears. It was exacerbated during chewing, swallowing, and sometimes with changes in head posture. The literature notes that the pain is very intense, sudden, or stabbing, and primarily located

in the pharynx and/or cervical region, but sometimes also in the ear, temporomandibular joint, face, eye, floor of the mouth, mandible, and/or skull. It is frequently triggered by swallowing, cervical rotation, or even yawning. The reason for the topographical variations in pain symptoms lies in the variations in the contact between the calcified and enlarged stylohyoid complex and either the sensory branches from the 5^{th}, 7^{th}, 9^{th}, and/or 10^{th} cranial nerves, or the sympathetic plexuses of the adventitia of the wall of the external carotid artery (responsible for the facial or peri- and retro-orbital distribution of pain) or the internal carotid artery (the pain then being more cranial in the form of parietal headaches at the vertex or supraorbital frontal headaches [11]). By comparing our study with the literature, we note similarities in presenting symptoms, notably otalgia, which was intermittent in our case, and a lancinating pain in the right and left cervical region triggered by head rotation movements and swallowing, resulting in trismus.

The semiology of Eagle's syndrome is highly variable, making it impossible to define a pathognomonic clinical picture. Eagle classifies the symptoms into three groups: The first is the "classic syndrome," combining pharyngeal discomfort, neck pain, ear pain, a sensation of a foreign body in the throat, dysphagia, taste distortion, and odynophagia. The second group is characterized by pain along the course of the external carotid artery, hence its name, "external carotid syndrome." The third group is that of the incidental discovery of ossification of the stylohyoid ligament on a cervical spine X-ray or panoramic radiograph in a clinically asymptomatic patient [6].

The diagnosis of this syndrome is frequently marked by a long period of diagnostic uncertainty. In 1948, Eagle [6] stated that he had monitored his first case for five years before considering this diagnosis and seeing the symptoms disappear after excision of the styloid process. Our patient had symptoms that had been evolving for approximately eight years and had been seen by several general practitioners who reportedly initiated nonspecific treatments without success. In the literature, the clinical examination shows the tonsillar fossa being filled by a hard mass corresponding to the elongated styloid process. Pressure exacerbates the symptoms and local tenderness. The disappearance of pain after infiltration of 1 mL of 2% lidocaine in the area of the styloid process (in the tonsillar fossa) greatly aids in the diagnosis [3].

Our patient presented with moderate trismus and stabbing pain upon palpation of the submandibular angles. The xylocaine test was not performed due to the strong clinical suspicion. We proceeded directly to the CT scan.

The gold standard imaging modality is cervicofacial CT scanning with millimeter slices and 3D reconstruction. It allows for precise analysis of the styloid process, the degree of ossification of the stylohyoid ligament, exploration of neurovascular anatomical relationships, and exclusion of other pathologies [12,13]. It also allows for classification according to Langlais in to types 1, 2, and 3, and helps determine the affected side [14,15]. In our case, the cervical CT scan revealed a bilateral elongated styloid process, as in most cases reported in the literature, measuring 71.7 mm on the right and 64.9 mm on the left.

CT angiography is recommended in stylocarotid syndrome to assess blood flow dynamics [15,16]. Lidocaine infiltration testing can be used to confirm the diagnosis in symptomatic patients. We did not consider further imaging necessary given the presenting symptoms.

Therapeutic aspects

Medical treatment: Conservative treatment options include oral antidepressants, anticonvulsants, opioids, and Nonsteroidal Anti-Inflammatory Drugs (NSAIDs). Transpharyngeal injection of steroids or local anesthetic agents may also be attempted. Physical therapy and warm compression help relax muscle spasms. These treatment options are less invasive and appropriate for some patients. Conversely, some patients may require surgery to relieve persistent pain [9].

Umesh Pradhnon, et al. Managed the patient conservatively for one year, after which a styloidectomy was recommended [9]. Our patient did not receive conservative treatment. In our case, given the length of the styloid processes, the duration of the disease, and the symptoms, we performed a bilateral styloidectomy directly.

Surgical treatment: In his seminal article, Eagle [1] noted that it was a European physician Weinlecher who at the end of the 19th century, was the first to publish the therapeutic efficacy of this surgical procedure [11,17].

Transoral surgery: In the transoral approach, a tonsillectomy is required first. The tip of the styloid process is then palpated in the tonsillar fossa, and the pharyngeal constrictor muscle is opened adjacent to it. The styloid process is then dissected subperiosteally. The average duration of the procedure is 45 minutes [3,17,18].

The intraoral or transoral approach to the styloid process was first described by Eagle. It is simple, easy, and takes less time. External scarring can also be avoided, but a disadvantage of this approach is that it offers limited visualization and there is a higher risk of injury to large vessels and deep neck infections. Umesh Pradhnon, et al. [9] initially provided symptomatic management with analgesics for their patients, but the symptoms were not relieved. They then opted for surgical management. They operated via the intraoral route because of its ease and precision.

External surgery: The extraoral procedure, as described by Chrcanovic, et al. and Loeser, et al. provides good surgical access and visualization, but external scarring is difficult to avoid. Furthermore, there is also a risk of facial nerve injury and a longer surgical duration [9]. In a series described by S. Kallel, et al. the external approach was preferred due to its superior surgical exposure. Surgical treatment of Eagle syndrome has been helpful in relieving symptoms, with the exception of headaches. Therefore, patients with Eagle syndrome should be carefully evaluated before surgery to rule out other possible conditions that may mimic the same clinical presentation.

We performed surgical treatment using the transoral approach due to the absence of vascular complications.

Follow-Up after the intervention: Umesh Pradhan, et al. prescribed intravenous antibiotics (ampicillin) and oral care (Betadine mouthwash), and the patient was discharged on the second postoperative day with oral antibiotics (amoxicillin). The patient was followed up one week later, at which point he complained of dull pain, unlike the sharp, stabbing pain he had experienced previously. There was healthy desquamation of the tonsil bed without clots or bleeding. The patient was given analgesics (ibuprofen) to relieve the symptomatic pain and requested a follow-up appointment in one month. At the follow-up visit, he reported the complete resolution of the pain he had previously experienced. Pradhan and Adhikari [9,19,20].

Quentin Lisan, et al. Realizes that regardless of the mode of analysis used (overall rate for series or regression model for clinical cases), the cure rate after styloidectomy was higher if a cervical approach was used, compared to the transoral approach (respectively 84.2% *vs.* 73.7% for the series retained and 95.8% *vs.* 89.1% for the clinical cases retained in our literature review).

The fact that the overall average cure rate after styloidectomy of 73.7% across the twelve published series is lower than the 91.8% obtained in the analysis of clinical cases without neurological deficits in our literature review reflects, in our view, the danger of clinical cases, which are very rarely dedicated to complications or treatment failures and tend to overestimate the true efficacy of treatments. Statistically, the difference noted between the two approaches in the clinical case group did not reach the threshold of significance, which does not allow us to conclude that one approach is superior to the other. Conversely, the cervical approach generated a higher percentage of complications (16.3% *vs.* 4.3%), primarily dysfunction of the 7^{th}, 9^{th}, 10^{th}, 11^{th}, and/or 12^{th} cranial nerves, again without a statistically significant difference compared to transoral styloidectomy. While no link has been established between the complete disappearance of painful symptoms and the length, morphology, angulation, or degree of resection of the affected styloid process, a review of the literature highlights that the persistence of pain after styloidectomy should prompt an evaluation of whether the resection was sufficient. This is particularly relevant given that Steinmann demonstrated the possibility of styloid process growth years after styloidectomy, attributing this phenomenon to the presence of cartilaginous embryonic remnants within it. In such cases, it is also important to investigate alternative causes of the pain, especially first-bite syndrome, and to assess various factors (stress, anxiety, psychiatric conditions) that may influence the patient's experience [11,21].

Conclusion

Eagle syndrome, a still relatively unknown condition discovered by Eagle in 1937, presents a variety of symptoms, the most common being cervical pain triggered by rotation and hyperextension of the head, associated with numerous other otological, pharyngeal, neurological, and vascular symptoms secondary to compression of a calcified styloid ligament that ossifies, or an elongated styloid process, which is the source of the symptoms. This mosaic of symptoms makes diagnosis difficult due to the wide range of possible manifestations.

References

1. Choumi F, Ziani Y. Eagle syndrome: report of a case. Pan Afr Med J. 2014;18:333.
2. Mularski A. Eagle and Ernest syndromes. Doctoral thesis, Faculty of Dental Surgery. 2017.
3. Pigache P, Fontaine C, Ferri J, Raoul G. Cervical styloidectomy in Eagle syndrome, Eur Ann Otorhinolaryngol Head Neck Dis. 2018;135(6):424-7.
4. Rabemanorintsoa FH, Razafindraibe KA, Rafaralahivoavy TR, Ahmad A. "EAGLE" syndrome: About a case KisMed. 2019;9(2): 353-55.
5. Bouguila J, Khonsari RH, Pierrefeu A, Corre P. Eagle syndrome: a poorly understood and poorly recognized pain. Revue de Stomatologie et de Chirurgie Maxillo-faciale. 2011;112(6):348-52.
6. EagleWW. Symptomatic elongated Styloid process; report of two cases of Styloid process-carotid artery syndrome with operation. Arch Otolaryngol. 1949;49(5):490-503.
7. Rezgui-Marhoul, Douira W, Saïd W, Bouslama K, Ben Dridi M, Hendaoui L. Eagle syndrome: a case report. Rev Stomatol Chir Maxillofac. 2004;105(1):50-2.
8. Al-Khateeb TH, Al-Dajani, Al-Jamal GA. Mineralization of the stylohyoid ligament complex in a Jordanian sample: a clinicoradiographic study. J Oral Maxillofac Surg. 2010;68(6):1242-51.
9. Pradhan U, Adhikar TR. Diagnostic and therapeutic dilemma in orofacial: A rare case of bilateral Eagle syndrome. S SAGE Open Med Case Rep. 2022:10:2050313X221116950.
10. Tanenbaum ZG, Johng SY, Parsa KM, Russo ME, Harley EH. Syndrome in the pediatric population: Eagle syndrome in the pediatric population: A case report. Clin Case Rep. 2022;10(9):e6148.
11. Lisan Q, Rubin F, Werner A, Guiquerro S, Bonfils P, Laccourreye O. Treatment of stylohyoid syndrome: a literature review using the PRISMA methodology. Eur Ann Otorhinolaryngol Head Neck Dis. 2019;136(4):281-87.
12. Okur A, Ozkırış M, Serin HI, Gencer ZK, Karaçavuş S, Karaca L, et al. Is there a relationship between symptoms of patients and tomographic characteristics of Styloid process? Surg Radiol Anat. 2014;36(7):627-32.
13. Cullu N, Deveer M, Sahan M, Tetiker H, Yilmaz M, et al. Radiological evaluation of the styloid process length in the normal population. Folia Morphol. 2013;72(4):318-21.
14. Deme H, El Hassani H, Balde D, Abouabdillah S, Badji N, Akpo LG, et al. Computed tomography aspects of Eagle syndrome at the Heinrich Lübke Regional Hospital Center of Diourbel: a report of 30 cases. JAIM. 2020;12 (4):206-12.
15. Watanabe PCA, Dias FC, Issa JPM, Monteiro SAC, De Paula FJA, Tiossi R. Elongated Styloid process and atheroma in panoramic radiography and its relationship with system osteoporosis and osteopenia. Osteoporos Int. 2010;21(5):831-36.
16. Piagkou M, Anagnostopoulou S, Kouladouros K, Piagkos G. Eagle's syndrome: a review of the literature. Clin Anat. 2009;22(5):545-58.
17. Keur JJ, Campbell JP, McCarthy JF, Ralph WJ. The clinical significance of the elongated Styloid process. Oral Surg Oral Medicine Oral Pathol. 1986;61(4):399-404.
18. Fini G, Gasparini G, Filippini F, Becelli R, Marcotullio D. The long viteid process syndrome or Eagle's syndrome. Journal of cranio-maxillofacial surgery. 2000;28(2):123-7.
19. Kallel S, Mnejja M, Maalej F, Masmoudi F, Charfeddine I, Hammami B, et al. Eagle syndrome: a rare and a typical pain. IM Sfax. 2017;(26):65-70.
20. Badhey A, Jategaonkar A, Anglin Kovacs AJ, Kadakia S, De Deyn PP, Ducic Y, et al. Eagle syndrome: A comprehensive review. Clin Neurol Neurosurg. 2017:159:34-38.
21. Ogura T, Mineharu Y, Todo K, Kohara N, Sakai N. Carotid Artery Dissection Caused by an Elongated Styloid Process: Three Case Reports and Review of the literature. NMC Case Rep J. 2014;2(1):21-25.