

Ossified Stylohyoid Ligament Associated with Carotid Artery Plaque and a Call to Action for Dentists - A Case Report

Josh Landers, Burke Soffe, John Teed

Lyon College School of Dental Medicine

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***Corresponding author:** Josh Landers, Lyon College School of Dental MedicineJ

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ABSTRACT

Introduction: Eagle syndrome (ES) is a rare condition that includes ossification of the stylohyoid ligament and can be the source of chronic cervical pain, globus sensation, dysphagia, and headaches. It can also cause direct pressure to the vascular structures, leading to carotid artery dissection and/or ischemia in the internal carotid artery. Dentists are in a unique position to diagnose ES via panoramic radiographs.

Case Report: A 47-year-old male presented with asymmetrical carotid artery plaque ipsilateral to the calcified stylohyoid ligament. Transoral removal of the front half of the ossified mass was offered if the condition became painful but not to address vascular compression.

Conclusions: Strokes and carotid artery dissections can be caused by vascular ES. It is critical that dentists are looking for ES on panoramic images to ensure that it is addressed appropriately. The asymmetrical carotid plaque suggests that the external pressure from the calcified stylohyoid ligament could facilitate the atherosclerotic process, thereby increasing the risk of a stroke.

Keywords: Vascular Eagle Syndrome; Carotid Artery Plaque; Calcified Styloid Ligament; Ossified Stylohyoid Ligament; Carotid Atherosclerosis

INTRODUCTION

Eagle syndrome (ES) was first described by the otolaryngologist Watt W. Eagle in 1937. It is caused by an elongated styloid process and/or calcified stylohyoid ligament, with these abnormal bony structures impinging on nearby anatomical tissues and vessels. Dental practitioners are often the first to detect this anomaly during a routine panoramic radiograph—an imaging modality unique to dentistry. Unlike standard medical imaging, which may be performed in a physician’s office, a panoramic x-ray is specifically taken in a dental practice using a specialized machine that captures a comprehensive, two-dimensional view of the entire upper and lower jaws, including teeth, jawbones, and associated structures in a single image (Figure 1). Recognizing an elongated styloid process on this type of dental imaging is vital, as it can be mistaken for other conditions such as temporomandibular joint disorders or dental pain. Accurate identification prevents misdiagnosis and ensures patients receive the proper referral and management.^[1,2] Dr. Eagle described the condition as unilateral throat pain with the sensation of a foreign body, and subsequently categorized two main types, depending on the

involvement of neural or vascular structures.^[1,3] The vascular type, sometimes resulting in carotid artery dissection or ischemia, can have serious cerebrovascular implications.^[4-6] Treatment may include medical management (e.g., steroids, antidepressants, anticonvulsants) as well as a range of surgical interventions.^[7]

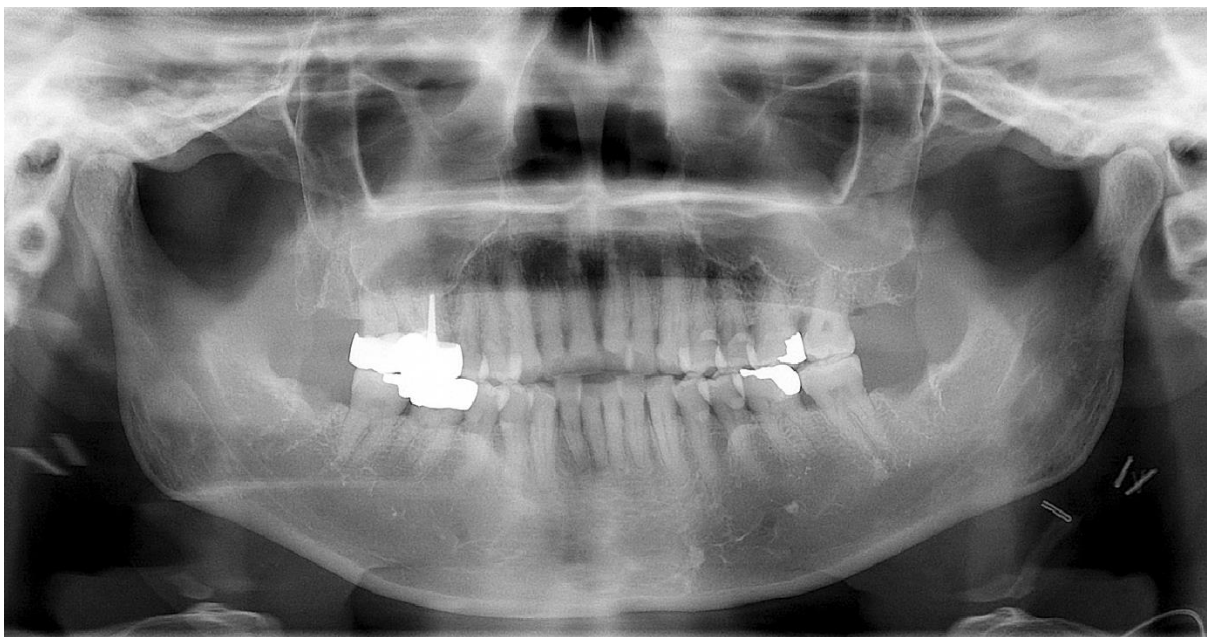
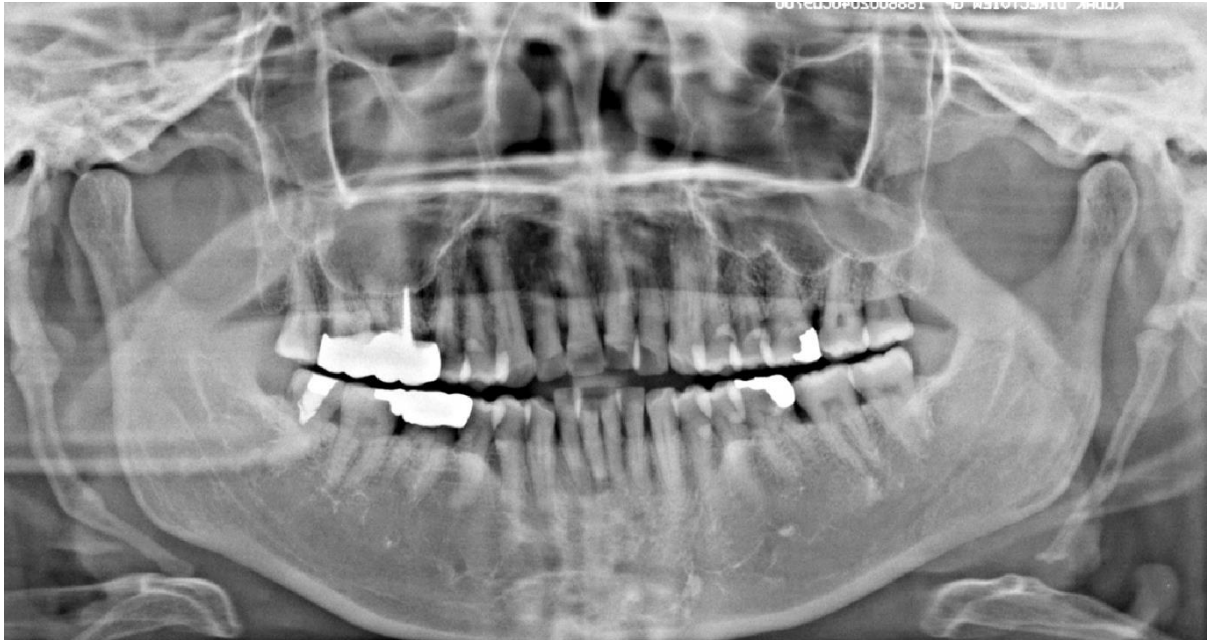


Figure 1A: Panoramic radiograph demonstrating bilateral calcified stylohyoid ligaments.

Figure 1B: Panoramic radiograph after complete removal of both of the ossified ligaments.

CASE PRESENTATION

A 47-year-old male had a stroke screening performed, which included a carotid intima-media thickness test (Figure 2). The left side showed no atherosclerotic plaque, while the right side revealed moderate plaque. The

asymmetry perplexed the medical team. Six months later, he noted dysphagia, the urge to continuously clear his throat, and a globus sensation in the right anterior neck. He saw the first otolaryngologist (ENT) who suspected an elongated hyoid bone based on the symptoms and being unable to palpate the end of the hyoid bone on the right side only. The ENT ordered a CT with contrast, which revealed a complete ossification of the right stylohyoid ligament with approximately twice the diameter of the largest diameter of the styloid process. The coronal image illustrates close approximation of the ossified stylohyoid ligament as it traverses the internal carotid artery (Figure 3).

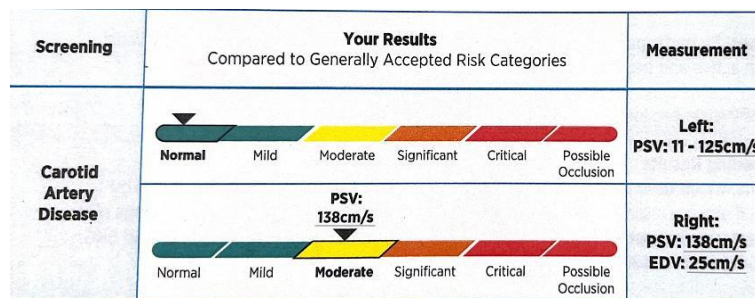


Figure 2: Results from a carotid artery intima thickness ultrasound illustrating the asymmetry in carotid artery plaque.

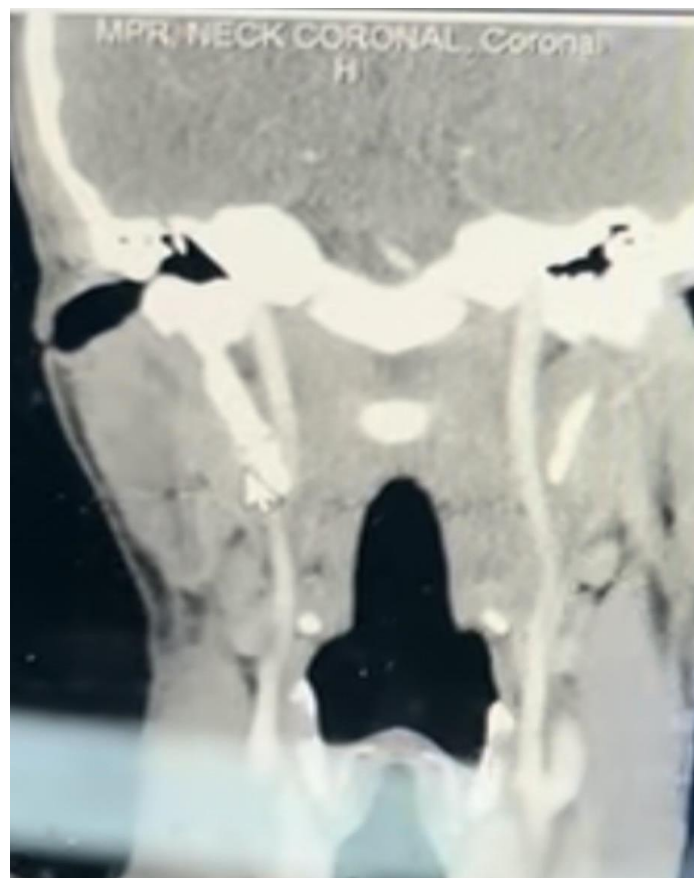


Figure 3: Computed tomography image with contrast demonstrates the approximation of the calcified stylohyoid ligament and the right carotid artery.

The first ENT noted the rarity of the condition and did not feel comfortable performing the surgery, especially with the proximity of cranial nerves and vascular structures. He recommended two ENTs who specialized in head and neck cancer because they commonly work around the neurovascular threats excising tumors. The patient, who taught pathology at the medical school, was concerned the ossified ligament could be causing the atherosclerotic plaques secondary to the external irritation. The second ENT said there was no correlation and offered a transoral robotic approach if the symptoms worsened. He noted that scar tissue in the pharynx was a common complaint after this surgery and recommended saving it as a last resort.

The patient consulted the third ENT for another opinion. This physician expressed reservations about surgery due to the risks inherent to the neurovascular proximity but would use a transcervical approach if the patient's symptoms became unbearable. He did not think the ossified stylohyoid ligament was causing the atherosclerotic plaque development but sent the images to his vascular surgeon colleague. The vascular surgeon believed it was causing the plaque and recommended surgery to prevent further development.

The patient found an ENT specializing in surgery for ES. The fourth ENT had recently published a retrospective case series where all 30 patients who participated reported that, in general, their symptoms were resolved or improved after surgery.^[8] All 30 reported seeing another physician and/or dentist for their complaints with prior unsuccessful medical or surgical intervention. As in this case, the average was four physicians and/or dentists (range = 1–10, median = 4). The fourth ENT was confident about using a transoral approach to resolve symptoms without compromising neurovascular structures. Although the symptoms were tolerable, the patient and physician decided to move forward with surgery in order to remove the external irritation of the carotid artery.

Outcome and Follow-Up

Transoral resection of the right calcified stylohyoid ligament was performed. The calcified ligament was transected where it attached to the styloid process and fractured distal 1 cm from the hyoid bone, resulting in the removal of 25 mm of calcified ligament (see Figure 4). In a follow-up visit 3.5 weeks post-operatively, the incision was healed, and all of the patient's symptoms were completely resolved.



Figure 4: The 25 mm segment of the ossified stylohyoid ligament removed with surgery.

DISCUSSION

Carotid atherosclerosis is a major risk factor for ischemic strokes, affecting middle and anterior cerebral artery territories.^[9] While the direct relationship between an elongated styloid process or calcified stylohyoid ligament and plaque formation is not definitively proven, external mechanical irritation and altered hemodynamics may predispose the artery to endothelial injury and atherosclerosis. Such localized factors could accelerate plaque development on the affected side. Early detection of Eagle syndrome by a dentist through panoramic imaging could have enabled timely intervention and management, potentially preventing the progression of carotid atherosclerosis and reducing this patient's risk of stroke.

ES detection in dentistry is pivotal. Up to 3.3% of panoramic radiographs reveal elongated styloid processes,^[10] and about 18.2% may show some mineralization of the stylohyoid complex, though most remain asymptomatic.^[11] Of those with elongated styloid processes, only 1–5% are symptomatic.^[11] Nevertheless, even asymptomatic cases warrant awareness, especially when vascular compromise is possible.

Dental professionals should recognize elongated styloid processes on panoramic images and correlate them with potential symptoms.^[10] If suspicion arises, referral to an ENT or oral and maxillofacial surgeon is recommended for further evaluation.^[12] This multidisciplinary collaboration ensures appropriate management—conservative or surgical—before severe complications such as carotid dissection or stroke occur.^[12]

CONCLUSION

This case highlights a possible association between a calcified stylohyoid ligament (Eagle syndrome) and ipsilateral carotid plaque formation.^[12] Dentists, often the first to encounter this anatomical anomaly on routine radiographs, play a critical role in early detection.^[10] Prompt recognition, patient education, and referral can prevent potentially life-threatening vascular events.^[12] Surgical intervention, when warranted and performed by experienced surgeons, can alleviate symptoms and may reduce future vascular risks.^[12] This case report underscores the challenge of locating a surgeon with the confidence and expertise to operate safely near vital neurovascular structures. For dentists, it is essential to establish a referral network that prioritizes proactive measures to protect the carotid artery, thereby minimizing the risk of stroke or arterial dissection.

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REFERENCES

1. Eagle WW. Elongated styloid process: further observations and a new syndrome. Arch Otolaryngol Head Neck Surg. 1948;47(5):630–40.
2. Kaushik A, Tanwar R, Garg P, Kaushik M, Panwar R, Garg S. Calcified stylohyoid ligaments: a diagnostic dilemma. SRM J Res Dent Sci. 2012;3(4):275.

3. Eagle WW. Elongated styloid process: symptoms and treatment. Arch Otolaryngol Head Neck Surg. 1958;67(2):172–76..
4. Raser JM, Mullen MT, Kasner SE, Cucchiara BL, Messé SR. Cervical carotid artery dissection is associated with styloid process length. Neurology. 2011;77(23):2061–6.
5. Song JH, Ahn SK, Cho CB. Elongated styloid process as a cause of transient ischemic attacks. JAMA Neurol. 2013;70(8):1072.
6. Razak A, Short JL, Hussain SI. Carotid artery dissection due to elongated styloid process: a self-stabbing phenomenon. J Neuroimaging. 2014;24(3):298–301.
7. Swanson D, Evensky CH, Yusuf S, Long H, Hasoon J, Mohamed M, et al. Eagle syndrome: pathophysiology, differential diagnosis and treatment options. Health Psychol Res. 2023;10(5):e67851.
8. Held ME, Farsi S, Weatherford Creighton ER, Davis KP, King DL, Suen, JY. Eagle syndrome presentation and outcomes in a large surgical case series. Laryngoscope Investig Otolaryngol. 2024;9(4):e1289.
9. Woo HG, Kim HG, Lee KM, Ha SH, HangJin J, Sung HH, et al. Wall shear stress associated with stroke occurrence and mechanisms in middle cerebral artery atherosclerosis. J Stroke. 2023;25(1):132–40.
10. Nogueira-Reis FA, Carvalho AC, Silva MC, Prevalence of elongated styloid process in a population using digital panoramic radiographs. Clin Oral Investig. 2021;25(7):4213–4222.
11. Bruno G, De Stefani A, De Lillo A, Balasso P, Mazzoleni S, Gracco A. Elongated styloid process: an epidemiological study on digital panoramic radiographs. Oral Radiol. 2017;33(4):279–85.
12. Selvadurai N, Magennis P, Saeed NR. Eagle syndrome presenting as dysphagia: a rare case report. BMJ Case Rep. 2022;15(3):e247954.