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Positional Facial Pain Induced by Cervical Flexion: A Case of Styloidogenic Jugular Venous Compression

A. El Hassani[1*], A. Haoufadi[1], Y. Bouktib[1], A. El Hajjami[1], B. Boutakioute[1], N. Idrissi Ganouni[1]

[1]Radiology Department, CHU Mohammed VI, University Cadi Ayyad, Marrakech, Morocco

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***Corresponding author:** A. El Hassani
Radiology Department, CHU Mohammed VI, University Cadi Ayyad, Marrakech, Morocco

Abstract | **Case Report**

Background: Styloidogenic Jugular Venous Compression Syndrome (SJVCS) is a rare variant of Eagle Syndrome in which an elongated styloid process mechanically obstructs the internal jugular vein (IJV), leading to venous outflow obstruction and intracranial hypertension-like symptoms. ***Case Report:*** We present the case of a 35-year-old female with a two-year history of progressive bilateral facial pain and cervicogenic headaches. Uniquely, her symptoms were aggravated not only by head rotation but significantly by cervical flexion ("looking down"). Computed tomography (CT) revealed bilateral styloid elongation (38 mm right, 33 mm left) causing compression of the IJVs against the lateral masses of the C1 vertebrae. Contrast-enhanced CT ruled out thrombosis, while Doppler ultrasonography confirmed hemodynamic significance, demonstrating pre-stenotic venous stasis and post-stenotic velocity acceleration. ***Conclusion:*** The patient underwent bilateral transcervical styloidectomy with complete resolution of symptoms. This case highlights the importance of recognizing cervical flexion as a potential provocative maneuver for SJVCS, which may indicate a C1 osseous conflict. It further supports the utility of Doppler ultrasonography as a functional adjunct to static CT imaging in confirming the diagnosis.

Keywords: Eagle Syndrome, Styloidogenic Jugular Venous Compression Syndrome (SJVCS), Internal Jugular Vein Stenosis, Styloid Process.

INTRODUCTION

Eagle Syndrome, first described by W.W. Eagle in 1937, is a rare condition caused by the elongation of the styloid process (>30 mm) or calcification of the stylohyoid ligament [1]. Classically, this anatomical abnormality manifests as dysphagia, otalgia, and a sensation of a foreign body in the throat due to cranial nerve irritation, or as transient ischemic attacks caused by carotid artery compression [2]. However, a third, under-recognized variant has recently emerged in the literature: Styloidogenic Jugular Venous Compression Syndrome (SJVCS) [3, 4].

In SJVCS, the internal jugular vein (IJV) is compressed between an elongated styloid process and the lateral tubercle of the C1 vertebra [3]. Unlike the arterial variant, this venous conflict can lead to cerebral venous outflow obstruction, resulting in intracranial hypertension, pulsatile tinnitus, and headaches that mimic idiopathic intracranial hypertension (IIH) [2, 4]. While diagnosis is often challenging, dynamic imaging has proven essential in identifying the mechanical obstruction, which may be position-dependent [2].

We present a case of SJVCS characterized by a complex presentation of facial pain and headaches. Notably, these symptoms were dynamically aggravated not only by head rotation but also by cervical flexion (looking down). This report details the diagnostic utility of dynamic computed tomography (CT) in visualizing this multi-positional venous conflict and describes the successful resolution of symptoms following styloidectomy.

CASE REPORT

Case Report: A 35-year-old female presented with a two-year history of progressive, bilateral facial pain and cervicogenic headaches. The patient reported that her symptoms were positional in nature, exacerbated significantly by head rotation and, notably, by cervical flexion (looking down). She denied any history of recent cervical trauma or prior neck surgery. Physical

examination revealed tenderness in the submandibular region. Cranial nerve function was intact.

Given the positional nature of her symptoms, a computed tomography (CT) scan of the neck with 3D reconstruction was performed. Imaging revealed bilateral elongation of the styloid processes, measuring 38 mm on the right and 33 mm on the left. Crucially, the scan demonstrated a mechanical conflict where the internal jugular veins were compressed between the elongated styloid processes and the lateral masses of the C1 vertebrae. Contrast-enhanced sequences confirmed that while the veins were compressed, the lumen remained patent; there was no evidence of internal jugular vein thrombosis or cerebral venous sinus thrombosis.

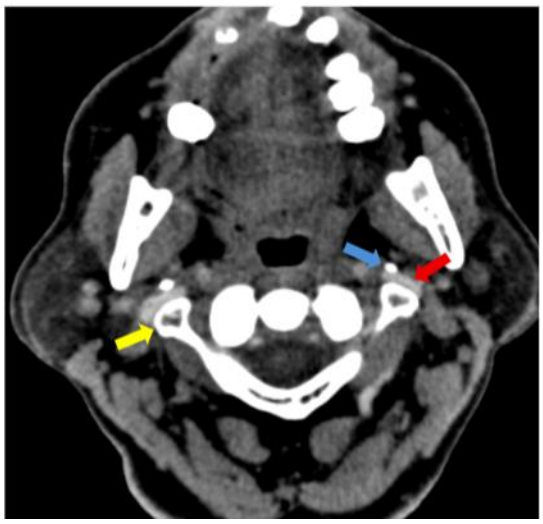

Figure 1: Axial CT images showing the compression of both internal jugular veins (red arrow) between the styloid processes (blue arrow) and transverse processes of C1 (yellow arrow)

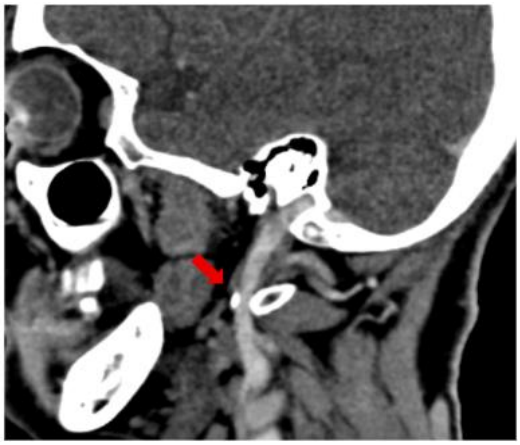

Figure 2: Sagittal CT image showing the styloidojugular veinous compression (red arrow)

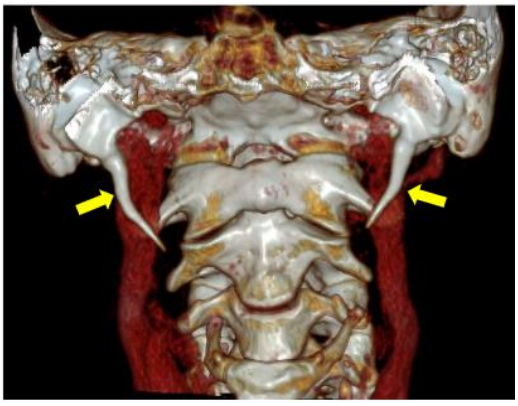

Figure 3: VRT reconstruction showing the elongated styloid (yellow arrow) processes and the venous compression

To assess the hemodynamic impact of this osseous impingement, Doppler ultrasonography was performed. B-mode imaging demonstrated dilation of the internal jugular veins cranial to the compression site, consistent with venous stasis. Spectral Doppler analysis confirmed severe flow congestion with very slow flow velocities in the pre-stenotic segments. Conversely, a marked increase in Peak Systolic Velocity (PSV) was observed in the post-stenotic tracts, confirming a high-grade stenosis with a downstream "jet effect." The patient underwent a bilateral styloidectomy via a transcervical approach. The elongated portions of the styloid processes were resected to decompress the jugular veins. Postoperatively, the patient reported immediate relief of facial pain and headaches. At the six-month follow-up, she remained symptom-free with a full range of cervical motion.

DISCUSSION

Styloidogenic Jugular Venous Compression Syndrome (SJVCS) represents a distinct and potentially debilitating variant of Eagle Syndrome. While the classic syndrome, described by Eagle in 1937, involves cranial nerve impingement or carotid artery compression [1], SJVCS is characterized by the mechanical obstruction of the internal jugular vein (IJV). The styloid process is considered elongated when it exceeds 30 mm, a finding present in approximately 4–7% of the population [5], yet only a small fraction develops symptoms. As noted by Dashti *et al.,*[3] and Mejia-Vergara *et al.,*[2], this obstruction can lead to intracranial venous hypertension, manifesting as headaches, visual disturbances, and pulsatile tinnitus that mimic Idiopathic Intracranial Hypertension (IIH) [6]. Our case aligns with these descriptions, highlighting a significant anatomical conflict at the level of C1.

The anatomical nuances of this case are significant. Previous literature has largely focused on compression between the styloid process and the lateral tubercle of C1, with symptoms triggered primarily by head rotation [2, 3]. However, anatomical studies by Jayaraman *et al.,* have shown that the IJV is most frequently compressed at the J3 segment (upper neck) [7]. In our patient, the styloid processes were significantly elongated (38 mm and 33 mm) and extended inferiorly to compress the IJV against the C1 lateral mass. We hypothesize that this osseous impingement explains the patient's exacerbation of pain during cervical flexion ("looking down"), a movement that reduces the anterior-posterior diameter of the mid-cervical space. This suggests that clinicians should assess patients not only for rotation-induced pain but also for flexion-induced symptoms, utilizing criteria similar to those proposed by Zhao *et al.,* for SJVCS [8].

Diagnostically, this case reinforces the complementary roles of CT and Doppler ultrasonography. While contrast-enhanced CT is the gold standard for visualizing the osseous anatomy and ruling out thrombosis [3, 9], it provides a static image. As demonstrated in our case and supported by Farina *et al.,*[4], Doppler ultrasonography provides critical hemodynamic data. The finding of pre-stenotic dilation with slow flow, coupled with a post-stenotic velocity spike ("jet effect"), confirmed that the anatomical compression was hemodynamically significant.

Finally, the resolution of symptoms following styloidectomy confirms the osseous etiology of the venous obstruction. Li *et al.,* and others have reported that endovascular stenting in these cases is often ineffective or dangerous due to the extrinsic rigidity of the bone, which can crush the stent [10]. Therefore, surgical decompression remains the definitive treatment. Unlike cases involving thrombosis which may require long-term anticoagulation [4], purely mechanical compression cases, such as this one, often respond rapidly to decompression alone.

CONCLUSION

Styloidogenic Jugular Venous Compression Syndrome should be considered in the differential diagnosis of positional facial pain and cervicogenic headache, particularly when symptoms are aggravated by cervical flexion. While classic descriptions focus on rotational compression, our findings suggest that pain induced by "looking down" may also correlate with osseous impingement at the C1 level. This case demonstrates that dynamic imaging—combining the anatomical precision of CT with the hemodynamic data of Doppler ultrasound—is essential for accurate diagnosis. In the absence of thrombosis, surgical styloidectomy provides effective, immediate, and lasting relief.

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