



Topics in Diagnostic Imaging

Elongated Styloid Processes and Calcified Stylohyoid Ligaments in a Patient With Neck Pain: Implications for Manual Therapy Practice^{1,2}



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Abstract

Objective: The purpose of this paper is to present a case of a patient with neck pain, tinnitus, and headache in the setting of bilateral elongated styloid processes (ESP) and calcified stylohyoid ligaments (CSL), how knowledge of this anatomical variation and symptomatic presentation affected the rehabilitation management plan for this patient, and to discuss the potential relevance of ESPs and CSLs to carotid artery dissection.

Clinical features: A 29-year-old male military helicopter mechanic presented for chiropractic care for chronic pain in the right side of his neck and upper back, tinnitus, and dizziness with a past history of right side parietal headaches and tonsillitis. Conventional radiographs showed C6 and C7 spinous process fractures, degenerative disc disease at C6/7, and an elongated right styloid process with associated calcification of the left stylohyoid ligament. Volumetric computerized tomography demonstrated calcification of the stylohyoid ligaments bilaterally.

Intervention and outcome: Given the proximity of the calcified stylohyoid apparatus to the carotid arteries, spinal manipulation techniques were modified to minimize rotation of the neck. Rehabilitation also included soft tissue mobilization and stretching, corrective postural exercises, and acupuncture. An otolaryngologist felt that the symptoms were not consistent with Eagle syndrome and the tinnitus

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was associated with symmetric high frequency hearing loss, likely due to occupational noise exposure. Initially, the patient's symptoms improved but plateaued by the fifth visit.

Conclusion: Neck pain in the presence of ESPs and CSLs can be associated with Eagle syndrome, which can include ipsilateral head and neck pain, odynophagia, dysphagia, and cerebrovascular symptoms. This case, initially thought to be Eagle syndrome, highlights proper diagnostic workup for this condition and presents potential contraindications to consider with regard to cervical spine manipulation in such patients. Manual therapy precautions pertaining to cervical spine manipulation may be appropriate in cases involving ESPs and calcified stylohyoid ligaments.

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Introduction

Neck pain is a common problem in the general population with a 12-month prevalence between 30% and 50% and a lifetime prevalence exceeding 60%.¹ Because of its frequency and often-times associated disability, people seek relief of their neck pain from a variety of health care providers.² Cervical spine manipulation and mobilization is a common procedure employed by chiropractors, physical therapists, osteopaths, and others to relieve neck pain.² Anatomical variations in the neck may present relative contraindications for various types of manipulative procedures, such as high velocity, low amplitude thrust manipulation.

Elongated styloid processes (ESP) and calcified stylohyoid ligaments (CSL) may be part of a condition known as Eagle syndrome. Named after prominent otolaryngologist Dr Watt Eagle⁴ (Fig 1), Eagle syndrome



Fig 1. Dr Watt W. Eagle, for whom Eagle syndrome is named. Photograph published with permission of Duke University Medical Center Archives.

includes a sensation of a foreign body in the throat, odynophagia, and dysphagia and often includes pain in the neck or face,³ as cranial nerves are affected by crowding or compression by the anomalous ESP or CSL. Eagle syndrome may also include symptoms suggestive of cerebrovascular compromise, such as dizziness, headache, syncope, and transient visual loss if the internal carotid artery is affected.⁴ Symptoms may be more bothersome with head and neck rotation as the structures undergo increased compression or tension from the ESP or CSL.⁴

There is literature that discusses the relevance of ESPs and CSLs to both traumatic and spontaneous internal carotid artery dissection. However, there are few publications that discuss the relevance of these neighboring anatomical structures as they pertain to manual therapies, such as manipulation or mobilization, of the cervical spine. The purpose of this paper is to present a case of a patient with neck pain, tinnitus, and headache in the setting of bilateral ESPs and CSLs and how knowledge of this anatomical variation and symptomatic presentation affected the rehabilitation management plan for this patient. We also discuss the potential relevance of ESPs and CSLs to carotid artery dissection.

Case Report

A 29-year-old male United States Marine helicopter mechanic was referred to the primary author for chiropractic care for chronic pain in the right side of his neck and upper back, which started 7 years earlier after sustaining a cervical flexion injury during Marine Corps martial arts training. At that time he fell from a height of approximately 3 ft onto the back of his head. The patient described the chronic, constant pain as an aching sensation and he felt the need to frequently stretch his neck or “crack it”; however, nothing actually provided sustained relief. Prolonged static postures, such as sustained desk work, or vigorous activity tended to aggravate the pain. He had no pain or altered sensation in his upper extremities. His pain was generally moderate in intensity, rating it a 7 out of 10 on a verbal pain scale (VPS). He had received various

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