



Letter to the Editor

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The Underdiagnosed, Understudied Complexity of Pseudoangina: Should Clinicians Take a Neurosurgical Approach in Diagnosing Unexplained Visceral Pain?

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We have read with great interest the article by Al Jammal et al.¹ regarding cervical arthroplasty as a treatment for refractory cervical angina and are eager to provide several comments which we believe may be relevant and interesting to your broad readership. In a manner akin to Al Jammal et al.,¹ we performed a comprehensive review of the literature regarding cervical angina, also referred to as "pseudoangina," which has been recently published in *Journal of Neurosurgery: Spine*.² As we describe, pseudoangina pectoris is an underdiagnosed syndrome of radiculopathy which mimics true angina pectoris but is instead the result of spinal pathology (most commonly cervical herniation, which accounted for 72.6% of the 95 patients included in our study).

Ultimately, we wish to convey gratitude to Al Jammal et al.¹ for their report on surgical treatment of cervical angina, and we hope that this detailed overview, coupled with our study, will help shed light on a condition which merits greater attention in the clinical setting. In fact, because cervical angina masquerades as cardiovascular angina pectoris, it is understudied as an important feature of the clinical differential for chest pain. Although millions of patients present to emergency departments each year with a chief complaint of chest pain, only 15%–25% of these patients are diagnosed with true ischemic angina pectoris.^{3,4} Oftentimes, angina-like pain is non-cardiac and is attributed to etiologies including psychiatric conditions, asthma, gastrointestinal disease, or musculoskeletal injury. Unfortunately, spinal pathologies are all-too-often overlooked as potential causes of angina, leaving a subset of patients either misdiagnosed or undiagnosed and unaware of the etiology of their chest pain.²

Given the importance of considering pseudoangina among the differential diagnoses for chest pain, we wish to expand upon the report provided by Al Jammal et al.¹ Their report was novel in that it was the first description of anterior cervical discectomy and arthroplasty with implant for treatment of cervical angina resulting in complete resolution of symptoms at 6-month follow-up.¹ However, their literature review only reported on pseudoangi-

na resulting from pathologies of the subaxial cervical spine (C3–7): the distribution of levels they described was C6–7 (87.3%), C5–6 (9.1%), C4–5 (1.8%), and C3–4 (1.8%). In our comprehensive study, we applied broad search criteria to find that cervical angina is not limited to the subaxial cervical spine. Among the 69 patients presenting with cervical herniation (72%) in our study, 1.5% were diagnosed with atlantoaxial (C1–2) herniation. Furthermore, our findings indicated that pseudoangina is not limited to pathologies of the cervical spine; in fact, a subset of patients presented with angina resulting from thoracic (7.3%) or cervicothoracic (C7–T1) (1.5%) herniation.² Additionally, they reported the following causes of cervical angina: disc herniation, ossification of the posterior longitudinal ligament, spinal infarction, atlantoaxial instability, and neuroforaminal stenosis. We found that, in addition to these etiologies, pseudoangina can be caused by cervical spondylotic myelopathy, infective discitis, and lipomatosis masses (spanning C8–T2 in one patient) of the spinal cord.

Our study extends the work of Al Jammal et al.¹ to show that cervical angina is a rare, underdiagnosed condition associated with a diverse set of spinal pathologies including those attributable to the thoracic spine. Together, these studies promote more interest in and awareness of rare spinal pathologies presenting with visceral symptoms, including cervical angina. Additionally, we believe that further studies should investigate thoracolumbar spinal causes of radicular pain mimicking other visceral symptoms, including acute abdomen (appendicitis-like) pain,⁵ cholecystitis, and renal/flank pain.⁶ Each of these syndromes should be the subject of future research and conversation, as some have even argued that spinal screening should be included in all examinations of visceral pain.⁷

CONFLICT OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Jammal OMA, Diaz-Aguilar LD, Srinivas S, et al. Cervical arthroplasty in the treatment of cervical angina: case report and review of the literature. *Neurospine* 2020;17:929-38.
2. Brown NJ, Shahrestani S, Lien BV, et al. Spinal pathologies and management strategies associated with cervical angina (pseudoangina): a systematic review. *J Neurosurg Spine* 2020 Dec 4:1-8. [Epub]. <https://doi.org/10.3171/2020.7.SPINE20866>.
3. Sussman WI, Makovitch SA, Merchant SH, et al. Cervical angina: an overlooked source of noncardiac chest pain. *Neurohospitalist* 2015;5:22-7.
4. Pope JH, Aufderheide TP, Ruthazer R, et al. Missed diagnoses of acute cardiac ischemia in the emergency department. *N Engl J Med* 2000;342:1163-70.
5. Khalatbari M, Yahyavi ST, Borghei-Razavi H, et al. Upper lumbar disc herniation presenting as acute abdomen. *Acta Med Iran* 2009;47:427-9.
6. Mellion LR, Ladeira C. The herniated thoracic disc: a review of literature. *J Manual Manipul Ther* 2001;9:154-63.
7. Boyling JD, Palastanga N, editors. *Grieve's modern manual therapy: the vertebral column*. 2nd ed. New York: Churchill Livingstone Inc.; 1994. p. 870.