ELSEVIER

CrossMark

The Spine Journal 14 (2014) 1909–1913

THE SPINE JOURNAL

Clinical Study

Acute neck pain caused by arthritis of the lateral atlantoaxial joint

Takashi Kobayashi, MD, PhD[a,*], Naohisa Miyakoshi, MD, PhD[b], Norikazu Konno, MD, PhD[c], Eiji Abe, MD, PhD[a], Yoshinori Ishikawa, MD, PhD[b], Yoichi Shimada, MD, PhD[b]

[a]*Department of Orthopedic Surgery, Akita Kumiai General Hospital, 1-1-1 Nishifukuro, Iijima, Akita 011-0948, Japan*
[b]*Department of Orthopedic Surgery, Akita University Graduate School of Medicine, 1-1-1 Hondo, Akita 010-8543, Japan*
[c]*Department of Orthopedic Surgery, Koto General Hospital, 37 Kawasaki-Kaiho, Hachirogata 018-1605, Japan*

Received 20 November 2012; revised 22 October 2013; accepted 29 October 2013

Abstract

BACKGROUND CONTEXT: Many diseases can cause acute neck pain in elderly individuals. We conducted the present prospective study based on the hypothesis that arthritis of the lateral atlantoaxial joint may be involved in acute neck pain in elderly patients with limited neck rotation.
PURPOSE: To clarify whether the lateral atlantoaxial joint is involved in acute neck pain among elderly individuals by conducting lateral atlantoaxial joint puncture.
STUDY DESIGN: A prospective study.
PATIENT SAMPLE: Twenty-seven patients (13 men, 14 women) aged 50 years or more who provided consent for atlantoaxial joint puncture met the following four inclusion criteria: acute neck pain with limited cervical rotation of less than 20° as the chief complaint; visual analog scale pain score of 70 mm or more at initial visit; tenderness in the paraspinal muscle of upper cervical vertebrae; and serum C-reactive protein level of 0.5 mg/dl or more.
OUTCOME MEASURES: Visual analog scale pain score and radiologic findings.
METHODS: Patients underwent puncture of the lateral atlantoaxial joint and were evaluated clinically and radiologically.
RESULTS: Computed tomography obtained before puncture showed calcification of the transverse ligament of the atlas in the posterior dens in 22 patients (81.5%), calcification in the longus colli in 2 patients (7.4%), and no calcification in 3 patients (11.1%). Of 27 patients who underwent lateral atlantoaxial joint puncture, joint fluid was collected from 16 patients (59.3%) and calcium pyrophosphate dihydrate crystals were identified in 10 patients (62.5%). For the entire patient population, mean VAS score before puncture was 81.9±16.3 mm, significantly improving to 35.6±24.4 mm by 30 minutes after puncture ($p<.001$).
CONCLUSIONS: The results of this study suggest that crystal-induced arthritis (pseudogout) of the lateral atlantoaxial joint may be closely involved with acute neck pain in the elderly.

Keywords: Acute neck pain; Lateral atlantoaxial joint; Puncture; Pseudogout; Calcification; Calcium pyrophosphate dihydrate

Introduction

Many diseases can cause acute neck pain in elderly individuals. We conducted the present prospective study based on the hypothesis that arthritis of the lateral atlantoaxial joint may be involved in acute neck pain in elderly patients with limited neck rotation. The aim of the present study was thus, to clarify whether the lateral atlantoaxial joint is involved with acute neck pain in the elderly by conducting lateral atlantoaxial joint puncture.

Patients and methods

Subjects comprised patients aged 50 years or more who visited our hospital between April 2004 and March 2008, provided consent for atlantoaxial joint puncture, and met the following four inclusion criteria: acute neck pain with

FDA device/drug status: Not applicable.

Author disclosures: ***TK:*** Nothing to disclose. ***NM:*** Nothing to disclose. ***NK:*** Nothing to disclose. ***EA:*** Nothing to disclose. ***YI:*** Nothing to disclose. ***YS:*** Nothing to disclose.

Investigation performed at the Department of Orthopedic Surgery, Koto General Hospital, Akita, Japan.

* Corresponding author. Department of Orthopedic Surgery, Akita Kumiai General Hospital, 1-1-1 Nishifukuro, Iijima, Akita 011-0948, Japan. Tel.: (81) 18-880-3000.

E-mail address: takakoba825@hotmail.com (T. Kobayashi)

1529-9430/$ - see front matter
http://dx.doi.org/10.1016/j.spinee.2013.10.054

EVIDENCE & METHODS

Context

Axial and mechanical neck pain is frequently encountered in the elderly population. While numerous spinal conditions may manifest as axial neck pain, the authors present a series supporting the contention that calcium pyrophosphate deposition (pseudogout) of the atlantoaxial joint may be responsible for some cases of neck pain associated with limited cervical rotation.

Contribution

The authors present a case series of 27 patients who presented with axial neck pain involving the proximal cervical vertebrae and limited cervical rotation. Origin of pain from the atlantoaxial joint was confirmed by mepivicaine block. Calcium pyrophosphate deposition was confirmed in 62.5% of patients who were able to have atlantoaxial joint fluid aspirated during the mepivicaine injection procedure.

Implications

This small series demonstrates that pseudogout of the atlantoaxial joint may be responsible for axial neck pain in patients with symptoms localized to the proximal cervical vertebrae and limited cervical rotation. The authors are perhaps a bit reaching in their conclusion, however, advocating that pseduogout of the atlantoaxial joint ''...may be closely involved with acute neck pain in the elderly.'' The current report represents evaluation of a select group of patients, essentially a case series, and thus provides only Level IV evidence. Moreover, the definitive diagnosis of calcium pyrophosphate deposition was confirmed in only a minority of individuals (10/27). While calcium pyrophosphate deposition should be added to the differential diagnosis of cervical spine pain in patients who present with this constellation of symptoms, the underlying cause of acute cervical pain in most elderly individuals is likely to be more mundane.

—The Editors

limited cervical rotation of less than 20° as the chief complaint; a visual analog scale (VAS) pain score of 70 mm or more at their initial visit; tenderness in the paraspinal muscle of the upper cervical vertebrae; and a serum C-reactive protein (CRP) level of 0.5 mg/dl or more (normal, <0.2 mg/dl). The study protocol of this manuscript was approved by the institutional review board at Koto General Hospital, where the study was performed.

After performing cervical computed tomography (CT), the lateral atlantoaxial joint was punctured on the side with stronger symptoms and 1 ml of 1% mepivacaine hydrochloride (Carbocaine; AstraZeneca, London, UK) was then injected. If puncture fluid could be collected at the time of puncture, microscopic analysis was performed to identify any crystals present in the joint fluid. The VAS scores were determined before and 30 minutes after the puncture. In patients who provided further consent for CT arthrography of the joint, CT was performed after injecting 1 ml of a mixture of 1% mepivacaine hydrochloride and iotrolan (Isovist 240; Schering, Berlin, Germany).

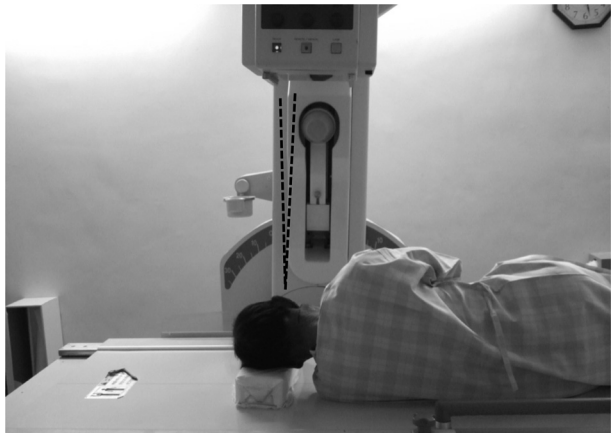

Fig. 1. The position for lateral atlantoaxial joint puncture. The patient is placed in a lateral position on a fluoroscopic table, and the X-ray tube is tilted 10° to 15° in the caudal direction to be parallel to the lateral atlantoaxial joint.

Lateral atlantoaxial joint puncture methods

The lateral atlantoaxial joint was punctured using Kusakabe method [1]. That is, the patient was placed in a lateral position on a fluoroscopic table and the X-ray tube was tilted 10° to 15° in the caudal direction to be parallel to the lateral atlantoaxial joint (Fig. 1). Using a block needle, the anterior third of the lateral atlantoaxial joint was punctured (Fig. 2). When penetration of the articular capsule

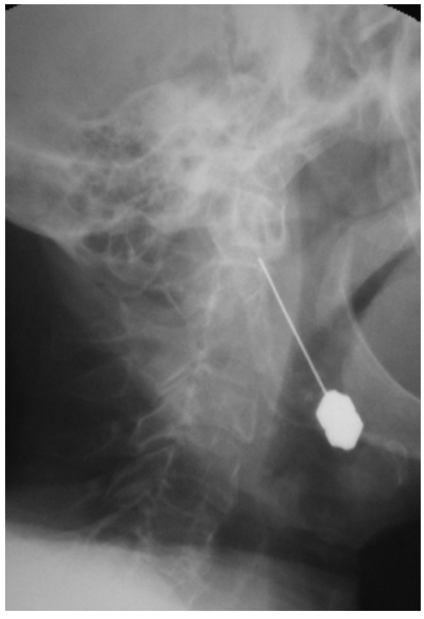

Fig. 2. Lateral view X-ray at lateral atlantoaxial joint puncture. The needle tip is placed at the anterior third of the lateral atlantoaxial joint.