SPINE Volume 28, Number 1, pp E13–E15

Acute Torticollis in an Adolescent

Case Report and MRI Study

Jean-Yves Maigne, MD,* Céline Mutschler, MD,† and Levon Doursounian, MD‡

Study Design. A case report is presented.

Objectives. To describe a typical case of acute adolescent torticollis in which a disc lesion was detected with magnetic resonance imaging.

Summary of Background Data. Acute torticollis is attributed to atlantoaxial rotary fixation of unknown etiology. The current view is that the lesion is caused by synovial fold entrapment in the C1–C2 interspace.

Methods. In a 15-year-old male adolescent, magnetic resonance imaging was performed a few hours after the onset of torticollis, and 3 weeks after resolution of symptoms.

Results. Increased signal intensity compatible with a fluid collection was seen in the right uncovertebral region at C2–C3. This lesion was probably linked to a sudden disruption of the disc collagen fibers, and had caused excessive lateral pressure, pushing C2 toward the left. Magnetic resonance imaging at 3 weeks was unremarkable.

Conclusions. The authors think that the observed disruption was a sudden and abnormal instance of a normal and, usually, very slow process of cleft formation with extension into the fibrocartilaginous core in the uncovertebral region. It is felt that this lesion may be a frequent cause of torticollis in adolescents. [Key words: acute torticollis, atlantoaxial rotary fixation, cervical spine, cervical disc] **Spine 2003;28:E13–E15**

Acute torticollis in children, adolescents, and young adults is characterized by atlantoaxial rotary fixation (rotational subluxation) of sudden onset.[1,8] The condition is usually attributed to synovial fold entrapment in the C1–C2 interspace.[3,4] A tear and invagination of capsular ligaments about the atlantoaxial synovial joints also have been suggested as an etiology.[8] More rarely, the condition is caused by an ear or upper respiratory tract infection.[2] Often, there is a history of trauma. However, the condition may be triggered by simple neck rotation. Sometimes a click is heard at the onset. In up to 25% of the cases, no clear cause may be identified.[6]

From the *Department of Physical Medicine, Hôtel-Dieu University Hospital, the †Department of Radiology, and the ‡Department of Orthopaedic Surgery, G. Pompidou Hospital, Paris, France.
Acknowledgment date: April 15, 2002. First revision date: July 10, 2002.
Acceptance date: July 23, 2002.
Device status/drug statement: The submitted manuscript does not contain information about medical devices or drugs.
Conflict of interest: No funds were received in support of this work. No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this article.
Address reprint requests to Jean-Yves Maigne, MD, Department of Physical Medicine, Hôtel-Dieu University Hospital, Place du Parvis de Notre-Dame, F-75004 Paris, France. E-mail: jy.maigne@htd.ap-hop-paris.fr.

The following case report describes a typical case of adolescent torticollis with atlantoaxial rotary fixation. The cause of the fixation was established using magnetic resonance (MR) imaging.

Case Report

A 15-year-old male adolescent one morning complained of sudden onset of torticollis. He had not been in pain when waking up. However, when turning his head to get up, he had suddenly felt pain and, shortly after, found himself unable to turn his head or bend his neck to the right.

On presentation 3 hours later, he was found unable to rotate his head past the midline. His head was in a "cock robin" position, with a lateral tilt toward the opposite (left) side and slight flexion of the neck. Bending and rotation toward the right were impossible. There was no ear or upper respiratory tract infection, and no neurologic abnormality was found. When lying on his back, he was in less pain, and could rotate his head slightly better. The spine was tender in the C2–C3 region on the right.

Imaging. The same afternoon MR imaging was performed. A special cervical spine surface coil was used. The slice thickness was 3.5 mm, with an interslice distance of 0.3 mm. Sagittal and coronal T1- and T2-weighted fat-suppressed images were obtained (repetition time [TR], 5000; echo time [TE], 124.6), as were T1-weighted fat-suppressed images after gadolinium injection.

Results. Observation showed that C1 was rotated to the left on C2. This rotary fixation appeared to be secondary to an abnormality of the C2–C3 intervertebral disc. There was an increased signal intensity in the T2-weighted image, against the right uncinate process of C3, suggesting a fluid-containing lesion in the right C2–C3 uncovertebral joint. This lesion appeared to be tense, and was thought to be responsible for the antalgic position, with bending toward the opposite side, at C2 (Figure 1). The C2–C3 disc was of normal height and showed a normal MR signal.

Treatment and Outcome. The patient was treated with analgesic and spasmolytic medications, and advised to lie down for 24 hours. The pain and rotary fixation resolved within a few days. A check MR scan performed 3 weeks after remission of the symptoms was unremarkable (Figure 2).

Discussion

Although computed tomography and radiography can show rotary fixation between C1 and C2, these technics have failed so far to show any causative lesions. Soft tissue entrapment between C1 and C2 has been suggested as a likely cause of torticollis.[3,4]

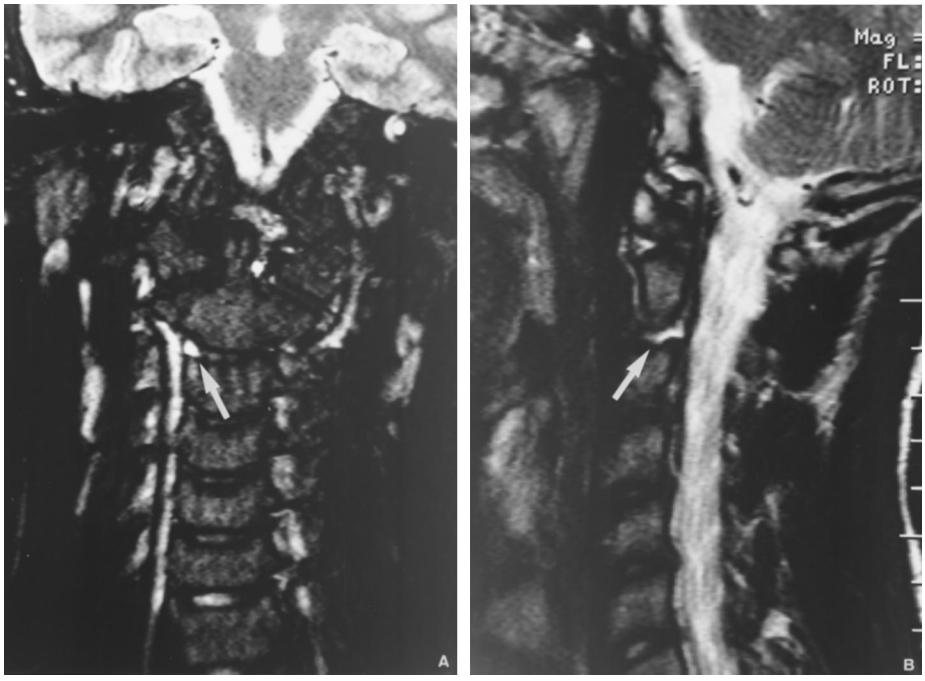

Figure 1. T2-weighted fat-suppressed images. **A,** Coronal image. Note rotation of the atlas and tilt of the axis to the left. At C2–C3, there is a fluid-containing lesion in the right uncovertebral region. **B,** Sagittal image. The lesion is situated against the uncinate process of C3.

In the reported case, it was possible to show both the fixation (although MR was performed with the patient supine, the position in which the muscle spasm is less intense) and the cause of the fixation. The lesion thought to be responsible for the patient's loss of rotation and bending toward the affected side was situated one level further down in the lateral part of the C2–C3 disc against the uncinate process.

Figure 2. Image obtained at a check MR scan at 3 weeks. The abnormalities have disappeared.

Nature of the Lesion

Tondury[7] and Mercer and Bogduk[5] showed, in adults, uncovertebral clefts penetrating medially through the back of the disc. These clefts were, in fact, tears in the collagen fibers of the disc.[5,7] In the study by Tondury,[7] these disruptions did not exist in the fetal spine or in the spines of 6-year-old children. The earliest age at which they were seen was 9 years. In the study by Mercer and Bogduk,[5] the clefts in younger specimens extended only partially into the core, whereas, in older specimens, the clefts totally transected the posterior two thirds of the disc. It would therefore appear that this penetration of the clefts, or disruption of the discal collagen fibers, occurs very slowly as the subject ages, and that the process moves from the periphery toward the center.

We think that in the reported case the collagen fiber disruption occurred suddenly when the patient turned his head, and that the tear was associated with local edema and excessive pressure. The mechanism was that of a sprain, and the patient could be described as having experienced a "disc sprain." The motion segment involved in this case could not have been C1–C2 because there is no intervertebral disc at this level. The observed rotary fixation appears to have been linked to a reflex, antalgic muscle spasm.

The authors cannot tell how often this mechanism is implicated in acute torticollis. They can only note that the reported case was very typical, with onset of the torticollis as the patient was getting up in the morning and after a head-turning movement, loss of rotation and

bending toward the affected side, and rapid resolution of symptoms.

■ Key Points

- In an adolescent with acute torticollis, MR imaging was performed on the day of the traumatic event.
- The images showed atlantoaxial rotary fixation and a fluid collection in the right uncovertebral region at C2–C3 that appeared to be responsible for the rotary fixation and the torticollis.
- The underlying process is thought to have been discal collagen fiber disruption.

References

1. Fielding JW, Hawkins RJ. Atlantoaxial rotatory fixation. J Bone Joint Surg [Am] 1977;59:37–44.
2. Grisel P. Enucléation de l'atlas et torticolis naso-pharyngien. Presse Med 1930;38:50–3.
3. Kawabe N, Hirotani H, Tanaka O. Pathomechanism of atlantoaxial rotatory fixation in children. J Pediatr Orthop 1989;9:569–7.
4. Mercer S, Bogduk N. Intraarticular inclusions of the cervical synovial joints. Br J Rheumatol 1993;32:705–10.
5. Mercer S, Bogduk N. The ligaments and anulus fibrosus of human adult cervical intervertebral discs. Spine 1999;24:619–28.
6. Subach BR, McLaughlin MR, Albright AL, et al. Current management of pediatric atlantoaxial rotatory subluxation. Spine 1998;23:2174–9.
7. Tondury G. Le développement de la colonne vertébrale. Rev Chir Orthop 1953;39:553–68.
8. Wortzman G, Dewar FP. Rotary fixation of the atlantoaxial joint: Rotational atlantoaxial subluxation. Radiology 1968;90:479–87.