Case Report

Atlantoaxial rotatory subluxation presenting as acute torticollis after mild trauma ★,☆,*,★★

Megan R. Greenberg, BS★,*, Jason L. Forgeon, MDα, Lisa M. Kurth, MDβ, Robert D. Barraco, MD MPHγ, Pratik M. Parikh, DOδ

αLehigh Valley Health Network, Department of Emergency and Hospital Medicine/USF Morsani College of Medicine, Cedar Crest Boulevard & I-78, Allentown, PA 18103, USA
βLehigh Valley Health Network, Department of Surgery/USF Morsani College of Medicine, Cedar Crest Boulevard & I-78, Allentown, PA 18103, USA
γLehigh Valley Health Network, Trauma Surgery/Critical Care, Department of Surgery/USF Morsani College of Medicine, Cedar Crest Boulevard & I-78, Allentown, PA 18103, USA

ABSTRACT

Atlantoaxial rotatory subluxation (AARS) is a rare outcome of trauma in adults. We present a case of a 38-year-old female who presented with neck pain and stiffness after a mild trauma. On exam the patient had a “cock-robin” position, comparable to acute torticollis. Computerized tomography demonstrated findings consistent with AARS. Reduction was performed in the emergency department and the patient had no further neurological sequelae. Recognition of AARS after trauma requires a high index of suspicion and early diagnosis is important to best patient outcomes.

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Introduction

Cervical spine injuries occur in 2.4% of blunt traumas [1]. Atlantoaxial rotatory subluxation (AARS) is a rare outcome of trauma in adults [2]. As reported by Rahimizadeh et al in 2010, in the 20th century, there were only 57 adults with reported cases of atlantoaxial rotatory fixation, a term that encompasses rotatory displacement arising from either subluxation or dislocation [2]. In the pediatric population, AARS is more common and can be spontaneous or seen in trauma, particularly with congenital malformation; 1 multicenter cohort showed that of children with blunt trauma related cervical spine injury, AARS accounted for 10% of injuries [3]. In adults, it can lead to a catastrophic outcome with neurological morbidity if the diagnosis is delayed [4].

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* Corresponding author.

E-mail address: greenberg5@usf.edu (M.R. Greenberg).

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The most common presentation of AARS is a “cock-robin” position of the neck followed by a suboccipital headache [5]. This looks like torticollis, with the head tilted to 1 side, rotation to the contralateral side, and decreased range of neck motion [6]. We describe a case of AARS presenting as acute torticollis after mild trauma in a middle-aged female.

A 38-year-old female patient with a history of migraines presented to the emergency department (ED) with a chief complaint of neck pain and stiffness, stating “I can’t turn my head.” Patient reported that 5 days earlier her son reached over and with 2 fingers quickly pulled her chin to her left side. Thereafter, she had severe neck pain. Pain was greater on the right
lateral neck than the left and accompanied by posterior neck pain going “into the skull.” She went to an urgent care center 2 days prior to ED presentation; imaging was not performed but she was prescribed a nonsteroidal antinflammatory drug, muscle relaxant, and steroids for a diagnosis of “neck spasm”; these provided minimal relief. In the ED our patient denied severe headache, vision or hearing changes, speech changes, focal weakness, numbness, or tingling, fever or chills. On physical exam, the patient was afebrile with normal vital signs. She appeared uncomfortable but cooperative, sitting on the bed with her head tilted to the right and her chin rotated to the left (Fig. 1). She had significant painful restriction of her neck. Her trachea was midline, she had no submandibular gland tenderness or swelling, and no hypertonicity of the sternocleidomastoid muscles. Oropharyngeal exam was limited due to pain and mild trismus but the visualized intraoral anatomy was unremarkable. There was mild upper midline cervical tenderness to palpation. She had no focal neurologic deficits on exam. A computed tomography (CT) of her neck with contrast and cervical spine without contrast were ordered with 3D reconstructive views and the patient was given IV Valium for symptomatic relief.

The CT scans demonstrated asymmetry of the odontoid lateral mass interspaces with posterior displacement of C1 on C2 on the left as well as prevertebral soft tissue edema from
C3 to C5 vertebral levels. These findings suggest a lateral axial rotatory subluxation (Figs. 2-4).

Our patient was emergently seen by the trauma team and the senior surgical resident performed a reduction at the bedside; subsequently applying a cervical collar for stability. Neurosurgery was consulted and a magnetic resonance imaging (MRI) was ordered. The MRI demonstrated resolution of the C1/C2 malalignment. There was mild prevertebral soft tissue edema and a small C1–C2 joint effusion. There was no evidence of ligament disruption. (Figs. 5-9)

The patient’s pain improved the day after admission. Neurosurgery recommended no surgical intervention. They advised maintenance of a cervical collar, continuing non-steroidal and muscle relaxant medications, and an office follow-up within 14 days. The patient fortunately did not have any neurologic sequelae from this potentially serious injury from a low mechanism.

Discussion

Recognition of AARS after trauma requires a high index of suspicion, in adults neurologic complications are more common than in children [4]. Prompt diagnosis significantly increases chances for closed reduction to be successful as well as decreases the rate of recurrence [6,7]. CT is the imaging modality of choice to make the diagnosis since radiographs are difficult to interpret due to positioning issues and the complicated anatomy of the atlanto-axial region [8]. However, MRI may provide a better view of the surrounding soft tissue and spinal cord. Additionally, the reported frequency of missed injuries to the cervical spine range from 4% to 30% without imaging [1]. Both CT and MRI may be necessary to arrive at the diagnosis [9]. The CT scan will show a rotated position of the atlas on the axis with or without a simultaneous forward or backward displacement of the atlas [8].

Although usually benign, the presentation of acute torticolis has many other causes apart from AARS including sternoclidomastoid spasm, drug-induced torticolis/dystonia, C1–C2 dislocation, upper respiratory infection/abscess, fracture of the cervical spine or clavicle, injury of a cervical spine ligament or muscle, and spinal epidural hematoma [10]; it is important to keep all of these in the initial differential.

Treatment strategies for a case diagnosed early generally involve a closed reduction and immobilization with a halo-ring or cervical collar. For cases refractory to this treatment, as is common in chronic or recurrent cases with a delayed diagnosis, surgery may be indicated [2,3].

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