

Unstable Cervical Spine Secondary to Ligamentous Injury From a Hyperflexion Injury

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Introduction

Cervical spine injuries are most common among young men and the elderly, with motor vehicle accidents and falls being primary mechanisms of injury. There is a wide range of symptoms and associated pathology one may encounter in the patient presenting after acute cervical trauma. There are several classification systems the advanced practice provider can utilize to help in decision making and direct patient care. Instability following cervical spine injury is of primary concern. When missed, this can lead to a deterioration of neurological function and permanent deficits. The primary goals of treatment are to stabilize the cervical spine and prevent damage to, or prolonged compression of, neurological structures (Khanna & Kwon, 2012; Kwon et al., 2006; Moore et al., 2006; Silva et al., 2016; van Middendorp et al., 2013).

Case Presentation

A 67-year-old woman presented in the outpatient clinic for an emergency department (ED) follow-up, 8 days after a fall with injury to her head and neck. She reported getting out of bed in the middle of the night, stumbling a bit, then falling backward, hitting the back of her head against a nightstand. She described “horrible” neck and posterior head pain at the time. She was able to get back into bed and called 911. She was taken to local ED where she had radiographs and computed tomography of the head and neck, which she had been told were without acute findings. This was later confirmed via report. She was placed in a hard-cervical collar in the ED, with instructions to follow up with her primary care provider, whom she saw 2 days later.

Her primary care provider was concerned about the continued level of severe neck pain and ordered magnetic resonance imaging of the cervical spine (see Figure 1). This was evident for disruption of the posterior longitudinal ligament as well as significant edema about the supraspinous ligament, which was potentially torn, with increased interspinous distance. There was also edema about the anterior longitudinal ligament and noted multilevel degenerative disc disease. She was instructed to continue wearing the hard-cervical collar and to follow up with a spine specialist.

On presentation was an alert, oriented, affect-appropriate female in no apparent distress. She was resting comfortably, breathing unlabored, in a hard-cervical collar. There was no bruising or abrasions about the head or neck. There was diffuse tenderness generally about the posterior neck, which was edematous. Her upper extremity strength, muscle tone, and bulk were grossly equal bilaterally. She noted normal sensation to light touch in all dermatomes. She was able to perform opposition in a coordinated manner and had a negative grip release. She displayed a negative Hoffman's reflex. She had palpable radial pulses with brisk capillary refill.

The patient reported feeling as though “my head is going to fall off” when the cervical collar was removed for examination. With this, we did not perform any further range of motion and sent the patient to radiology for upright cervical radiographs (see Figure 2). These images were evident for instability of the cervical spine, as noted by anterior translation of C5 on C6, with associated widening of the interspinous space.

Management

With noted imaging findings, consistent with cervical instability, the patient was referred to an orthopaedic spine surgeon for definitive management. She was taken to the operating room the next day for anterior cervical discectomy and interbody fusion, followed by posterior instrumentation spanning above and below the affected cervical level (see Figure 3; Khanna & Kwon, 2012; Kwon et al., 2006).

There were no immediate postoperative complications, and the patient was discharged home the following afternoon. At 2-week follow-up visit, pain was markedly reduced, with the patient having weaned off

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FIGURE 1. Sagittal T2-weighted magnetic resonance imaging. The arrow denotes level of disruption of the posterior longitudinal ligament. Also note edema about the anterior longitudinal ligament. Ellipse denotes significant edema invading the interspinous space, with a likely tear of the supraspinous ligament. Note that the overall alignment of the cervical spine is maintained on these supine images. There are no apparent cord signal changes. There is multilevel degenerative disc disease.

all opioid medications. She denied hoarseness or difficulty swallowing. Her surgical wounds were nicely healed. She denied any upper or lower extremity symptoms and was without deficits on follow-up examination.

Discussion

The advanced practice provider's suspicions should be raised when a patient reports significant amounts of ongoing neck pain, with or without feelings of instability in the cervical spine, following trauma. There should be even more immediate concern if the patient reports instability or associated upper or lower extremity symptoms, especially motor weakness. The patient should be stabilized in a hard-cervical collar until full workup, with advanced imaging modalities, can be completed (Khanna & Kwon, 2012; Kwon et al., 2006).

Preferably on presentation, plain radiographs should be taken to assess for overall alignment and evaluate for any gross abnormality. Unfortunately, this is rarely sufficient to completely assess cervical spine pathology in the setting of trauma. Computed tomography is beneficial in assessing for occult fractures, which may easily be missed, given overlapping anatomy and the overall



FIGURE 2. Lateral cervical radiograph. The arrow denotes level of instability, C5–C6. There is evident anterior translation, with associated widening of the interspinous space at this level. Also note multilevel degenerative disease.



FIGURE 3. Postoperative, lateral cervical radiograph. Interval placement of anterior and posterior fusion instrumentation with anatomic alignment restored.

lower sensitivity of plain radiographs. Magnetic resonance imaging is beneficial in evaluating soft-tissue structures, including ligamentous injury, damage to intervertebral discs, with or without associated herniation, and potential cord signal changes that warrant urgent attention. Ultimately, if findings are concerning for an unstable cervical spine injury, urgent referral to an orthopaedic spine surgeon is the most appropriate course of action (Gale et al., 2005; Khanna & Kwon, 2012; Kwon et al., 2006; Lin et al., 2017).

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