Investigations and whiplash

Earlier articles have discussed history and physical examination of the patient with whiplash-associated disorders. This article provides a brief overview of the role of imaging studies.

Given the desire of the patient and the physician for a specific definition of injuries sustained in a whiplash type of neck injury and also the difficulty in isolating a definitive cause of neck pain by physical examination, it is tempting to turn to radiological investigations in an attempt to clarify the situation. Unfortunately, imaging techniques, despite their increasing sophistication, are often not helpful in diagnosis and management. Moreover, they may report findings that have little to do with the neck pain being experienced.[1] Degenerative changes are common in asymptomatic patients, particularly in older individuals. These changes are not well correlated with neck pain or cervicogenic headache.

X-ray, CT, and MRI

The Canadian C-Spine Rule is an algorithm for deciding when to undertake neck X-rays on a patient who is stable and alert (Glasgow Coma Scale 15/15). It was developed by Stiell and colleagues.[2] Their article is helpful and is available in full on the College Library web site. As you can see from the **Figure**,[3] cervical X-rays are not indicated for the patient under age 65 years who is involved in a simple rear-end collision, particularly if there are no red flags such as midline pain, pain that began immediately after the collision, or neurological signs or symptoms. Patients who have one or more red flags and the possibility of a fracture will most likely have their initial presentation to the emergency department rather than to your office.

In my opinion there may be other indications for imaging, for instance the patient with increasing or night pain and pre-existing or coexisting significant risk factors for fracture.

Nordin and colleagues[4] undertook a systematic review of the literature for evidence-based assessment of neck pain. Their research indicated that:

- History and physical screening protocols were most predictive in low-risk individuals.
- MRI findings were not statistically correlated with whiplash injury or neck pain.

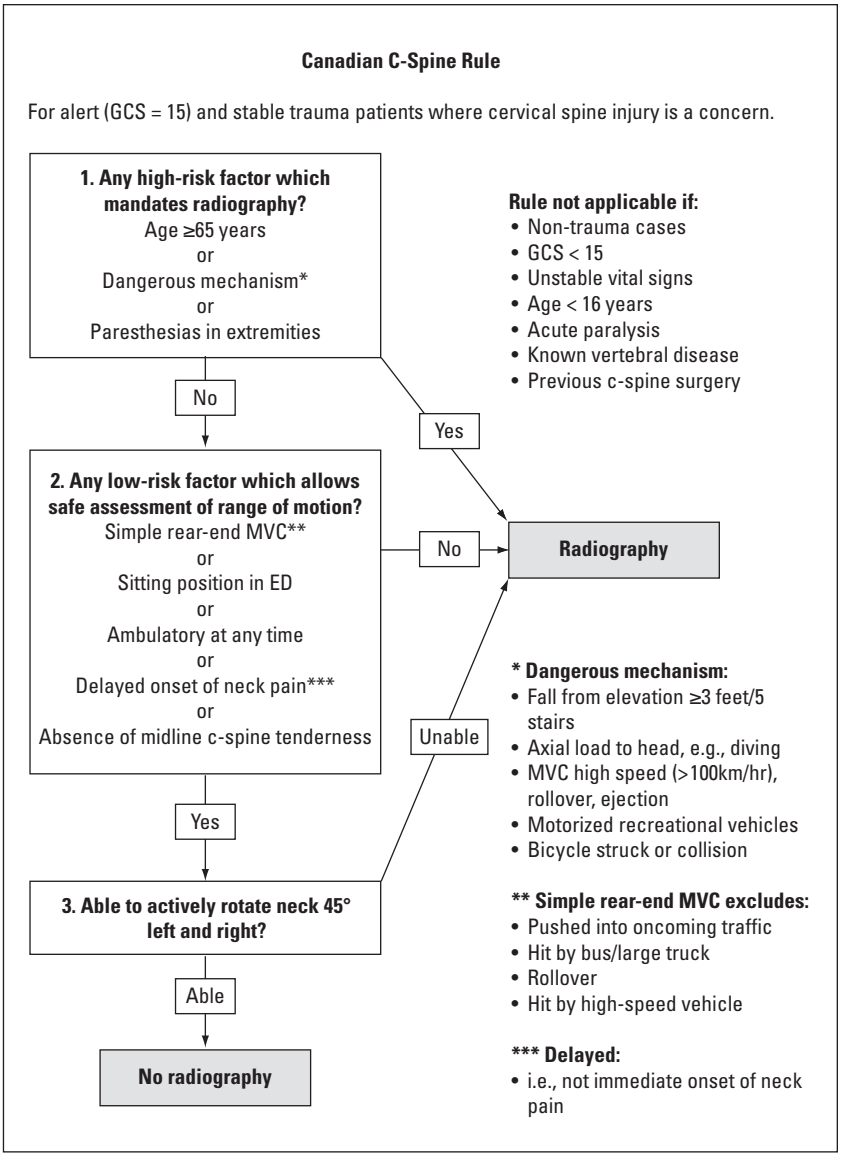

Figure. Canadian C-Spine Rule.[3]

- CT scans had better validity than X-rays for detecting fracture in adults in high-risk and multi-injured blunt neck trauma.

CT scanning may be used, particularly to elucidate bony details, and MRI for delineation of soft tissue lesions. Be aware that a significant proportion of the normal population will show significant morphological changes on imaging that do not correlate with symptoms and do not have a causal relationship with the whiplash injury.[5,6]

Kongsted and colleagues[7] conducted a prospective trial on 178 patients with whiplash-associated disorders (WAD) and no fracture or dislocation as examined by X-ray. The participants received an MRI within 2 weeks of the MVA and again at 3 months. They were evaluated clinically initially and again at 3 and 12 months. MRI findings were found not to be predictive of clinical outcome and not correlated with pain or disability.

A review of the roles of CT and MRI in the evaluation of WAD and the safety issues of these techniques are reported by Bagley.[8] This is a reasonable summary.

I hope this article has given you some helpful information on when to and when not to order imaging studies on a patient with whiplash. If you have suggestions for further articles please submit them to me at Laura.Jensen@ICBC.com.

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college library

Library resources: A focus on Down syndrome

Down syndrome, or trisomy 21, is a common congenital anomaly with an incidence rate of approximately 1 in 800 births across all ethnic groups. In dealing with the needs of patients and families facing this challenge, physicians will find the College library has a number of useful print and online resources. For example, Down syndrome results in an increased risk for several specific health conditions. The textbook *Management of Genetic Syndromes* (2005) provides a useful overview and may be borrowed from the library collection. Approximately 45% of children with Down syndrome will be born with a heart abnormality, which can be corrected before their preschool years. See *Hurst's the Heart* (2008) and *Congenital Heart Disease in Children and Adolescents* in ACP PIER (2008) for details. Both of these texts are available for free online through the College library's web site, www.cpsbc.ca/library.

Children with Down syndrome have a 14-fold increase in the overall rate of acute lymphoblastic leukemia and experience Alzheimer disease three to five times more frequently than the general population. For more, see *Neoplastic Disease* in the online text *Current Diagnosis & Treatment Pediatrics* (2009) or borrow *Adams and Victor's Principles of Neurology* (2005).

For practice guidelines and authoritative patient information, try the College library's search engine on the web site, or visit reliable sites like the Down Syndrome Research Foundation at www.dsrf.org. Remember that for high-quality clinical information to support patient care, the College library is only a phone call or e-mail away.

—Karen MacDonell
—Robert Melrose
—Judy Neill
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