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Article

Sensitivity of plain radiography for pediatric cervical spine injury
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Clinical Question

Do plain film radiographs adequately screen for cervical spine injuries (CSI) in pediatric patients?

Study Type

Concurrent Cohort Study analyzing data collected from the NEXUS cervical spine data

Methods

All data from the 21 hospitals in NEXUS study were analyzed for all patients between age 1 and 19. Then, they analyzed all of those that had a CSI identified. Finally, of those with CSI, any that had plain films performed were studied. In general, it was expected that the cross table lateral, an A-P, and an open mouth odontoid views were collected on these patients.

Results

Of the 3,701 patients in the data set, only 44 had evidence of CSI. Only 32 of those patients had a plain film radiographs; ergo, these were the only ones included in the study. The authors discovered that all these 32 patients with plain films performed, all of the films had an abnormality. The majority of these patients were “older” 9-18 (91%) and male (69%). Finally, the authors are quick to note that while the plain films demonstrated an abnormality, the CT did delineate additional fractures in multiple patients—all of varying clinical significance.

Study Limitations/Issues

There is a potential for verification bias given that patients with a questionable X-Ray were then taken to CT, causing a questionable XR to be read as positive; however, when the authors reviewed follow-up data, no children that had a normal XR were subsequently entered into a neurosurgical or risk management log for a missed clinically significant injury. Of course, a data set of 32 is a relatively small number, partially speaking to how few pediatric blunt trauma patients actually end-up having clinically significant CSI.

Discussion

While there are some minor limitations to this study, I think the data can be used to decrease the potential number of CTs performed on children. In a hemodynamically stable blunt trauma pediatric patient without any neurologic deficit, a quality set of plain film x-rays that do not demonstrate any abnormality, I think it would acceptable to forgo CT. However, if the films are inadequate or there are *any* abnormalities, CT should be pursued. Furthermore, as evidence to support this article, data from PECARN/Pediatric Emergency Care 2012 support that plain films are highly sensitive for identifying C-spine injuries as well.
