

Is there a need for plain film examination in addition to traumaCT?

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"Trauma-CT vs. plain film"

- A retrospective study to investigate the diagnostic yield of plain film examinations of the spine in addition to trauma-CT compared to that of trauma-CT alone...
- "5 points study" a part of the medical school educational program

Patients and Methods

- During 2001-2004, 1492 patients underwent trauma-CT examination at the Uppsala University Hospital.
- Out of these, 104 patients were in addition subjected to plain film radiographic examination [n=206], (of one or several spinal segments).

Siemens Somatom Volume Zoom



4 x 2,5 mm collimation
Pitch 1.5
3 mm reconstruction at
2,5 mm increment
3 mm sagittal reformats at
2 mm increment

Method

- The radiological reports were analysed with respect to spinal fractures and/or dislocation.
- Different types of injuries recorded.
- Analysed with respect to if / if not sagittal multiplanar reformats (MPR) were utilized.
- Sensitivity was related to the total number of findings at both traumaCT and plain film examination.

Results

- 104 patients underwent traumaCT and 206 plain film examinations with a total of 50 findings
- Sensitivity for traumaCT 66%
- Sensitivity for plain film examination 90%

Thoracic & Lumbar spine

Total of 41 findings

CT sens. 58% vs. plain film sens. 98%

- CT without MPR
Sensitivity 50%
- CT with MPR
Sensitivity 77%
- Plain film
Sensitivity 100%
- Plain film
Sensitivity 92%

Thoracic spine

Total of 22 findings

CT sens. 64% vs. plain film sens. 95%

- CT without MPR
Sensitivity 60%
- CT with MPR
Sensitivity 71%
- Plain film
Sensitivity 100%
- Plain film
Sensitivity 86%

Lumbar spine

Total of 19 findings

CT sens. 53% vs. plain film sens. 100%

- CT without MPR
Sensitivity 38%
- CT with MPR
Sensitivity 83%
- Plain film
Sensitivity 100%
- Plain film
Sensitivity 100%

Cervical spine

- Plain film examination of the cervical spine was performed as a complement to traumaCT not including CT of the cervical spine
- Data therefore reported separately

Cervical spine

- 4 x 1 mm collimation
- 1,25 mm reconstruction at 1 mm increment
- 1,5 mm sagittal and coronal reformats at 1 mm increment

Cervical spine

- Total of 9 findings
- CT sensitivity 100%
- Plain film sensitivity 56%
- All examinations included MPR

Differences in the reports

- Of the total of 104 patients that underwent traumaCT examinations (and plain film exams) there was a difference in the reports in 22 patients = 21%
- Of the diverging reports in the thoracic-lumbar region 1 was in favour for CT the other 17 cases was in favour for the plain film examination

This study showed that...

- The diagnostic yield of plain film studies of the thoracic & lumbar spine superseded that of Trauma-CT.
- The sensitivity of Trauma-CT for these injuries increased when MPR was utilized.

Discussion - Material

- Small number of plain film examinations
- Decreasing number of plain film studies over the study period from 107 (2001) to 12 (2004)
- At the same time the traumaCT examinations increased from 313 to 413

Discussion - Type of injury

- The dominating type of injury was compression fracture (16/22), the rest was made up by other types of fractures and dislocations (6).
- Because of the axial orientation of the CT scan it may be harder to spot the compression fracture

Discussion - Experience

Because of equivocal radiology reports by less experienced radiologist re-evaluation of some of the studies by a senior radiologist revealed previously missed injuries

Thank you



(Roentgen's X-ray picture of the hand of Albert von Kölliker, taken 23 January 1896)