International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296

Role of Computed Tomography for Evaluating Spinal Column

Abdulmjeed Al Harbi[1], Ibrahim Alshikh[2], Hassan A Elazeem Gad[3]

[1]University of Hail, Applied Medical Sciences, Saudi Arabia

[2]University of Hail, Applied Medical Sciences, Head of Diagnostic Radiology Department, Saudi Arabia

[3]Alghad International College for Applied Medical Sciences- Tabouk, Diagnostic Radiology Department, Saudi Arabia

Abstract: ***Computed tomography (CT) scans of the Vertebral Column (CT Vertebral Column) have demonstrated a higher level of accuracy than plain films and have been used to assess patients with spinal Lesions when magnetic resonance imaging is not available, radiation exposure remains a serious safety concern.Image reconstruction (IR) decreases the CT radiation dose for diagnostic imaging. However, the feasibility of using IR in CT Vertebral Column is unclear.***

Keywords: CT. Spinal Column. Evaluating

1. Introduction

Computed tomography (CT) of the spine is a diagnostic imaging test used to help diagnose—or rule out—spinal column damage in injured patients. CT scanning is fast, painless, noninvasive and accurate. In emergency cases, it can reveal internal injuries and bleeding quickly enough to help save lives.

Purpose
To evaluate role of low dose ct for evaluating spinal lesions

Study Design
A prospective study.

Patient Sample
All patients from outpatient department of King Salman Hospital (Hail) who suffered from spinal lesions and were referred for CT Vertebral Column.

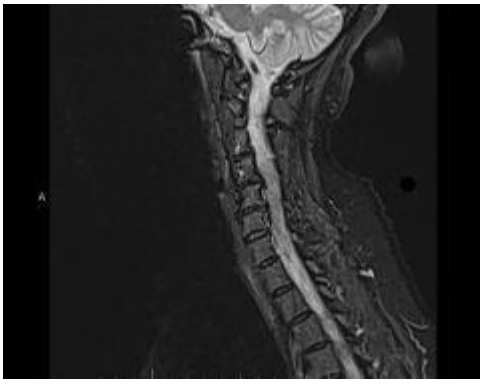
Outcome Measures
In CT images, the dural sac (DS), intervertebral disc (IVD), psoas muscle (PM), and L5 vertebral body, the contrast of the DS and IVD and the subjective imaging qualities were compared across groups

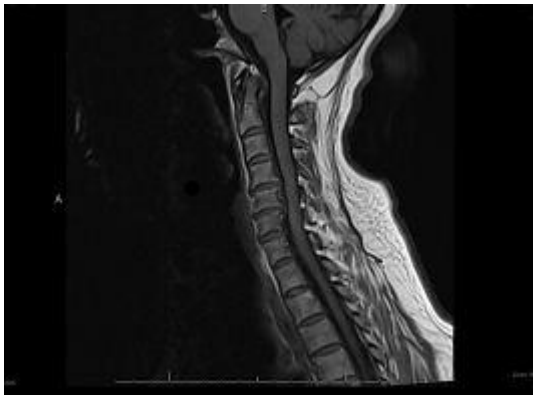
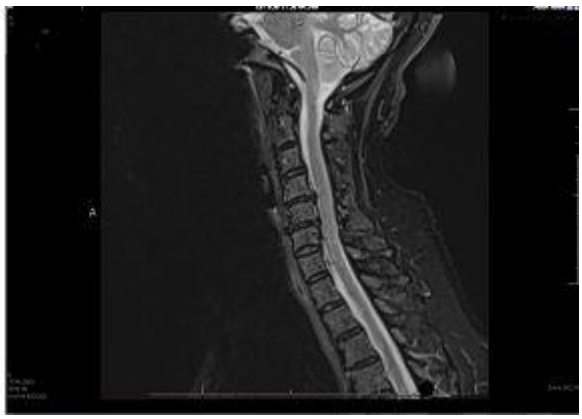
2. Methods

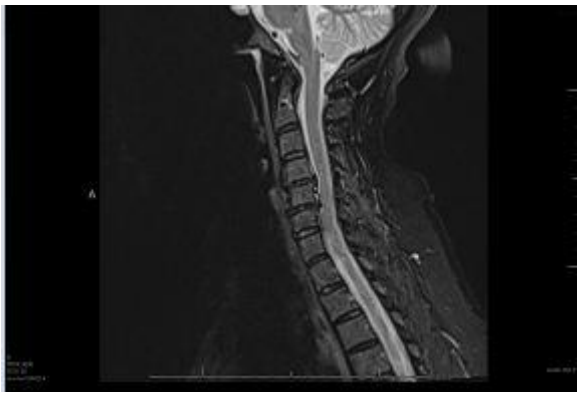
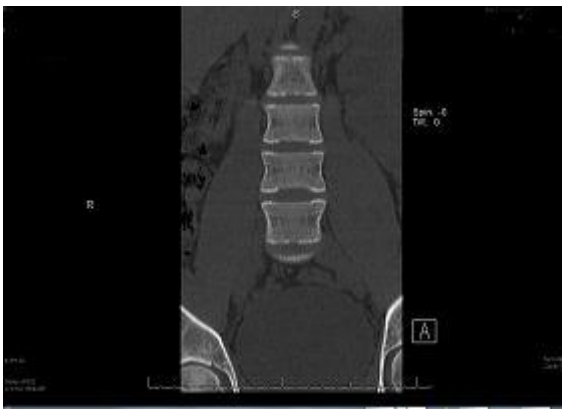
Patients receiving low radiation CT Spine were divided into three groups. A 100mAs tube current with 100 kVp tube voltage was used with Group A and a 200 mAs tube current with 100 kVp tube voltage with Group B. Intended end radiation exposure was 60% less than that of the control group. Tube modulation was active for all groups. The images of the two low-radiation groups were reconstructed by Workstation

3. Results

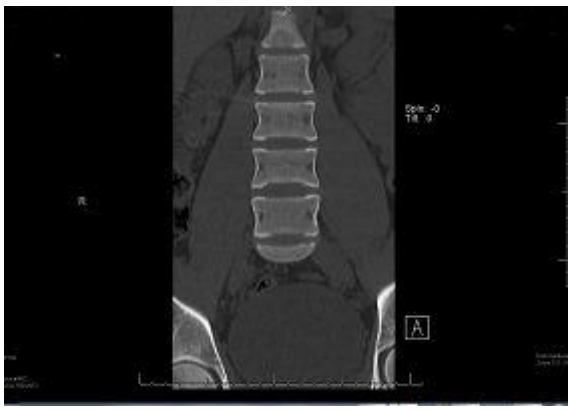
The the control group. All IR for Group B were inferior to those of the control group. Except for that of the facet joint, all subjective imaging ratings for anatomic regions were equivalent between Groups A and B. was highest for the control group (0.80-0.90), followed by Group A (0.70-0.80) and B (0.60-0.90).

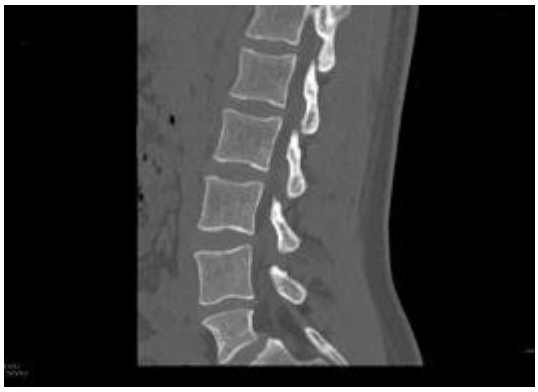



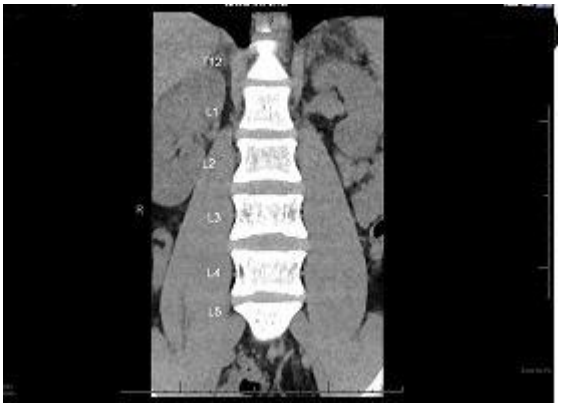











4. Conclusions

The whole spine will probably become the first screening tool in place of standard radiography for patients who require imaging after trauma, especially in the patients at high risk and in unconscious patients. This leads to a significantly higher radiation dose in those patients, of whom most are young patients who will have negative findings. Our study shows that, in modern MDCT, the use of tube current modulation and lower tube voltage settings can significantly reduce this radiation dose, compared with standard dose with fixed tube current, thereby preserving adequate image quality for the detection of spine fractures.

Sixty percent tube current reduction combined with IR provides the same Image accuracy and Increase patient safety when compared with Plain CT Spine. Our results support its use as a screening tool. With the Changing factor technique, further adjustments in IR based on body weight become unnecessary.

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Author Profile

Abdulmjeed Mohammed Al Harbi, University of Hail, Applied Medical Sciences, Saudi Arabia

Ibrahim Abdalla MAlshikh, Head of Diagnostic Radiology Department, Deputy Vice-Dean of the Quality, Development, and community service. Assistant Prof of Diagnostic Radiology, Applied Medical Sciences .University of Hail, P.O Box 2440, Hail, Saudi Arabia

Hassan A Elazeem Gad, Assistant professor, Alghad International College for Applied Medical Sciences- Tabouk, Diagnostic Radiology Department, Saudi Arabia