



ORIGINAL RESEARCH PAPER

Radiology

ROLE OF MDCT IN EVALUATION OF CERVICAL SPINE IN CASES OF TRAUMA

KEY WORDS: Road traffic accidents(RTA), Fracture ,cervical spine, MDCT, Trauma.

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ABSTRACT

INTRODUCTION: The overall prevalence of cervical spine injury among all trauma patients was 3.7% .1 When cervical spine injury is suspected, there has been shift from radiography to MDCT,which provides faster and more accurate evaluation of spine.

AIMS: 1.To detect incidence of cervical spine injuries in cases of trauma using MDCT.

2.To assess role of CT scan in determination of fracture types and severity of cervical spine injury

MATERIALS AND METHODS: Imaging studies of 30 patients between 18 to 80 years came to department of Radiodiagnosis at MGM, Navi Mumbai was done using 64 slice Toshiba Aquilion CT machine during September 2016 to February 2017.

RESULTS :Of the 30 patients 21 patients were detected with cervical spine injuries . The commonest cause was RTA.

CONCLUSION: MDCT is emerging as an accurate, rapid, diagnostic modality in the initial evaluation of patients of cervical trauma.

INTRODUCTION

Cervical spine injury is a common problem with a range of severity from minor ligamentous injury to frank osteoligamentary instability with spinal cord injury.Plain radiography which included lateral, AP and odontoid views were considered the standard of care for initial trauma evaluation.But they provided poor visualization of the cranio cervical and cervico thoracic junction and resulted in missed injury rates of 15-30% in some studies.²The advent of MDCT has supplanted the use of plain radiography. Recent literature supports CT as more sensitive with lower rates of missed primary and secondary injury.³

MATERIALS AND METHODS:

SOURCE OF DATA: Patients with cervical spine injury referred to the department of Radiodiagnosis, MGM Institute of Medical Sciences,for diagnosis and evaluation who were subjected to 64 slice MDCT

SAMPLE SIZE: 30

METHOD OF COLLECTION OF DATA: A cross sectional study was performed. It included patients of cervical trauma between the age group of 18-80 years of both the sexes referred to department of Radiodiagnosis,MGM.

INCLUSION CRITERIA

All the patients with cervical trauma between the age group of 18-80 years referred to MDCT scan

EXCLUSION CRITERIA

1. Patients referred for imaging of cervical spine with causes other than trauma
2. Patients below the age of 18 and above the age of 80 years.
3. Pregnant women
4. Patients not willing to be part of the study

PROTOCOL

The technique involves scanning the entire cervical spine without administration of contrast media by using automatic exposure control on a 64-sliceToshiba Aquilion MDCT scanner . We use 1mm axial section thickness at 1mm interval with coronal and sagittal reconstructions.

RESULTS

Of the 30 patients 19 were male patients and 11 were female patients. Majority of patients were of age group 21- 45 years and the main etiology was road traffic accidents followed by falling from height. While falling from standing or seated heights was more common in elderly patients above the age of 60 years. Out of 30 patients abnormal findings were detected in 21 patients.

TABLE 1 SUMMARY OF CT FINDINGS

CT FINDINGS	No. of cases	Percentage of cases
Fracture of odontoid process	2	6.6%
Fracture of C1 vertebrae(Jefferson's fracture)	1	3.3%
Anterior small tear drop fracture(extension injury)	7	23.3%
Anterior big tear drop fracture(flexion injury)	2	6.6%
Clay shoveler fracture(fracture ofC6,C7 spinous processes)	1	3.3%
Interlocking of facetal joints(rotational injury)	4	13.3%
Wedge compression fracture	1	3.3%
Fracture of vertebral body	4	13.3%
Fracture of posterior elements	9	30%
Associated with spinal cord injury	1	3.3%
Associated with spinal canal stenosis	2	6.6%
Associated with ligament injury	1	3.3%
Normal	9	30%

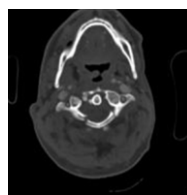


Figure 1 Bilateral Jeffersons fracture(C1)

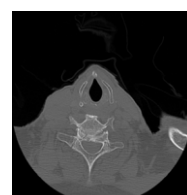


Figure 2 Fracture of body extending into Transverse process(C6)



Figure 3 Anterior tear drop fracture of C2

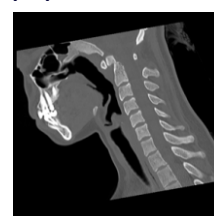


Figure 4 High odontoid fracture

DISCUSSION

The common type of injury was fracture of posterior elements detected in 30% of patients followed by anterior small tear drop avulsion fractures occurring in hyperextension of spine due to sudden deceleration in motor vehicle accidents. Interlocking of facet joints were seen in 13.3% due to rotational injuries. Most cervical spine fractures occurred predominantly at two levels. Majority occurring at level of C6, C7 levels followed by C2. Two patients had odontoid fracture. Of which 1 was Anderson and D'Alonzo type 1 involving tip of odontoid process and other one had type 2 involving the base of odontoid process with atlanto-axial dislocation.⁴ One patient had bilateral Jefferson's fracture.⁵ These fractures were caused due to shearing forces. These fractures involving atlanto axial complex commonly occur in elderly patients. Predominance of degenerative changes in lower cervical spine makes upper spine more mobile explaining high proportion of injuries in this segment in elderly.⁶

Spinal canal stenosis was noted in 2 patients due to encroachment of bony elements. In one patient the findings were associated with spinal cord injury seen as hyperdensity within the cord suggestive of haemorrhage. Anterior longitudinal ligament injury was detected in one patient. However spinal cord and ligament injuries are better evaluated on MRI.

CONCLUSION

MDCT is a standalone screening test for excluding cervical injuries in patients with obtundation. MDCT is a fast way of imaging without moving the patient resulting in high definition axial, coronal, and sagittal images which depict fractures and dislocations clearly.

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