

A Third Cervical Vertebra Fracture

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Abstract: 28 years old patient presented in Road Traffic Accident (RTA), complaining of loss of consciousness, x-ray was done showed fracture of third cervical vertebra with forward displacement of the upper fragment. After that CT was done and showed fracture of third cervical vertebra with forward displacement of the upper fragment and compression to the spinal cord posteriorly.

Keywords: CT, C3, RTA, 3D.

INTRODUCTION

Fractures of the third cervical (C3) vertebrae are uncommon. But it results in higher mortality rate than other cervical fractures. The phrenic nerve can be damaged in a C3 fracture and subsequently diaphragm can get paralyzed, which may be the cause for higher mortality. As below C3, the vertebral canal becomes narrower in comparison to the diameter of the spinal cord itself. Thus, spinal cord injuries occur more commonly in cervical fractures in this region [1].

X-ray

A neck X-ray (or cervical spine X-ray) is an X-ray image of the cervical vertebrae. It also shows the image of the surrounding structures, including the vocal cords, tonsils, adenoids, trachea windpipe, and epiglottis [2].

CT

X-ray computed tomography (x-ray CT) is a technology that uses computer-process x-rays to produce tomographic images (virtual 'slices') of specific areas of the scanned object, allow the user to see inside without cutting.

Digital geometry processing is used for the generation of a three-dimensional image of the inside of an object from a number of two-dimensional radiographic images taken around a single axis of rotation [3, 4]. The most common application of x-ray and CT is medical imagings that

are used for the diagnostic and therapeutic purposes [4, 5]. It helps in demonstration of various bodily structures based on their ability to block the x-ray beam [4, 6].

CASE REPORT

28 years old patient presented in Road Traffic Accident (RTA), complaining of loss of consciousness, x-ray was done showed fracture of cervical vertebra 3 with forward displacement of the upper fragment (Fig. 1). After that CT was done and showed fracture of cervical vertebra 3 with forward displacement of the upper fragment and compression to the spinal cord posteriorly (Fig. 2).



Fig. 1: Lateral cervical spine x-ray shows fracture C3



Fig. 2: Sagittal cervical spine CT bony window shows fracture C3



Fig. 3: Cervical spine CT 3D shows fracture C3

DISCUSSION

The National Emergency X-Radiography Utilization Study (NEXUS) criteria [7, 8] or the Canadian C-spine rule is [9, 10] widely used for the initial evaluation of the cervical spine following trauma.

NEXUS criteria were reported sensitivity, specificity and negative predictive value of 99.6%, 12.9% and 99.9% respectively for cervical spine injury. While Canadian C-spine rule was reported as 100% sensitive and 42.5% specific to clinically important injury, negative predictive value not reported [11].

The rapid technological advancements in computed tomography (CT) have resulted in vastly improved imaging quality and reduction in artifact when compared to plain X-ray [12]. Several authors have reported increased sensitivity by using CT imaging as an adjunct to plain radiography in order to visualize the craniocervical and cervicothoracic

junctions, or areas suspicious for injury on plain films [13-15].

A portable cross-table lateral radiograph in the emergency department is frequently inadequate and needs to be abandoned, as it is often insufficient, needs several repeats, and often cannot exclude a fracture. Adequate views in the Radiology Department is necessary in order evaluate the patient with radiography. The patient's neck should remain immobilized until a full cervical spine series can be obtained, although initial films may be taken through the cervical collar. Common reason for a missed cervical spine injury is technically inadequate cervical spine radiographic series [16].

CT scanning is the most efficient technique for detecting as well as formally eliminating an injury. MRI is indicated in patients with a neurologic deficit. MRI is indicated in symptomatic patients with normal

radiographs when a bone bruise is suspected and for ligamentous injuries [12, 17-19].

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