

INCIDENCE, PATTERN & CHARACTERISATION OF MANDIBULAR FRACTURES IN ROAD TRAFFIC ACCIDENT BY MULTIDETECTOR COMPUTED TOMOGRAPHY

Radio-Diagnosis

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KEYWORDS

INTRODUCTION

- The rapid increase of motorisation in the society has led to an exponential increase in maxillo-facial injuries and facial injuries are one of the common causes of emergency admissions.
- The mandible is the most common site of facial fractures after the nasal bones.
- The most common cause of mandibular fractures in India is road traffic accidents (40–42%), other causes being due to falls, assaults, sports, and work injuries.
- Mandibular fractures are more often multifocal than unifocal.
- The most common site of fracture in mandible are condyle of the mandible followed by symphysis / para symphysis & horizontal branch/ body was fractured in our study.
- CT has supplanted plain-film panoramic radiography as the first-line examination because of its availability in trauma settings.
- Direction of the impact & the mode of injury are important determinants of location and patterns of these injuries.

Classification Of Mandibular Fracture

Symphysis/ parasymphysis (15%)

Horizontal branch/body (25%)

Angle (25%)

Ramus (3%)

Condyle (30%)

Coronoid process (2%)

Aims And Objective

Aim:

- To evaluate pattern & characterization of traumatic mandibular fractures on multidetector computed tomography

Objectives:

- To identify the exact location and number of fractures in mandible.
- To represent the significant status of distribution of fracture according to age & gender
- To describe the diagnostic importance of CT 3D face for the evaluation of mandible fracture.

MATERIAL AND METHODS:

- The study was carried out in the Department of Radiodiagnosis Rajshree Medical Research Institute Bareilly, Uttar Pradesh after the approval of proposal by subject committee and Ethical Committee.
- It was a hospital based cross sectional study done for a period of one year from 2022 to 2023 in 80 patients with facial injuries using GE revolution 16 slice CT scanner.
- Patients were evaluated regarding patient age, gender and type of injury in road traffic accident.
- Relevant history of each patient was recorded and all the patients underwent routine clinical examination for swelling of face, ecchymosis, deformity of face, tenderness, abnormal mobility, step defect at the fracture site, disturbance of occlusion, loss of function, bleeding from mouth, nose or ear.
- MDCT with volumetric acquisition was done in axial planes from upper border of frontal sinus to chin using standard CT protocol.
- From axial images thin sections through in-built software were made multiplanar reconstructions (MPR) in coronal and sagittal

planes along with 3D reconstruction.

RESULTS:

- A total of 80 patients with fracture of mandible were studied on the basis of a predefined inclusion and exclusion criteria.
- Out of these 80 patients there were 60 (75%) males and 20(25%) were females.

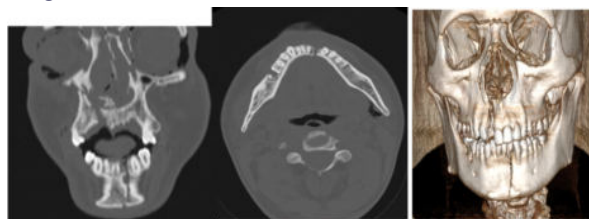
Table1: -Represent of Frequency distribution of symphysis/ Para symphysis, horizontal branch/ body of finding according to Gender wise in our study.

Finding		SEX		Total N=80(%)	P- Value
		Female N=20(%)	Male N=60(%)		
Finding	Angle	0(0)	8(100)	8(100)	0.53
	Ramus	4(50)	4(50)	8(100)	0.44
	Condyle	12(30)	28(70)	40(100)	0.5
	Coronoid process	0(0)	4(100)	4(100)	0.75
symphysis/ Para symphysis		4(12.5)	28(87.5)	32(100)	0.307
horizontal branch/ body		1(12.5)	7(87.5)	8(100)	0.29

Table 2: - Represent of Frequency distribution of symphysis/ Para symphysis, horizontal branch/ body of finding according to Age interval wise in our study.

Finding		Age Interval			P- Value
		≤20 Year N=32(%)	21-40 Year N=32(%)	>40 Year N=16(%)	
Finding	Angle	4(50)	4(50)	0(0)	0.75
	Ramus	4(50)	4(50)	0(0)	0.75
	Condyle	8(20)	20(50)	12(30)	0.147
	Coronoid process	0(0)	4(100)	0(0)	0.45
	symphysis/ Para symphysis	16(50)	12(37.5)	4(12.5)	0.51
	horizontal branch/ body	16(50)	12(37.5)	4(12.5)	0.69
Gender	Male	4(20)	8(40)	8(40)	0.368
	Female	28(46.7)	24(40)	8(13.3)	

Images:



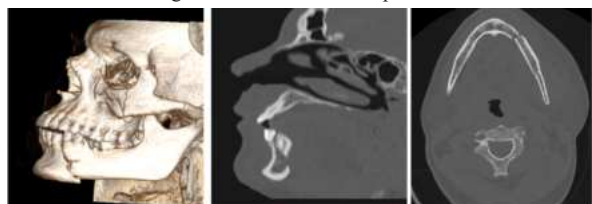
24 Years Male Presented With History Of Rta 30 Mins Ago, Bleeding From Nose & Mouth Present.

Linear Undisplaced Fracture Left Parasymphysis Region



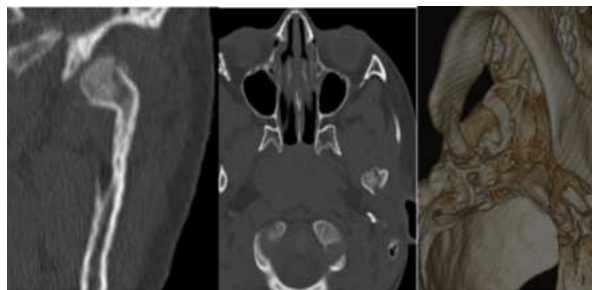
22 Years, Male, Presented With Rta, Injury To Face & Left Ear Bleed Present.

Fracture Of Left Angle Of Mandible With Step Fracture Defect



58 Years, Male Presented With Alleged H/o Rta & H/o Alcohol Consumption Is Present.

Left Parasymphysis Fracture With Step Fracture Defect



22 Years, Female, Presented With Rta, Injury To Face & Left Ear Bleed Present.

DISCUSSION:

This study was undertaken to review the commonest site, and combination of mandibular fracture sites; to study correlation of site of fracture with etiology; to study correlation of number of fracture sites in mandible with age, sex, and RTA.

The incidence of mandibular fracture in this study increased from less than 20 to 40 years then progressively decreased from 40 years of age. Subodh S. Natu et al also showed maximum number of subjects were in the age group 21–30 years (28.8%) followed by 11–20 (25.8%), 31–40 (21.2%), <10 (13.6%), 41–50 (6.1%), and 60 years and above (4.5%). Around three-fourth (75.76%) of patients were in the age range 11 to 40 years and decreased onward.

In present study the most common site of fracture was condyle followed equally by The symphysis /parasymphysis and horizontal branch/body of the mandible. Motamedi et al., Ahmed et al., and Brasileiro and Passeri also stated condyle as the most commonest site of fracture.

In this study also males were affected predominantly with Male: Female ratio was found to be 4:1. Similar male preponderance in cases of mandibular fractures have also been reported by the authors such as Srinivas MR et al (M:F, 83:15)6 and Kiran Kumar N et al (Male: Female; 18:2).

In this study was found most common affected age group was between 20–40 years. Ildirgan K et al and Natu Set al also reported the mean age of patients with mandibular fractures to be 38.6 and 34.1 years respectively.

CT is becoming the modality of choice for imaging the facial bones, but diagnostic radiographs of the mandible still are ordered commonly enough that technologists need to keep their skills sharp. MDCT can detect the non-displaced fractures and also provides valuable 3D morphology of the more complex injuries in facial trauma.

Despite a higher radiation dosage compared to radiography, in craniomaxillofacial injuries, CT is the imaging technique of choice to display the multiplicity of fragments, the rotation and dislocation degree, or any skull base involvement Escott et al. showed that CT was more sensitive than panoramic tomography, particularly for fractures of the angle, ramus, or condyle.

CONCLUSION:

The following conclusions have been drawn from the foregoing study: Road traffic accidents were the most common cause of fracture mandible and mandibular fractures were more common in males than females with the highest percentage in 21–40 years of age. In majority of the instances condyle of the mandible followed by symphysis / para symphysis & horizontal branch / body was fractured in our study.

MDCT imaging of the mandible, also demonstrated the benefit of a 3D reconstructed view, that allows the classification and severity of the fracture to be evaluated due to the spatial information it provides. The characteristic MDCT findings, especially the prevalence of location, of mandibular fractures resulting from road traffic accidents are useful for the appropriate treatment in patients with mandibular fracture.

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