

CASE OF THE WEEK



BILATERAL MULTIPLE RIB FIXATION IN CASE OF SEVERE BILATERAL CHEST TRAUMA

AT APOLLO HOSPITALS, GANDHINAGAR

Chest wall trauma is common worldwide. The majority of cases are a result of blunt mechanisms. Among these injuries, rib fractures are considered the most frequent type of clinically significant blunt thoracic trauma sequelae and are associated with considerable morbidity and mortality. Over last decade, a substantial advancement in materials (e.g., low profile titanium plates) and technologies (e.g., angle-stable locking screws) has proved Rib fixation much beneficial over conservative management .

CASE REPORT

A 45 year old man came to emergency department with history of road traffic accident 6 days ago with complain of bilateral chest pain and difficulty breathing. Patient was pedestrian when a 4 wheeler rolled over him. He was treated at nearby hospital in I.C.U where he was treated conservatively with analgesics and supportive care. Patient underwent CT Thorax which showed multiple displaced rib fractures on both sides with subcutaneous emphysema on left and mild hemothorax with pulmonary contusion. Patient was shifted to Apollo Hospitals for further management with increasing respiratory distress.

He was tachycardiac , tachypneic but maintaining saturation of 98% on 12 litres/min of oxygen through NRBM mask on arrival to ER. On examination, Bilateral Air entry was decreased with paradoxical chest movement on right side. In ER, bilateral ICD insertion was done in 5th intercostal space in mid axillary line. About 500 ml hemorrhagic output in left ICD bag and 250 ml in right ICD bag was seen. Patient was managed with IV antibiotics and multimodal analgesia in ICU.

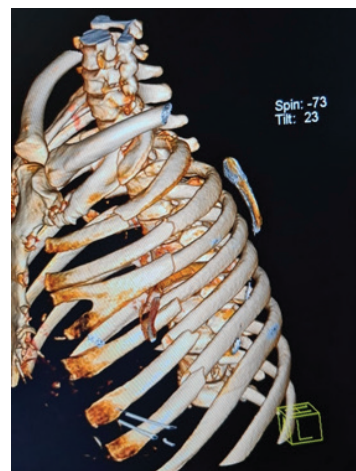
CT thorax plain was repeated showing left 1st to 7th rib fractures and right 1st to 9th rib fractures with pulmonary contusion and bilateral ICD in situ. Three PCVs given. For increasing respiratory distress , patient was put on Bipap support. Patient and relatives were counseled for Bilateral Rib fixation and its advantages. He was operated for bilateral multiple rib fixation with 8 hole plate (2.5 mm) and 6 titanium screws (10 mm) on right 5th and 6th ribs and left 5th , 6th and 7th ribs fracture. Patient was transferred to ICU and kept on mechanical ventilation for only 24 hours postoperatively and then extubated. He was maintaining saturation on 4L/min oxygen by nasal prong and he was mobilized with both ICD in situ after 48 hours postop. Right ICD removed after 3 days and Left ICD was removed after 4 days postoperatively. He was doing Incentive spirometry exercises upto 2 balls and off oxygen from 4th day postop. Patient improved significantly (preop pain score was 9/10 and on 5th POD, it was 3/10) and was discharged on 7th postoperative day with independent walking and mobilization without any infective sequelae.



F.1 Multiple rib fractures with bilateral hemothorax & surgical emphysema before ICD insertion.



F.2 3D CT Thorax showing fractures of Rib 1 to 9th on Right side.



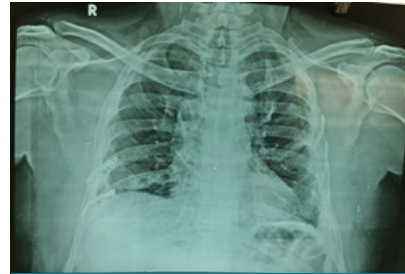
F.3 3D CT Thorax showing fractures of rib from 1st to 7th on Left side.



F.4 Intra-op image of right 5th and 6th rib fixation.



F.5 Intra-op image of left 5th, 6th and 7th rib fixation.



F.6 Post-op chest x-ray with bilateral rib fixation with implants in situ.

DISCUSSION

Multiple rib fractures are one of the most common cause of death in trauma patients. Most patients do not undergo rib fixation and are managed conservatively. Presence of bilateral fractures and concomitant lung parenchymal injuries were associated with increased risk of chest-related death in a cohort of 1495 patients. Among another cohort of 1490 patients with blunt chest trauma, mortality was associated with presence of flail chest in addition to number of fractures. Flail chest alone is associated with mortality of 16–17%. Mortality risk increased to 42% when pulmonary contusion was present in addition to flail. Surgical rib fixation study done by Leinecke et al showed a 57% decrease in mortality, 55% lower risk of pneumonia and 75% lower risk of tracheostomy. while nearly same results were found in Slobogean study as well. Both this studies also showed the decreased ventilator duration, decreased ICU stay and decreased hospital stay with surgery. 84 % patient post-surgical rib fixation were found to have no pain after 4 to 8 weeks of surgery.

In a 16-month follow up survey, Majercik et al found that - 33 of 36 (92%) patients returned to work at the same job that they did preinjury while the mean time to get back to full-time work was 7.9 ± 1.0 weeks. This case is an example for requirement of rib fixation. Most patients undergo unilateral rib fixation. But in this case patient had multiple bilateral rib fractures causing paradoxical movement of chest with respiratory distress and hence underwent bilateral rib fixation. The ribs that were more unstable were used for fixation and thus rib 5th and 6th on right side and 5th, 6th and 7th on left were fixed. Compared with conservative treatment, surgical treatment resulted in shorter length of hospital stay, decreased length of ICU stay, decrease duration of ventilation and lower risk of complication of pneumonia. In our case, bilateral multiple rib fixation resulted in faster recovery, low pain score, no infective complications and better prognosis than conservative management.

Dr Sanjay Shah

Sr. Consultant Trauma Surgeon & Head, Emergency Department



Plot No. 1-A, Bhat, GIDC Estate, Airport Gandhinagar Road, Gandhinagar-382428
Phone : 079 66701880 / 76988 15003