

Rib Plating Outcomes in Elderly Trauma Patients with Multiple Rib Fractures: A Community Hospital Experience

T. Wasfie, MD FACS, M. Sowa DO, H. White, MD, S. Nesheiwat OMS-IV, MS, J. Hille RN, J. Hella MPH, K.Barber PhD, B.Shapiro MD FACS

Background:

Rib fractures are commonly acquired during blunt force trauma to the chest wall. These are typically managed via pain control and oxygen support. More recent support has been given for surgical rib fixation, ie. plating. Rib plating has been shown to be most beneficial among certain populations, such as patients with flail chest, pain refractory to conservative measures, chest wall deformities, and failure to wean from the ventilator in patients without primary pulmonary pathology.

Methods:

The medical records of 253 consecutive patients presented to the trauma department at our community hospital with accredited level II trauma, with rib fractures were analyzed from January 2015 to December 2021. Data and variables collected included age, sex, comorbid conditions, anticoagulant therapy, length of stay in both the hospital and ICU, surgical intervention including rib plating, analgesia used, GCS and ICS and mortality. These patients were divided into 2 groups. Group I consisted of patients who received open reduction and fixation of the fractured ribs, and Group II was patients managed conservatively without surgery. Statistical analyses were used to detect significance at ≤ 0.05 using Student's t-test and Chi-square test. Institutional Review Board approval was obtained for this study.

Results:

A total of 253 patients were seen with rib fractures, 9 patients had to be eliminated because of incomplete data. Of the remaining 244 patients, 63% were male and 37% were female. The mean age is 64 ± 18.5 years. Of these patients analyzed, 76% had an associated comorbid condition, such as Diabetes Mellitus (DM), Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Chronic Kidney Disease (CKD) or any combination of the above. Of those patients, 111 (46%) were on anticoagulant therapy. The majority of patients (95%) presented to the emergency department (ED) with Mild GCS range (13-15). Moderate GCS range (9-12) was 4% and 3% of patients were Severe GCS (3-8.) The mean ISS was 10. The overall mortality rate was 4.5%. The differences between the variables of the two groups are summarized in Table 1.

	Group I Surgical n=36	Group II Non-Surgical n=208	p- value
Congestive Heart Failure	23%	8%	0.007
Chronic Obstructive Pulmonary Disease	25%	9%	0.004
Chronic Kidney Disease	11%	2%	0.01
GCS of Moderate Severity	8.3%	0.5%	0.003
ISS	14	10	0.001
Length of Stay (days)	11	5	0.0001
Mortality	0%	5.3%	0.1
Mode of Injury:			
Motor Vehicle Accident	33%	28%	no significance
Blunt Trauma (fall)	64%	66%	
Penetrating Trauma	3%	6%	

Table (1)- the variable's difference between Group I (rib plating group) and Group II (conservative treatment) of patients seen with rib fractures

Discussion:

The geriatric population, with their statistically higher rate of osteoporotic fragility fractures and comorbidities, remains the most desirable group of patients to use the surgical approach to rib plating for. This is due to the procedure's ability to reduce morbidity and mortality by increasing the early mobility of trauma patients. Since early mobility is the prime target for any trauma patient to reduce complications and improve outcomes, rib stabilization combined with early mobility and physiotherapy undoubtedly will result in better results. When considering our experience in rib plating in the elderly patient, the early data showed mortality rate is significantly improved, despite the fact that these patients had higher rates of comorbidities, however, the tradeoff, not surprisingly is a longer length of stay in both the hospital and in the ICU settings.

Conclusion:

Rib plating in elderly trauma patients with multiple rib fractures has shown to be beneficial in terms of mortality. Furthermore, geriatric patients with comorbidities will benefit from early open reduction and fixation of rib fractures, though a larger study is needed to establish clearer criteria for rib plating.

References

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