Management of Cardiac Injuries: A Single Center 10 Year Experience

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INTRODUCTION/OBJECTIVES

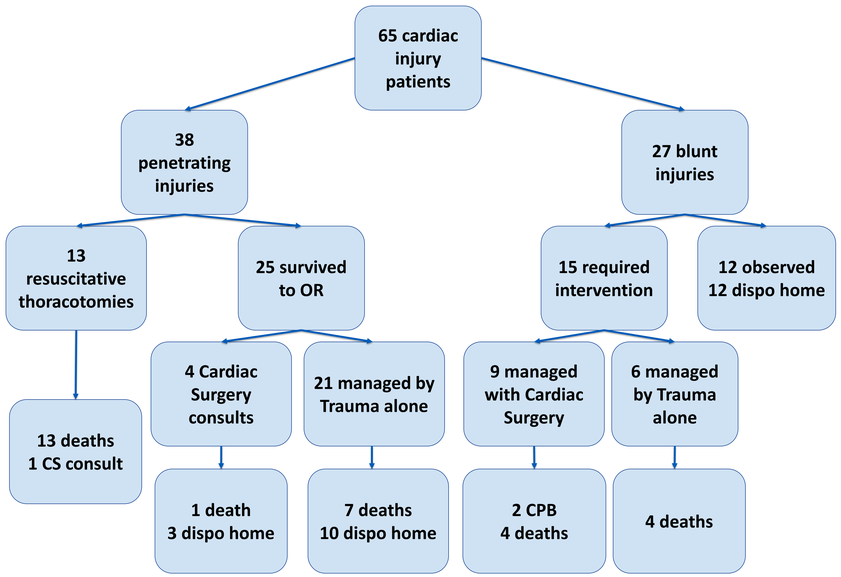
Cardiac injury is an uncommon diagnosis in the trauma bay, partly because many cardiac injury patients die in the field. When patients do present to the trauma bay, they often arrive in extremis. No one algorithm has been suggested for the management of cardiac injuries. Specifically, the assistance of Cardiac Surgery has been suggested to improve outcomes in complex cases, but this has never been studied outside of single case reviews.

This study sought to evaluate how often Cardiac Surgery was consulted for severe cardiac injuries at our institution. We also explored the outcomes of those patients managed with Cardiac Surgery assistance versus those managed by Trauma Surgery alone.

METHODS

- Retrospective chart review using the Trauma Registry
- All adult penetrating and blunt cardiac injury patients between 1/1/2009 and 12/31/2019 were included
- Iatrogenic injuries and isolated injuries to the great vessels were excluded
- Primary outcome: in-hospital mortality
- Secondary outcomes: time to intervention, ICU and hospital LOS, and discharge disposition
- Patient characteristics, location of injury, operative approach, type of repair, and any 30-day complications were also analyzed
- Statistics included Fisher's exact test and odds ratios with a 95% confidence interval

RESULTS



Columns by: Operative Management	Trauma Surgeon	Trauma + Cardiac Surgeon	P-value	Odds Ratio (95%CI)
n (%)	33 (86.8)	5 (13.2)		
*** Outcomes	***	***	***	
Length of hospital stay, mean (sd)	5.0 (7.7)	5.8 (4.9)	0.82	
Length of ICU stay, mean (sd)	3.1 (6.8)	2.5 (1.7)	0.86	
Death, n (%)				
No, n (%)	14 (42.4)	3 (60.0)		
Yes, n (%)	19 (57.6)	2 (40.0)	0.46	0.49 (0.09-2.9)
Patient discharge disposition, n (%)				
Death, n (%)	19 (57.6)	2 (40.0)		
Discharge to home, n (%)	10 (30.3)	2 (40.0)		
Discharge to rehab, n (%)	2 (6.1)	0 (0.0)		
Other, n (%)	2 (6.1)	1 (20.0)	0.63	
Time to intervention, mean (sd)	0.4 (0.8)	0.5 (0.5)	0.76	

Table 1: Clinical characteristics for penetrating cardiac injury, n = 38. Red box denotes no significant difference in mortality between groups.

Columns by: Operative Management	Trauma Surgeon	Trauma + Cardiac Surgeon	P-value	Odds Ratio (95%CI)
n (%)	6 (40.0)	9 (60.0)		
*** Outcomes	***	***	***	
Length of hospital stay, mean (sd)	3.2 (4.0)	12.2 (11.0)	0.08	
Length of ICU stay, mean (sd)	1.7 (2.9)	10.0 (11.4)	0.27	
Death, n (%)				
No, n (%)	2 (33.3)	5 (55.6)		
Yes, n (%)	4 (66.7)	4 (44.4)	0.40	0.40 (0.05-3.0)
Patient discharge disposition, n (%)				
Death, n (%)	4 (66.7)	4 (44.4)		
Discharge to home, n (%)	0 (0.0)	2 (22.2)		
Discharge to rehab, n (%)	2 (33.3)	3 (33.3)	0.43	
Time to intervention, mean (sd)	0.2 (0.1)	4.3 (8.7)	0.32	

Table 2: Clinical characteristics for blunt cardiac injury, n = 15. Red box denotes no significant difference in mortality between groups.

- There was a statistically significant difference in race between penetrating injury patients managed with Trauma Surgery alone versus with Cardiac Surgery assistance. This disappeared when resuscitative thoracotomy patients were removed from the analysis
- There was otherwise no statistically significant difference between the two groups in any of the primary or secondary outcomes

LIMITATIONS

- Single center study, uncommon injury
- Illustrates local institutional practices and resource availability
- Confounding by indication

CONCLUSIONS

- Cardiac Surgery assistance did not affect survival
- Cardiac Surgery remains an invaluable resource for specialty procedures such as cardiopulmonary bypass or valve repair
- Outcomes were better in patients with intact vitals
- More data is needed

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