Pericardiocentesis vs Surgical Drainage: A National Comparison of Clinical Outcomes and Resource Utilization

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Background

- Pericardiocentesis (PC) and surgical drainage (SD) are routinely used to treat significant pericardial effusions. However, the relative outcomes and resource utilization associated with the two treatment strategies are not well characterized.
- We compared the association of initial management strategy with risk of repeat intervention, mortality and resource utilization.

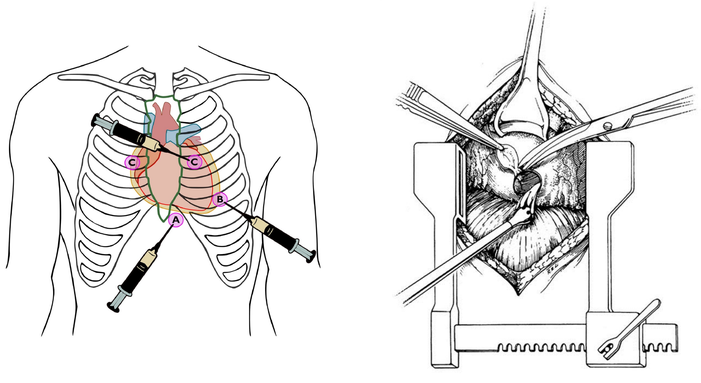

Figure 1. *Schematic of Pericardiocentesis and Surgical Drainage[1, 2]*

Methods

- Patients (≥18 years) with diagnosis of pericardial effusion or tamponade and undergoing PC or SD, excluding trauma and those undergoing concurrent cardiac operations, were identified using the 2016-2018 Nationwide Readmissions Database (NRD) and International Classification of Disease, 10th Revision codes.
- Repeat drainage procedures were identified within 30 days while PC and SD on the same day were counted as a conversion.
- Entropy balancing, a method similar to propensity-matched analysis with the advantage of preserving the entire patient cohort in multivariable regression, was used to account for covariate variation between groups.
- **Primary outcome:** risk of repeat intervention
- **Secondary outcomes:** in-hospital mortality, complications, total duration of hospitalization and overall costs
- Multivariable regressions were used to adjust for differences in patient and hospital characteristics. A multivariable flexible parametric survival model called the Royston-Parmer was used to visualize the cumulative risk of repeat intervention over time.

Results

	PC (n=18,269)	SD (n=11,748)	P-value
Age (years)	65	63	<0.001
Female	48.7%	49.3%	0.54
Elixhauser Index*	5.0	5.1	<0.001
Etiology of effusion			
Malignancy	27.3%	26.9%	0.78
Autoimmune	22.0%	21.8%	
Pericarditis	10.4%	10.1%	
Idiopathic	40.3%	41.2%	

Table 1. *Baseline Characteristics*

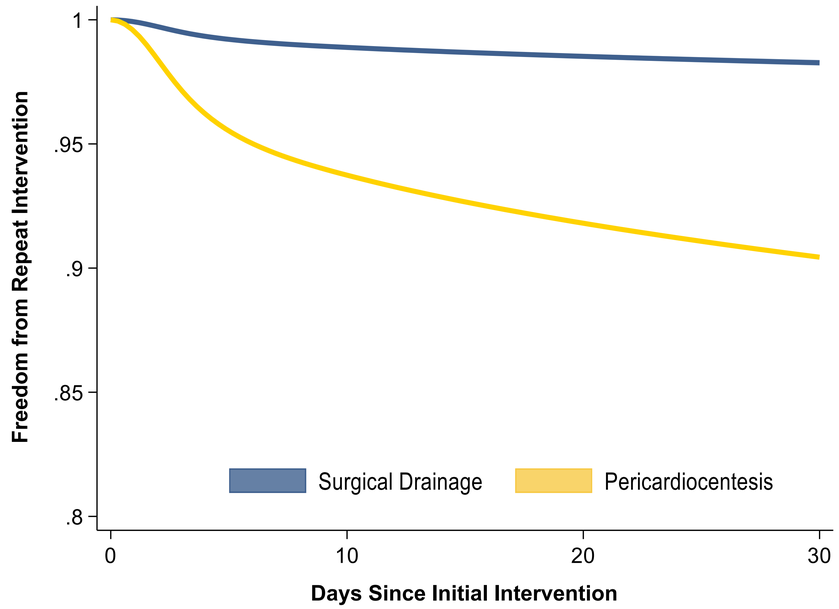

Figure 2. *Royston-Parmer Survival Curves Showing Freedom from Repeat Intervention*

	PC	SD	P-value
Repeat intervention	11.3%	2.6%	<0.001
Mortality	14.8%	12.1%	<0.001
Cardiac Arrest	6.1%	4.2%	<0.001
Accidental puncture	3.8%	1.8%	<0.001
Hemorrhage	1.5%	1.9%	0.11
Stroke	0.1%	0.2%	0.14

Table 2. *Risk-Adjusted Rate of Complications Associated with PC and SD*

Results

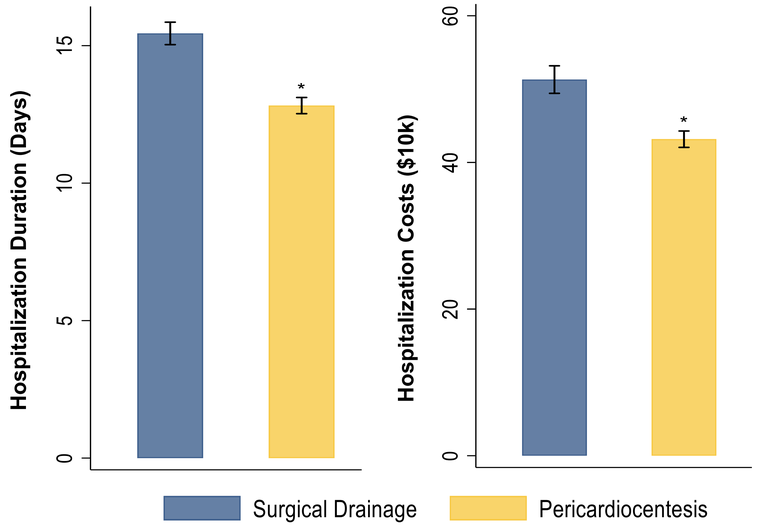

Figure 3. *Risk-Adjusted Hospitalization Duration and Costs for PC and SD*

Conclusion

- Initial treatment of pericardial effusion with PC is associated with increased odds of repeat intervention and mortality when compared to SD.
- However, PC remains associated with reduced overall healthcare utilization as measured by hospitalization duration and total costs.
- This study suggests the need for careful balancing of individual patient factors with healthcare resource considerations during treatment management decisions for patients with pericardial effusion.

References

1. Moores, Darroch W.O. et al. Subxiphoid pericardial drainage for pericardial tamponade. The Journal of Thoracic and Cardiovascular Surgery, Volume 109, Issue 3, 1995, 546 – 552.
2. Sinnaeve, P. R. and Adriaenssens, T. A contemporary look pericardiocentesis. Trends in Cardiovascular Medicine, Volume 29, Issue 7, 2019, 375-383.

* The Elixhauser Comorbidity Index is a validated measure of comorbidities based on ICD diagnosis codes (Range -19 to 89)

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