

Candida Sternal Wound Infections After Cardiac Operations: Uncommon but Deadly

Seo JM¹, Louie BJ¹, Phe K², Ghanta RK³, Trautner BW^{4,5}, Fukuta Y⁴

¹Department of Medicine, Baylor College of Medicine; ²Department of Pharmacy, Baylor St. Luke's Medical Center; ³Department of Surgery, Division of Cardiothoracic Surgery, Baylor College of Medicine; ⁴Department of Medicine, Section of Infectious Diseases, ⁵Baylor College of Medicine; Center for Innovations in Quality, Effectiveness, and Safety, Michael E. DeBakey Veterans Affairs Medical Center

Introduction

- Sternal wound infections (SWI) can be a devastating complication of cardiac surgery resulting in prolonged hospital stays, multiple operative procedures, and poor outcomes.
- The majority of SWI are bacterial infections, including *Staphylococcus aureus* and gram negative bacilli.
- *Candida* species are a less common cause of SWI, and *Candida* SWI is not well described in current literature.
- Advances in surgical technique and availability of new antifungal agents warrant a re-assessment of *Candida* SWI.

Purpose

- Describe the clinical characteristics, management, and outcomes of *Candida* SWI.
- Compare the risk factors and outcomes for *Candida* SWI to bacterial SWI after cardiac surgery.

Methods

- Retrospectively reviewed medical records of 41 patients who had *Candida* SWI after cardiac surgeries between 2013 and 2020 at our medical center.
- Queried our adult cardiac surgery database to obtain data from 76 patients with bacterial SWI for comparison.
- Defined superficial SWI as positive culture isolates involving the skin or subcutaneous tissues, deep SWI as involving deep soft tissues or bone, and mediastinitis as involving the mediastinum.

Results

Table 1: Clinical Characteristics & Comorbidities of *Candida* SWI Cases (n=41)

Average age (years)	60.1
Males	56.1%
Caucasian	70.7%
Prior history of cardiac surgery	46.3%
Heart failure	65.9%
Diabetes mellitus	58.5%
Superficial SWI	9.8%
Deep SWI	70.7%
Mediastinitis	19.5%
Average time until diagnosis of SWI (days)	123.6
Bacterial co-infection	53.7%
Average LOS after infection onset (days)	47

Table 2: Comparison between *Candida* and Bacterial SWI Cases

	<i>Candida</i> SWI (n=41)	Bacterial SWI (n=76)	Odds Ratios (OR)	Confidence Interval (CI)	P-value
Prior history of cardiac surgery	46.3%	7.9%	5.9	2.2 - 15.9	0.0005
Heart failure	65.9%	11.8%	5.6	2.4 - 12.9	0.0001
>48h post-op antibiotic use	39.0%	3.0%	9.9	2.7 - 35.9	0.0005
Overall mortality rate	29.3%	1.3%	22.2	2.8 - 177.2	0.0034

Table 3: *Candida* species associated with SWI (including some cases with co-infection)

<i>Candida albicans</i>	<i>Candida glabrata</i>	<i>Candida parapsilosis</i>	<i>Candida tropicalis</i>	<i>Candida lusitanae</i>
70.7%	12.2%	12.2%	9.8%	0.2%

Results (cont.)

Table 4: Outcomes between different types of *Candida* SWI Cases (n=41)

	Superficial SWI (n=4)	Deep SWI (n=29)	Mediastinitis (n=8)
Clinical cure rate	100%	72.4%	25.0%
Overall mortality rate	25%	24.1%	50.0%

Discussion

- A medical history of heart failure, prior cardiac surgery, and prolonged post-operative antibiotic durations were statistically significant risk factors for *Candida* SWI over bacterial SWI.
- Deep SWI were the most common type of *Candida* SWI.
- Progressively deeper *Candida* SWI had lower clinical cure rates and higher overall mortality rates.

Conclusion

- *Candida* SWI often presents as a serious complication of extensive cardiac surgery with prolonged postoperative ICU stay.
- Prior history of cardiac surgery and heart failure, prolonged surgeries, and complicated postoperative course were significant risk factors for the development of *Candida* SWI when compared to bacterial SWI.
- *Candida* SWI were associated with higher mortality rates.

References

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