

An Algorithmic Approach to the Surgical Management of Sternal Dehiscence: A Single Center Experience

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Background

Deep sternal wound complications following sternotomy represents a complex challenge. Management can involve debridement, flap reconstruction, and rigid sternal fixation (RSF). We present our 11-year experience in the surgical treatment of deep sternal wound dehiscence using a standardized treatment algorithm.

Methods

A retrospective review was conducted of all 134 cardiac patients who required operative debridement after median sternotomy at a single institution between 10/07-3/19. Demographics, perioperative co-variables, and outcomes were recorded. Univariate and subgroup analysis was performed.

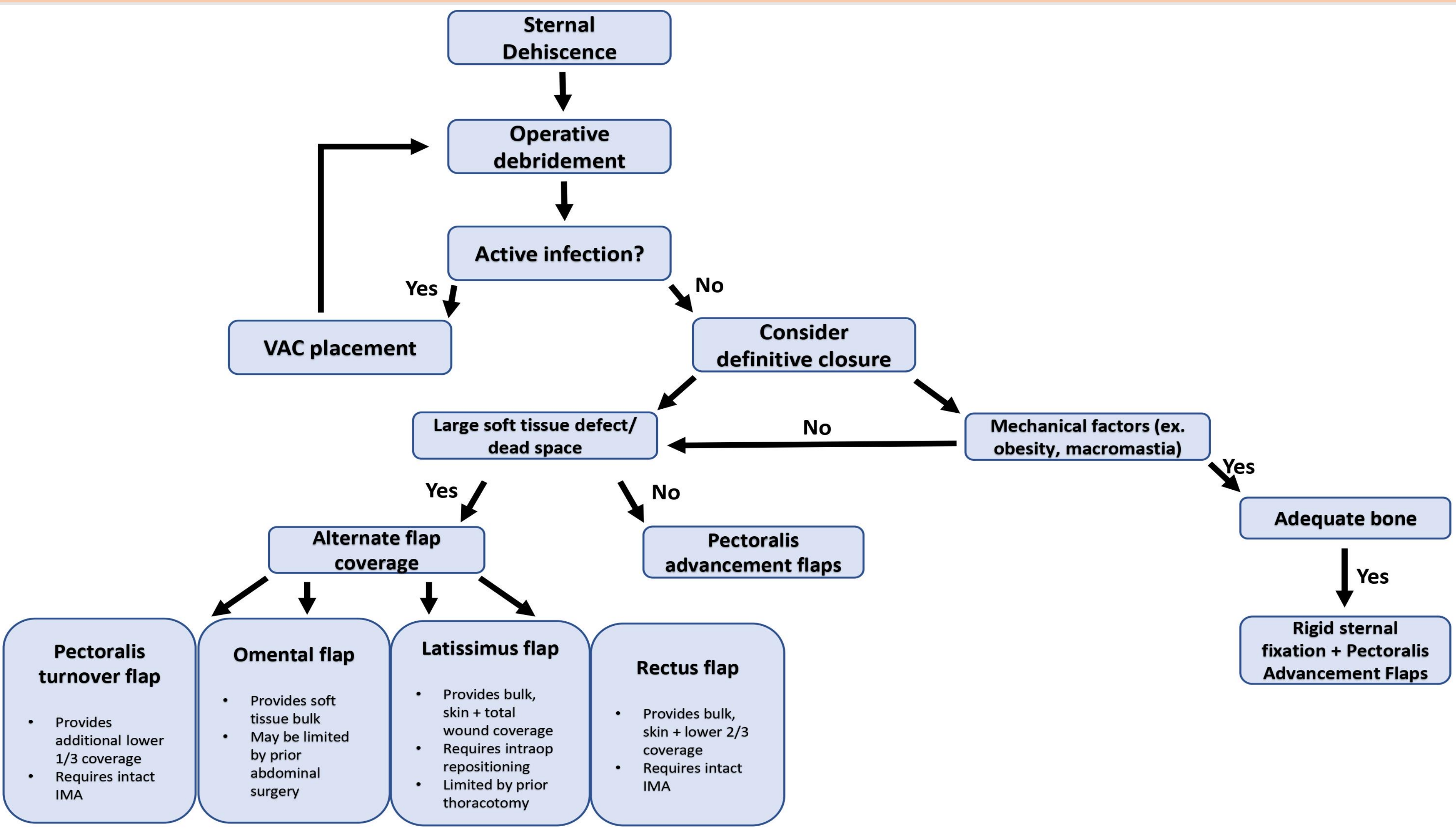
Results

One-hundred-twelve patients (83.5%) with a deep sternal dehiscence underwent flap closure and 56 (50%) rigid sternal fixation. Of the patients who underwent flap closure, 87.5% received pectoralis advancement flaps. 30-day mortality following reconstruction was 3.9%. Median length-of-stay after initial debridement was 8 days (IQR5-15). Of patients with flaps, 54 (48%) required multiple debridements prior to closure, and 30 (27%) underwent reoperation after flap closure. Patients who needed only a single debridement were significantly less likely to have a complication requiring reoperation (N= 10/58 vs 20/54, 17% vs 37%, p=0.02), undergo a second flap (N=6/58 vs 17/54, 10% vs 32%, p<0.001) or, if plated, require removal of sternal plates (N=6/58 vs 11/22, 18% vs 50%, p=0.02).

Covariates	Need for Return to OR Relative Risk (95% CI)	P-value
Female Gender	1.14 (0.80-1.64)	0.53
BMI >32	1.27 (0.89-1.79)	0.21
Diabetes	1.40 (1.06-1.85)	0.04*
Current recent smoker	2.94 (1.57-5.52)	0.001*
WBC >11	1.03 (0.66-1.61)	0.89
Fever on Admission	2.46 (1.11-5.46)	0.03*
Drainage	1.47 (0.90-2.42)	0.15
Positive Cultures	1.18 (1.04-1.34)	0.05*
Multiple Debridements Before Closure	1.61 (1.12-2.31)	0.02*
Rigid Sternal Fixation		
- All patients	1.73 (0.91-3.29)	0.13
- Subset: single debridement before closure	1.65 (0.47-5.73)	0.50
- Subset: multiple debridements before closure	2.18 (1.07-4.44)	0.04*

Table 1. Relative risk (RR) of returning to OR after flap reconstruction by preoperative and intraoperative covariates. For rigid sternal fixation, a subset analysis is presented for presumed infection severity – defined by number of debridements needed prior to flap closure.

Figure 1. Algorithm for sternal wound reconstruction



Conclusions

Although sternal dehiscence remains a complex challenge, an aggressive treatment algorithm, including debridement, flap closure and consideration of RSF, can achieve good long-term outcomes. In appropriately selected patients, RSF does not appear to increase the risk of reoperation. We hypothesize that earlier surgical intervention, before the development of systemic symptoms, may be associated with improved outcomes.

