Comparison of the Treatment of Sternal Infections By Flap Reconstruction Versus Rigid Transverse Titanium Plate Fixation By One Surgeon in One Hundred Forty Nine Consecutive Cases over Thirteen Years

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Background: Treatment of sternal infection with muscle flaps has improved morbidity and mortality over the last thirty years.[1] Post reconstruction sequelae frequently include pain, paradoxical chest wall motion, and decreased pulmonary function. Ringelman et al demonstrated that patients reconstructed with muscle flaps often had long term sequelae due to lack of sternal integrity.[2] We compared muscle flap reconstruction with reconstruction using the DePuy Synthes CMF Titanium Sternal Fixation System. Using transverse titanium plates allowed us to achieve sternal integrity in spite of osteoporosis and fractures of the sternum.

Methods: One hundred and forty nine consecutive patients were operated on by the senior author over thirteen years for sternal infection and/or dehiscence. During the first five years muscle flap(s) closure was used and in the last eight years transverse titanium plates were used together with pectoralis muscle flap advancement. Fisher's exact test was used to test for differences between selected prognostic factors. When the prognostic factor was nominal, but the response was continuous, Wilcoxon's signed rank test, a non-parametric version of the t-test was used instead.

Results: One hundred and forty two patients were available for statistical analysis. Seventy five patients underwent sternal reconstruction using muscle flaps with or without rewiring. Sixty seven patients were treated with the application of Synthes titanium sternal plates and pectoralis muscle flaps. There was no statistical difference between the two cohorts for co-morbidities or demographics (p values > 0.0909). There was no difference between the two cohorts in postop complication rate without pneumothorax (p = 0.1280) or reoperation rate (p = 0.4165) (Table 1). Pneumothoraces were resolved by change in screw type. No difference in mortality was noted (p = 0.9999) (Table 1). There was a significant difference in sternal stability with plated patients achieving high sternal integrity (p<0.0001) (Table 2).

Conclusions: With the introduction of Synthes sternal plates that allowed for attachment to the ribs, nearly all patients became candidates for restoration of sternal rigidity. Those sequelae resulting from an unstable sternum may be significantly reduced using this treatment technique. This retrospective study shows that at the same time infection is eradicated, sternal integrity can be restored; allowing for better pulmonary function, reduced pain, and better quality of life without increasing morbidity and mortality.

References:

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