

## Physician - Coronary Artery Diseases and Surgery

[MSB-44]

### Evaluation of Sternum Closure Methods with Clinical Results in Open Heart Surgery

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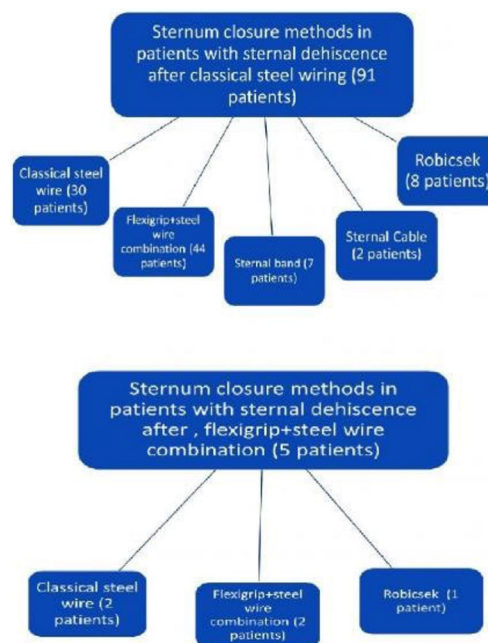
**Objective:** This study aimed to investigate the clinical results of sternum closure methods after open heart surgery with median sternotomy.

**Methods:** This retrospective study screened 2,662 patients who underwent open heart surgery. Classical steel wire, Flexigrip + steel wire combination, sternal cable, sternal band, and Robicsek were used as sternum closure methods in patients. The causality relationships of sternal dehiscence, diabetes mellitus, chronic obstructive pulmonary disease, impaired kidney function, and demographic characteristics of the patients were investigated.

**Results:** Ninety-six patients developed dehiscence, and 60% of them had diabetes, 25% had impaired renal function, and 21% had chronic obstructive pulmonary disease. The treatment success rate was 88% when using the Flexigrip + steel wire combination in patients undergoing sternal dehiscence repair, and the treatment success rate was 76% using a standard steel wire. The combination of Flexigrip + steel wire significantly reduced the risk of sternal dehiscence compared to the use of classical steel wire in sternal closure. Vacuum-assisted closure devices were beneficial in draining wounds and shortened the healing time.

**Conclusion:** Flexigrip + steel wire combination in sternal closure significantly reduced the risk of sternal dehiscence in patients with diabetes mellitus, chronic obstructive pulmonary disease, and impaired kidney function.

**Keywords:** Debridement, sternal dehiscence, sternum, surgery, wound infection.



**Figure 1.** Sternum closure methods in patients with sternal dehiscence.

**Table 1.** Healing status of the patients after sternal dehiscence repair.

| Sternal Closure method           | Number of patients (n) | Number of patients healed (n, %) | Patients requiring additional debridement and reintervention (n, %) |
|----------------------------------|------------------------|----------------------------------|---------------------------------------------------------------------|
| Classical steel wire             | 30                     | 23 (76.4%)                       | 7 (23.3%)                                                           |
| Flexigrip+steel wire combination | 44                     | 39 (88.6%)                       | 5 (97.5%)                                                           |
| Sternal cable                    | 7                      | 5 (71.4%)                        | 2 (28.5%)                                                           |
| Sternal band                     | 2                      | 1 (50%)                          | 1 (50%)                                                             |
| Robicsek                         | 9                      | 7 (77.7%)                        | 2 (22.2%)                                                           |
| Total                            | 96                     | 79 (82.2%)                       | 17 (17.7%)                                                          |

## References

1. Kuonqui K, Janhofer DE, Takayama H, Ascherman JA. A review of 559 sternal wound reconstructions at a single institution: Indications and outcomes for combining an omental flap with bilateral pectoralis major flaps in a subset of 17 patients with infections extending into the deep mediastinum. *Ann Plast Surg* 2023;90(6S Suppl 5):S521-5. doi: 10.1097/SAP.00000000000003478.
3. Phan TQ, Depner C, Theodorou P, Lefering R, Perbix W, Spilker G, et al. Failure of secondary wound closure after sternal wound infection following failed initial operative treatment: Causes and treatment. *Ann Plast Surg* 2013;70:216-21. doi: 10.1097/SAP.0b013e31823b67ec.
3. Netscher DT, Izaddoost S, Sandvall B. Complications, pitfalls, and outcomes after chest wall reconstruction. *Semin Plast Surg* 2011;25:86-97. doi: 10.1055/s-0031-1275175.
4. van Wingerden JJ, Lapid O, Boonstra PW, de Mol BA. Muscle flaps or omental flap in the management of deep sternal wound infection. *Interact Cardiovasc Thorac Surg* 2011;13:179-87. doi: 10.1510/icvts.2011.270652.