

## Nitinol flexigrip sternal closure system and standard sternal steel wiring: Insight from a matched comparative analysis

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**S**ternal wound instability (SWI) and/or infection are still active and life-threatening complications in cardiac surgery. The pathogenesis is not yet clearly defined, and many authors identified several factors, patient or surgeon related, as potential causes.

The Flexigrip (Praesidia, Bologna – Italy) is a sternal closure system, composed of thermoreactive alloy of Nichel and Titanium with a memory effect, which acts as a brace holding together the sternal osteotomy.

We sought to assess the efficiency of two different sternal closure techniques in preventing



sternal wound instability in high risk patients.

Between January-09 and February-12, 2,068 consecutive cardiac-patients have been prospectively collected in our database.

Based on the observation that in the vast majority of cases of sternal wound infections some degree of sternal instability is always present, we com-

pared the results observed in two population of matched patients in whom two different sternal wiring techniques were adopted, using the same triple-layer suture for fascia, subcutaneous tissue and skin.

The 561 patients in whom the thermoreactive-Nitilium-clips (Flexigrip) have been used (Group A), were matched 1:1



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with 561 patients who received a standard parasternal wiring technique (Group B) on 10 available risk factors known to affect sternal wound healing (age, age > 75-year, gender, diabetes-mellitus, cardiac-procedure, obesity, re-intervention, cross-clamp, and total operative times). The study was completed with a cost analysis.

The two groups were well matched, although different for bilateral internal thoracic harvesting, chronic obstructive pulmonary disease, renal insufficiency, and congestive heart failure which were significantly more frequent in Group A. At 30-days of follow-up, the association wound-complication and sternal instability was significantly less frequent in Group A versus Group B (0.2% versus 1.6%) ( $p=0.04$ ). Overall incidence of sternal wound complication was lower in Group A (2% versus 3.5%) ( $p=0.28$ ). In presence of wound infection, a sternal wound instability was never observed in Group A ( $p=0.06$ ). Overall costs were €8,701,854 and €9,243,702 in Group A and B, respectively, thus Flexigrip closure technique offered a €541,848 cost saving. Flexigrip used in high risk patients showed a lower incidence of sternal wound instability with no need of sternal re-wiring in any case, even in presence of wound infection. Flexigrip proved to be also cost-effective.