

<https://www.youtube.com/watch?v=uEXqgNRkHVs>

Sternotomy

- Standard approach
- Sternal fixation with wires for the closure of median sternotomies has been the standard clinical routine
- First introduced in 1897 by Milton
- Safe, fast, inexpensive

Standard approach

Sternal Wound

- Complications
 - Rate 1% (range: 0.4% to 5.1%)
 - Wound infection
 - Dehiscence
 - Bony nonunion
- Increased morbidity and mortality

Sternal Nonunion

- Sternal pain with clicking, instability, or both for more than 3 months in the absence of infection
- An uncommon complication <1%
- Sternal disruption may prevent normal bone healing and lead to nonunion
- Frequently complicated by the presence of multiple transverse fractures which make simple rewiring inadequate
- Instability and *pain* may be associated with impaired PFTs



Risk factors

- Patient factors:
 - Obesity
 - Malnutrition
 - Osteoporosis
 - Diabetes mellitus
 - Corticosteroid use
 - COPD
 - History of radiation therapy
- Other factors
 - Bilateral IMA (diabetes)
 - Technical errors
 - Prolonged operation time
 - Low cardiac output
 - Prolonged postoperative ventilatory support
 - Blood transfusions have been linked to sternal infections

Lower Sternal Reinforcement Improves the Stability of Sternal Closure

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(Ann Thorac Surg 2003;75:1618-21)
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- The lower sternum is the site of greatest instability
- Reinforcement of this area with an additional wire effectively stabilizes the closure
- Figure-of-eight wires are not superior to simple wires.

Treatment

- Plastic surgery
 - Complete debridement of the sternum
 - Pectoral muscle flap reconstruction
- However
 - Chronic pain of the sternal separation due to severe anterior chest instability
 - Prolonged postoperative ventilatory support

Treatment

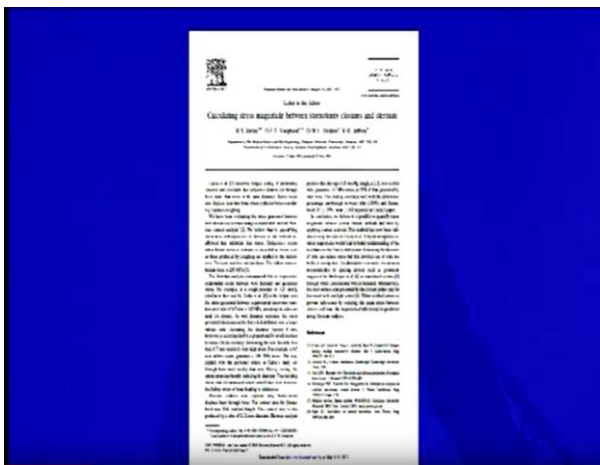
- Sternal rewiring
- Robicsek technique



Treatment

Wires, plates and screws





Sternotomy Sutures: Double Sternal Wire – A & E Medical

- High Strength Sternotomy Closure System
- The Double Sternal Wire provides twice the surface area, twice the tensile strength, and eight times the shear strength of a monofilament sternotomy suture.
- Tapered junction to permit easier transternal or peristernal placement. (see picture 1 below)
- The Double Sternal Wires are quickly and easily installed with the use of the DoubleWire twister. To achieve a consistent and strong twisting result, the twister hook is pulled upward with a simultaneous rotation of the wrist. (see picture 2 below)

Transverse Plate Fixation

- Debridement of devitalized bone
- Exposure of the ribs laterally
- The accurate length of the screws determined
- Approximation of the sternal edges is achieved with reduction forceps



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