

Dehiscent Sternum Fixed with Iso-elastic Polymer SuperCable

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Keywords:

SuperCable, sternum repair, sternum fixation, sternal dehiscence, sternotomy closure, coronary artery disease

Background

In the majority of operations in cardiothoracic surgery at least a part or the entire sternum is opened to gain access to the chest. Therefore, it is important to have material to reliably close and stabilize the sternum until osseous healing is achieved. This is even more important in “high-risk” patients with comorbidities that affect the healing process such as osteoporosis, diabetes, COPD and more. The “SuperCable” sternotomy closure technology is designed to help achieve reliable sternal fixation by providing a “dynamic compression” force, via the iso-elastic property of the polymer materials. This property is intended to provide a better accommodation of the two sternum halves and to help to neutralize the force on the sternum during sneezing, coughing and movements. These specific properties also may help to limit fractures and cut-throughs in osteoporotic bone.^{1,2} Therefore, we believe faster and safer healing, especially in high-risk patients, with less complications and reintervention should be possible. This cable has been favorably reported on in orthopedic bone fixation applications since 2010.^{3,4,5,6}

Case Presentation

A 60-year-old, male patient with a reduced left ventricular ejection fraction and triple vessel disease underwent coronary artery bypass surgery in March 2018 in an external hospital. In October 2019 he presented at the University Hospital St. Pölten with a 10-millimeter wide dehiscence of the distal sternum, broken metal wires, reduced lung function and constant pain. The upper part of the sternum was regularly ossified. As risk factors he had diabetes mellitus, hyperlipidemia, adipositas, arterial hypertension and nicotine abuse. We gained exposure to the distal sternum until the level of the angulus, removed all osteosyntheses material, performed debridement, inserted a temporary drain, and fixed the corpus sterni with a combination of two (2) iso-elastic polymer SuperCables and three (3) wires. In the postoperative follow-up after 3 months his sternum was no longer dehiscent. SuperCable enabled full reconstruction of the chest, restoration of lung function and reduction of pain medication intake.

Conclusion

The SuperCable sternotomy closure system has been used at the University Hospital St. Pölten for sternal closure starting in 2019, and we have found it to be an effective solution for routine primary sternal closure as well as for the more challenging cases such as the one described herein.

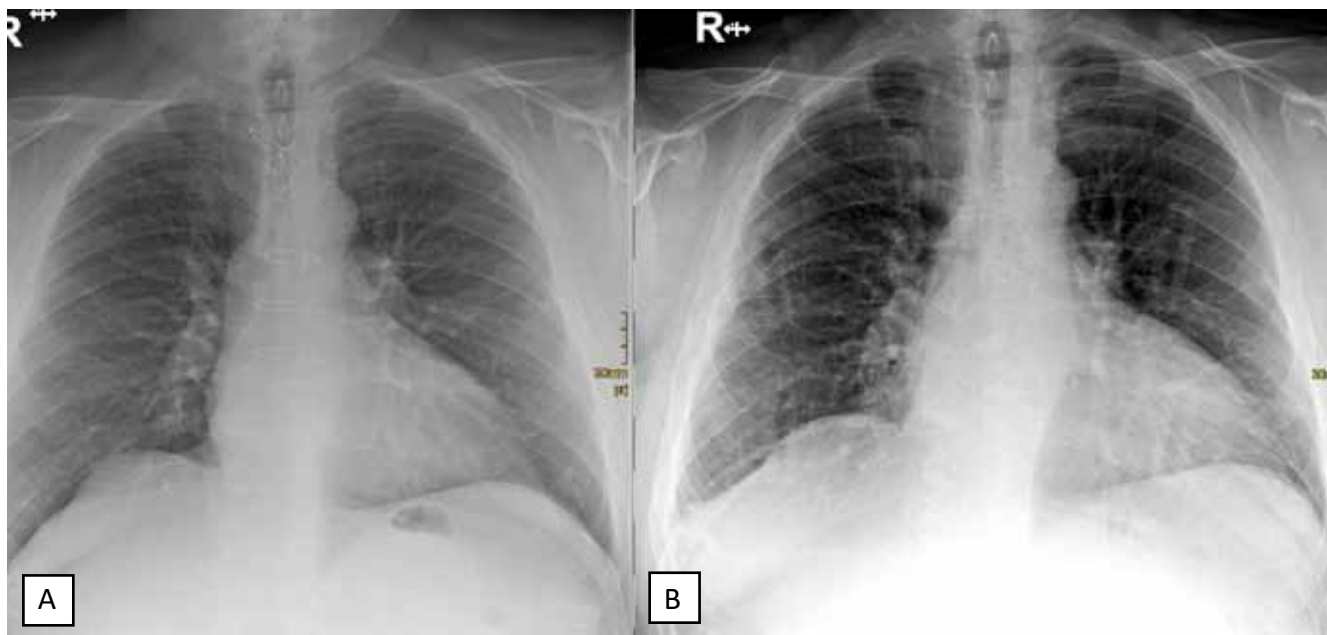


Fig. A. Preoperative radiograph with broken wires and dehiscence. Fig B. Postoperative radiograph with two SuperCables and three wires.

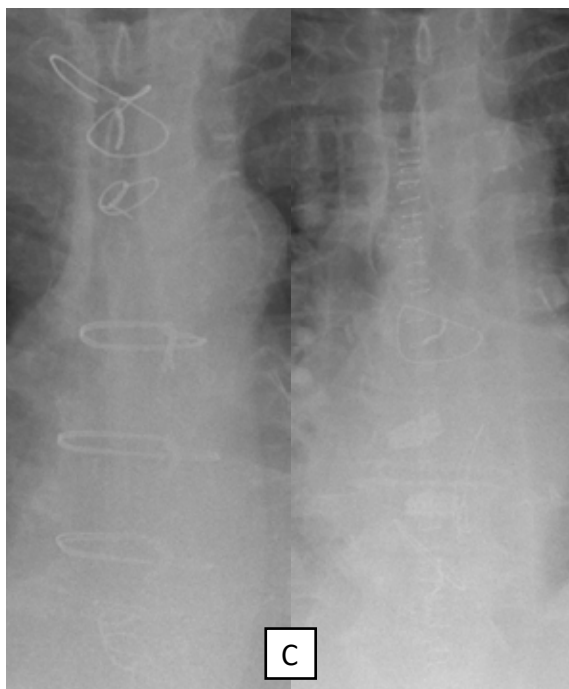


Fig. C. Magnified view of preoperative (left image) and postoperative (right image) sternum.

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