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eComment. Creative solutions in order to treat sternal wound complications in cardiac surgery

Author: Arda Ozyuksel

Department of Cardiovascular Surgery, Medipol University, Istanbul, Turkey

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I read with great interest the article by Kalab and colleagues about their successful results with regard to the reconstruction of massive sternum defects following cardiac surgery [1]. They used allogenic bone transplantation in order to substitute tissue loss due to mediastinitis. Mechanical instability of the sternum is an untoward complication with significant morbidity in the field of cardiac surgery. The risk factors for sternal nonunion are broadly classified as preoperative, intraoperative, and postoperative [2]. Preoperative factors are related to the pre-existing factors in the patients, such as diabetes mellitus, obesity, chronic obstructive pulmonary disease, osteoporosis, and radiation to the chest. The intraoperative risk factors for sternal nonunion are mainly associated with technical errors, such as paramedian sternotomy, harvest of bilateral internal thoracic arteries for grafting, and mechanical failure. Postoperatively, prolonged mechanical ventilation, impaired cardiac output and infectious aetiologies are the most important risk factors associated with increased sternal complications. Several methods, devices and substitution material have been reported in literature. The biological substitution material as emphasized by Kalab *et al.* have the major advantage of optimal mechanical properties, biocompatibility, lower risk of infection as compared to synthetic materials and the ability for new tissue formation by osteoprogenitor cells in the allografts.

I would like to emphasize two other simple precautions that we take in such cases, in order to prevent this untoward complication. Our group introduced another easy and reproducible technique [3]. We used two or three fibula allografts, which serve as a safe and durable landing zone for the circumferential sternal wires, which, in fact, mimic the function and manner of the long axis parasternal wires originally described by Robicsek and colleagues. This techniques makes the safe implementation of the stainless steel wires possible, which decreases the cost when compared with titanium bars and other devices. Secondly, we liberally used the reversed omental flap technique, which is easily brought to the mediastinum with a mini-extension of the skin incision towards the abdomen. The omentum flap has indispensable immunogenic and infection-resistant properties, which effectively fills the space created by the massive tissue loss in the anterior mediastinum. In my opinion development of further creative solutions for reconstructing the sternal nonunion will help to decrease the incidence of this untoward complication of cardiac surgery.

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