CHAPTER 17

MANAGEMENT OF STERNAL DEHISCENCE

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In daily practice of thoracic surgery, median sternotomy is usually performed for pathologies of anterior mediastinal structures (e.g. thymoma, teratoma, intrathoracic goiter), traumas and pathologies involving thorax and lungs bilaterally. Median sternotomy provides excellent access to the heart and surrounding structures. Therefore, it is the most commonly used technique for open cardiac surgery. Transverse sternotomy as known as Clamshell incision that is needed for large tumors, chest trauma or to perform bilateral lung transplantation is used unfrequently. Complications of median sternotomy are seen in 0.5 to 5 percent of patients and mediastinitis is seen in 0.2 to 3 percent of patients [1]. The risk of developing sternal wound site complications may be greater in adults undergoing open heart surgery due to multiple comorbidities compared with other populations (e.g., trauma, children). Using of minimally invasive surgical methods (including robotic surgery, VATS), alternative surgical approaches and catheter-based techniques have reduced the incidence of sternal dehiscence and mediastinitis [2].

Complications occurring at the wound site after sternotomy performed by cardiothoracic surgeons can cause sternal instability. Generally, sternal instability is called as dehiscence. This situation is known as chest cage separation and is seen in the late period of non-union after almost all bone operations. As well as the separation is being limited by a part of the sternotomy, it can be occured totally and covered the entire suture line. We can hear clicking and sense abnormal motion. Although the separation is not always life threatening, the pain caused by the friction of bone surfaces is uncomfortable. It may lead to paradoxical breathing. Paradoxical breathing is mostly seen with almost completely disruption of sternum integrity and accompanying fractures in costal cartilages. As a result, shortness of breath, pain and tachypnea may occur. Sternal instability often turn into an infectious mediastinitis in the early postoperative period if not treated promptly.

Many different causes that could directly or indirectly affect the incidence of sternal dehiscence have been identified in the literature. It has been established that sternal dehiscence develops more frequently in men due to the musculature of the chest, but also in women with large breasts and with diabetes. Also, sternal dehiscence's risk factors are being overweight and regularly taking steroids, receiving immunosuppressive treatment, smoking, and chronic obstructive pulmonary disease (COPD). Being elderly is also identified as another risk factor to increase the developing of sternal dehiscence [3]. The technique of proper incision is an important perioperative factor since the beginnings of median sternotomy as a surgical procedure. A serious deviation from the symmetry axis of the incision often results in disorder of wound healing. Mistakes in ster-

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In conclusion, although minimally invasive methods have been developed and their application frequency has increased sternotomy is still the most common method to reach to mediastinum and heart in cardiothoracic surgery. For this reason, dehiscence continues to be seen. In regards of dehiscence, it is important to determine risks rather than emergency conditions in the preoperative period, to take precautions and to choose intraoperative closure methods. Dehiscence can be detected radiologically using simple and easy methods such as x-ray graphy or 3D CT imaging. In terms of mediastinitis, infection parameters should be followed closely and required antibiotherapy should be started promptly. VAC therapy is recommended for fluid edema in the wound site. Simple and inexpensive traditional methods could be used in the treatment process on sternum dehiscence, but also surgical methods such as muscle transposition, expensive and complex methods such as plates, clips, 3D printer grafts could be used. However, despite all these interventions, mediastinitis can still develop and be fatal. As for this reason, required interventions should be determined early and the treatment method should be decided quickly.

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