

Infection after Open-Heart Surgery

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Background:

INFECTIOUS COMPLICATIONS after cardiac surgery occur in 5% to 21% of cases. Major infectious complications increase postoperative mortality by more than 5 times and prolong recovery. Forty-seven percent of these patients require more than 14 days in the hospital compared with 5.9% ($p < 0.0001$) of patients without a major infection. As a result, infectious complications substantially increase the cost of care. However, infectious complications can be reduced with many simple interventions, starting with risk factor modification at the first anesthetic preoperative screening visit right through to postoperative risk factor vigilance in the intensive care unit (ICU).The most common sites of infection are the respiratory tract (45.7%-57.8%), the surgical site (27.7%), and catheters or devices (20.5%-25.2%). This review describes the incidence, impact, treatment, and prevention of infections occurring perioperatively or within the first 12 months of surgery, focusing on interventions in which the anesthesiologist and intensivist play a key role, as well as those infections in which optimum management has been controversial.Surgical site infections (SSIs) after cardiac surgery can present with a wide range of severity. Superficial sternal wound infections (SSWIs) complicate 0.5% to 8% of cardiac surgery cases and involve the skin, subcutaneous tissue, and pectoralis fascia. Deep sternal wound infections (DSWIs) involve the sternal bone, the substernal space, and the mediastinum but are less common than SSWIs, with an incidence ranging between 0.4% and 2%. However, they are the most important and potentially lethal SSI, doubling mortality when present, and the actual incidence may be 50% to 80% higher when postdischarge surveillance is undertaken.The ideal management of DSWIs is controversial for 2 main reasons: Not all surgeons report equivalent success with a given technique and a DSWI is a heterogenous condition requiring individualized management. Three factors affect the surgical approach: The time of the presentation, the number of risk factors, and whether previous techniques have been tried and failed. The traditional approach is wound debridement, primary closure, and continuous irrigation for several days. Although some centers report poor outcomes with this approach, others continue to use it with or without minor modifications and report excellent results (ie, a 95%-98% cure rate). After debridement, many centers refer for reconstructive procedures. These include pectoralis major, omental, or bipediced pectoralis-rectus abdominis flaps. Long-term outcomes can be excellent (ie, a 90%-93% cure rate).

Conclusions:

A strategy that is becoming more popular is vacuum-assisted closure (VAC). Initial debridement is performed with the removal of sternal wires, and a VAC system is applied. The next stage is performed a few days later either by closure with a tissue flap or by sternal rewiring. Although there are isolated reports of right ventricular rupture after the application of VAC, these are exceptionally rare. The technique appears safe, well tolerated by patients, and a good way of allowing antibiotics to take complete effect before wound closure. In a recent series, in-hospital mortality was significantly lower in patients treated with VAC and delayed sternal rewiring (5.8% v 24.5%, $p = 0.005$) than patients treated “conventionally”

(debridement and irrigation or debridement and tissue flaps). The mortality benefit was still apparent at 5 years. Without comparative, prospective trials, it is impossible to recommend one approach over the other. The management of DSWIs is complex, and prevention by risk factor modification offers the most effective intervention. A host of independent risk factors have been identified for sternal site infections. Of these, cardiogenic shock, long perfusion times, and intra-aortic counterpulsation devices are the most strongly associated with infection. However, obesity, diabetes, smoking, blood transfusions, and cardiac failure also have been identified as important risk factors because of their frequency and the fact that they can be modified by thorough preoperative screening and the initiation of preventative measures .

Key word: *Infection , Open-Heart Surgery, management*