

Sternal Wound Infection: A Surgeon's Nemesis

Bleeding and infection are two adverse events that are commonly a surgeon's nemesis. The midline sternal incision became the incision of choice soon after it was first reported in 1957. Ever since sternal wound infection (SWI) has been a constant postoperative complication,^[1] its incidence has been reported at 2–5% in various series. Blucher M *et al.*, in a landmark publication with data from 26 European countries, reported that the median (interquartile range) for SWI incidence was 3.9% (2.9–5.6%). The total burden of SWIs for all 26 countries after coronary artery bypass surgery (CABG) was €170.8 million.^[2]

Several risk variables, including those related to the patient, are associated with SWI. These included advanced age, obesity, diabetes, active smoking, coronary artery disease, low ejection fraction, steroid therapy, chronic infections, malnutrition, kidney disease, and chronic lung disease. Inadequate skin preparation, the use of bone wax, emergency operations, non-skeletonized (pedicle) or bilateral internal mammary artery (IMA) harvesting, blood product infusion, extended operative and perfusion times, sternal rewiring, postoperative bleeding, intra-aortic balloon pump use, extensive electrocautery use, and antibiotic administration were risk factors related to the procedure.^[3,4]

Various attempts were made to classify SWI based on timing, extent, and management options.^[4] A surgical unit must be aware of these classifications and adopt at least one system, as this becomes the unit's language. Identifying the risk factors for the patients and optimizing them, such as achieving better glycemic control or controlling exacerbations of bronchospasm, should be the goal of every surgical unit.

Surgical steps must be meticulously followed to ensure practices, such as limiting cautery use, avoiding bone wax use or reducing its amount, harvesting skeletonized IMA, avoiding sternal fractures, avoiding un-indicated blood product transfusion, and washing the pericardial cavity before closure. Interrupted sternal wires 7–9 in number, meticulous sheath, subcutaneous fat closure, etc., are additional measures that can be taken to reduce the incidence of surgical wound infections after open heart surgeries.

Implementing strict infection control protocols, such as proper hand hygiene, sterile technique during surgery, and appropriate antibiotic prophylaxis, are inescapable measures to minimize the risk of SWIs.^[3,5] Simple measures, such as teaching patients respiratory exercises and pulmonary clearance before surgery, help reduce SWIs. Simple measures to preserve normal skin commensals by not applying antiseptic solutions or using medicated soap while bathing and cleaning their suture lines from the fifth postoperative day onward were found to reduce incidences of SWI in the author's experience.

Computerized tomography (CT), positron-emission tomography (PET)–CT, magnetic resonance imaging (MRI), and tissue culture sensitivity are critical diagnostic tools that should be used routinely to make the correct diagnosis, determine the extent of involvement, and plan the management.^[4]

In case of wound infection, early debridement, applying negative pressure wound therapy (NPWT), and administering appropriate antibiotics are essential to reduce this morbidity. The timely involvement of reconstructive surgeons can also be beneficial in managing surgical wound infections. They can provide expertise in wound closure techniques, such as using advanced dressings or skin grafts, which can help promote healing and reduce the risk of infection. Various vascularized pedicle grafts, such as the omentum, pectoralis major muscle flap, latissimus dorsi flap, and rectus abdominis flap, are used. Judicious planning based on the site of the wound infection is the key to a successful outcome.^[1,6] Additionally, reconstructive surgeons can assist in identifying and addressing underlying factors that may increase the likelihood of SWIs, such as poor blood flow or compromised tissue. Their involvement can contribute to a comprehensive approach to reducing surgical wound infections after CABG surgery.

More research is needed to assess and develop standard guidelines to prevent socioeconomically significant morbidity and mortalities, which are currently in the range of 18–30% in severe deep SWIs with sternal dehiscence.^[6]

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Submitted: 10-Dec-2023

Accepted: 10-Dec-2023 **Published:** 12-Jan-2024

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Quick Response Code:	Website:
	https://journals.lww.com/aoca
	DOI:
	10.4103/aca.aca_202_23

How to cite this article: Sharma AK. Sternal wound infection: A surgeon's nemesis. *Ann Card Anaesth* 2024;27:1-2.