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QUESTION 3: What type of surgical dressing is most effective for lowering rates of surgical site infection (SSI) in patients undergoing spine surgery?

RECOMMENDATION: There are no randomized studies comparing the use of incisional negative pressure wound therapy (NPWT) to standard dry dressings in spine surgery. The World Health Organization (WHO) recommends the use of incisional NPWT for high risk surgical wounds to reduce the risk of SSI.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 86%, Disagree: 0%, Abstain: 14% (Super Majority, Strong Consensus)

RATIONALE

Incisional NPWT in the form of commercially available incisional suction dressings has recently gained popularity in the management of high-risk wounds in orthopaedic surgery.

These dressings are used at the time of index surgery primarily, with the aim of preventing wound complications such as SSI. Incisional NPWT protects the healing wound by preventing wound edge motion, improving of blood supply, removing of excess fluid and stimulating granulation tissue. A recent meta-analysis of all randomized and case-controlled trials comparing incisional NPWT to standard of care showed a reduction in SSI (50%), wound dehiscence and hospital length of stay [1]. In a pig spine model, Glaser showed improved early biomechanical properties as well as cosmesis in wounds dressed with incisional NPWT compared to standard dry dressings [2].

There are only two studies that have investigated incisional NPWT after spine surgery. A single-institution retrospective case-control study from Duke University showed a 50% decrease in wound dehiscence and a 30% decrease in SSI after a change to incisional NPWT dressing for thoracolumbar deformity wounds [3]. Similarly, a small randomized trial by Nordmeyer et al. showed a decrease in seroma and the need for nursing wound care intervention in patients who were treated with incisional NPWT [4]. The authors hypothesized that a decrease in seroma may lead to decreased SSI, but the study was underpowered to show this difference.

The 2016 WHO recommendations on intraoperative and postoperative measures for SSI prevention proposed prophylactic NPWT on primarily closed surgical incisions in high-risk wounds to reduce the incidence of SSI [5]. This recommendation drew on evidence from abdominal, thoracic and orthopaedic surgery.

In the absence of high-quality randomized trials and given the WHO recommendation, it would be reasonable to use incisional NPWT in settings where the surgeon believes the wound is at risk of infection or breakdown. Spine wounds at high risk of infection include those in patients with diabetes, increased BMI, extended operative times and chronic steroid use [6,7]. In the pediatric spine population, risk factors for SSI include high weight centile, neuromuscular scoliosis, greater comorbidities and prolonged operative time [8].

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