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QUESTION 4: Should vancomycin powder be applied to the wound in patients undergoing spinal surgeries? Are there any potential harms associated with this practice?

RECOMMENDATION: Yes. Evidence suggests that vancomycin powder applied to the wound during spinal surgery reduces the risk of infection. However, the majority of studies lack a control arm and it is not known if vancomycin powder is better than antiseptic agents. There is insufficient evidence for or against the potential harm associated with this practice.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 79%, Disagree: 14%, Abstain: 7% (Super Majority, Strong Consensus)

RATIONALE

Surgical site infection is a known risk of spine surgery with or without instrumentation, and gram-positive organisms are the most common pathogens in such infections. Many practitioners now apply vancomycin powder intraoperatively to reduce the risk of infection. Given concern for vancomycin's adverse effects and antimicrobial resistance, it is critical to consider a risk-benefit analysis of this practice.

A number of studies addressed the efficacy of vancomycin powder use in spine surgery. These have been the subject of several systematic reviews. Xie et al. reviewed 19 retrospective cohort studies and 1 prospective case study, with results suggesting benefit in all but 2 of these with an overall infection risk of 2.83-fold higher for patients not receiving vancomycin powder compared to those receiving it [1]. The authors pointed out study heterogeneity with regard to powder, drug dosage and exposure of bone graft and instrumentation to the drug, citing these as areas for future investigation. This trend toward benefit was confirmed in five other systematic reviews [2–6].

With regard to adverse effects, Ghobrial et al. performed a systematic review of 16 studies with 6,701 patients [7]. Of these, 1 patient developed nephropathy, 2 patients experienced hearing loss, 1 patient had an elevated vancomycin level and 19 patients developed culture-negative seroma. The authors highlighted the lack of in vivo evidence regarding vancomycin resistance. There was a trend toward gram-negative and polymicrobial infections among vancomycin powder recipients in one study [8].

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QUESTION 5: What is the optimal perioperative antibiotic prophylaxis for patients undergoing spine surgery? What considerations should be made in cases of drug allergies?

RECOMMENDATION: The optimal prophylactic antibiotic for an uncomplicated spine surgery is a first- or second-generation cephalosporin given intravenously within 60 minutes of initial incision.

In patients with a history of anaphylactic reaction after use of beta lactams or in countries with a high rate of methicillin-resistant *Staphylococcal* infections, vancomycin in a weight-adjusted dose (15 mg/kg) should be used. Clindamycin 600 mg intravenously is an alternative to vancomycin.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 79%, Disagree: 7%, Abstain: 14% (Super Majority, Strong Consensus)

RATIONALE

Current literature supports the use of prophylactic antibiotics for spinal procedures with or without instrumentation to decrease the risk of surgical site infections (SSI), with a first- or second-generation cephalosporin being the antibiotic of choice [1–6]. In addition, clin-