

QUESTION 3: Is it safe to use a neuraxial anesthesia (NA) in patients with active musculoskeletal infection?

RECOMMENDATION: Yes. The use of NA is safe in patients with periprosthetic joint infections (PJIs) without septicemia. There is limited evidence regarding the use of NA in patients with septicemia or other active musculoskeletal infections.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 93%, Disagree: 3%, Abstain: 4% (Super Majority, Strong Consensus)

RATIONALE

Orthopaedic surgery can be performed under general or neuraxial anesthesia (GA/NA). Besides the reduced requirements for sedatives and opioid analgesics, NA is associated with lower postoperative complication rates and shorter lengths-of-stay compared to GA after major lower limb surgery [1–4]. NA also decreases the incidences of postoperative surgical site infections (SSIs) following total joint arthroplasty (TJA), by decreasing operative time, improving

tissue oxygenation and offering a better ability to maintain normothermia [5].

In spite of its numerous benefits, NA can have severe infectious, vascular and neurological complications, though the rates of such complications are extremely low. Infectious complications may result in devastating morbidity and mortality, such as abscess, meningitis, paralysis or death [6]. Incidences of infectious complications after NA have been reported to be between 0.05 and 0.001% [6]. Pumberger et al. analyzed more than 100,000 consecutive TJA cases utilizing NA and found epidural hematoma in only eight patients, reflecting an incidence of 0.007 % [7].

One of the risk factors for meningitis and epidural abscess, following epidural or spinal block, could be pre-existing sepsis or bacteremia [8–10]. In a recent retrospective study of 101 spinal epidural abscesses, bacteremia was the most commonly identified cause (26%) [11]. A 2017 Practice Advisory by the American Society of Anesthesiologists Task Force reported that NA is only relatively contraindicated in the presence of bacteremia and that the evolving medical status of the patient should also be taken into account. The decision to perform a neuraxial technique should be determined individually and prophylactic antibiotic therapies should be considered prior to the procedure [8].

The safety of spinal and epidural anesthesia in patients presenting with localized infections has been demonstrated in the literature [12–16]. Goodman et al. studied the safety of NA in 531 patients with chorioamnionitis. None of the patients developed an infectious complication [12]. Regarding spinal infections and NA, patient-controlled epidural analgesia may be administered in patients with surgically treated spondylodiscitis as evidenced by the study performed by Gessler et al. [16].

To our knowledge, there are only two original papers directly related to the question of whether NA is safe in patients with active musculoskeletal infections [13,15]. Gritsenko et al. retrospectively evaluated 474 patients who underwent removal of an infected TJA after receiving NA [13]. In this cohort, 4.2 % had bacteremia and 88% had positive intraoperative joint cultures. None of the patients developed meningitis or epidural abscesses but one patient developed a psoas abscess. The authors recommended that no epidural catheters remain in place after the surgical procedure. Rasouli et al. studied 539 patients who underwent revision TJA due to PJIs [15]. A total of 134 patients received NA, 143 received GA and 260 received combined GA and NA. There were no cases of meningitis but one patient developed an epidural abscess after NA. It is important to note that this patient had 6 revision surgeries during a 42-day period, 2 under NA and 4 under GA. Additionally, the diagnosis of an epidural abscess was made 36 days after the last procedure. The abscess was drained and the patient was discharged in good condition. The authors concluded that the incidence of central nervous system infection after NA for PJIs is extremely rare and NA can be considered safe during surgery for PJIs [15].

According to the studies by Gritsenko et al. and Rasouli et al., NA can be considered a safe option during PJI revision surgeries [13,15]. Extrapolating the results from PJI [13,15], spine [16] and obstetric [12] literature, NA may be safe in other cases of active musculoskeletal infection, but there is insufficient evidence for this particular question. The decision of which anesthetic technique to use with active musculoskeletal infections should be determined individually given the current status and co-morbidities of the patient. Additionally, caution should be utilized particularly in patients with septicemia. The numerous benefits of NA must also be considered in this decision-making process.

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