

**COPIC Tip:**

**Nonspine Orthopedic Procedures in Anesthesia Claims**

*Insight from claims data highlights key areas of risk.*

**Background**

The Anesthesia Closed Claims Project database was established in 1984 in response to the malpractice insurance crisis during the 1980s. It was designed to analyze closed malpractice claims to identify causes of anesthesia-related patient injury and liability risk patterns, and improve patient safety. The database, derived from a panel of national and regional medical professional liability companies, includes closed malpractice claims against anesthesiologists from all types of practice settings.

A recent *Clinical Orthopaedics and Related Research* article<sup>1</sup> utilized this data and looked at the type of adverse events and injuries cited in anesthesia malpractice claims for nonspine orthopedic surgery. Patient characteristics, type of anesthesia, damaging events, outcomes, and liability characteristics of claims from 2000 to 2013 (n=475) were compared with claims related to other procedures (n=1592). Three specific high-impact injuries were identified and examined in depth:

1. Neuraxial hematoma
2. Central ischemic neurologic injury in the beach chair position
3. Injuries caused by postoperative respiratory depression

**Key Research Findings**

- Patients undergoing nonspine orthopedic procedures in anesthesia claims were more likely to be generally healthy (ASA physical status 1-2), outpatient, elective status, and have sustained a traumatic injury.
- Regional anesthesia was more commonly used in these cases. With regard to damaging events, nonspine orthopedic anesthesia claims were more likely related to regional blocks and wrong site surgery.
- With regard to severity, orthopedic claims were more likely related to minor injury (specifically, nerve injuries) and less likely related to death.
- In terms of liability, these claims had lower odds of the surgeon contributing to the patient's injury and it was less likely that an anesthesia payment was made.

**Neuraxial hematoma**

In nine of the 10 claims for hematoma after neuraxial anesthesia, diagnosis was delayed by over eight hours from the presentation of symptoms. The mean age of the patients was 78 years and eight of the claims were associated with epidural anesthesia and two with spinal anesthesia. The patients were taking at least one anticoagulant in nine of the 10 cases. Problems in communication between the anesthesia epidural management team and the team managing the anticoagulation regimen were identified in five of the claims; these problems were specifically related to the timing of the epidural catheter removal. One of the hematomas occurred when the anesthesia provider was unaware that the patient had received enoxaparin because of a charting error.

The presenting symptoms in all 10 epidural hematoma claims included atypical severe back pain and lower extremity weakness greater than expected with the local anesthetic concentration administered. The

hematomas resulted in permanent paraplegic deficits in all of the claims. The severity of injury was reflected in the payments for damages.

### **Central ischemic neurologic injury**

No single patient characteristic or intra-operative factor was identifiable in all claims with central ischemic neurologic injury in the beach chair position. Expert review of these claims cited the failure of the providers to consider the difference in blood pressure as measured in the leg and the actual cerebral perfusion pressure in the upright position. Of note, four of the patients in this series had documented anomalies in cerebral circulation (incomplete formation of the circle of Willis, hypoplastic vertebral artery, and moderate carotid stenosis).

### **Postoperative respiratory depression**

Fourteen of the 23 orthopedic claims associated with respiratory depression were deaths. Morbid obesity (BMI > 40 kg/m<sup>2</sup>) was present in eight of the 23 (35%); eight of the 23 (35%) had a diagnosis of obstructive sleep apnea (OSA). The most common procedure performed in this series was total knee arthroplasty. In the OSA group, all claims involved opioid administration for postoperative pain relief. Patient controlled analgesia (PCA) with intravenous opioid dosing was used in 17 of the claims (74%), including five in which the PCA had a continuous basal infusion.

A common theme was difficulty in establishing pain control and/or controlling nausea and itching. This resulted in a change in opioid orders, often with addition of sedating medications. Dose escalation without changes in the intensity or frequency of patient monitoring was identified as causal. Continuous basal infusions of opioid were administered to opioid naïve patients. Oxygen saturation monitoring was used intermittently, as opposed to continuously. When continuous monitoring was used, its value was questionable as event alarms were limited to the patient's room with no remote telemetric monitoring. The highest risk time period for these events was postoperative day one, particularly early in the morning.

### **Conclusions**

While the research study has limitations, mainly related to the necessarily retrospective analysis of closed claims, it highlights several areas of risk for both anesthesia providers and surgeons in nonspine orthopedic surgery:

- With respect to neuraxial hematomas, the diagnosis was generally delayed and most cases involved communication failures between providers caring for the anticoagulated patients.
- In claims with central ischemic neurologic injury in the beach chair position, anesthesia providers failed to consider the blood pressure differentials between measured and the actual cerebral perfusion pressure in the upright position.
- Opioid related claims generally involved respiratory deaths. The addition of adjunct sedating medications, administering basal PCA rates to opioid naïve patients, and inadequate monitoring were all cited as contributing factors.

<sup>1</sup> *Clin Orthop Relat Res.* 2017 Mar 2. doi: 10.1007/s11999-017-5303-z