
An Analysis of 71 Spine Cases with Ischemic Optic Neuropathy from the ASA Postoperative Visual Loss Registry

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Introduction

The most common diagnosis associated with postoperative visual loss (POVL) after spine surgery is ischemic optic neuropathy (ION), but the etiology remains unknown.¹ Suggested, but unproven, risk factors for ION include prolonged prone positioning, hypotension, large blood loss, fluid administration, vasoactive drugs, co-existing diseases, and variation in optic nerve vascular anatomy / physiology. The ASA established the POVL Registry in July 1999 to obtain detailed information on patient characteristics and perioperative conditions associated with POVL to identify potential risk factors for POVL.

Methods

After IRB approval, we identified 71 cases with ION associated with spine surgery from 113 POVL cases submitted to the ASA POVL Registry, and compared them to 9 cases of central retinal artery occlusion (CRAO). Eligibility criteria included any POVL case occurring within 7 days after non-ocular surgery. Cases were reported on anonymous standardized forms from the Registry website [www.asaclosedclaims.org] that recorded perioperative patient data.

Results

Of the 71 cases associated with spine surgery with ION in the ASA POVL Registry, median age was 50 years (range 16 – 73), and 61% of cases were ASA I-II. Most cases involved fusion (91%) and / or instrumentation (84%). Location of the operation was lumbar / lumbo-sacral (68%), thoracic / thoraco-lumbar (14%), thoraco-lumbo-sacral (6%), and cervical / cervico-thoracic (4%). Mayfield tongs were utilized for 14 cases (20%) and surgery involved > 1 level in 90% of cases. Bed frames utilized were Wilson (28%), Jackson (27%), soft chest rolls (20%), knee-chest position (10%), and unknown frame (15%). Mean anesthetic duration was 10 hours (range 3.5 – 18.7 hrs) and 94% of cases

were ≥ 6 hrs (Fig. 1). Mean estimated blood loss (EBL) was 3.8 L (range 0.1 – 25) and 85% of cases had an EBL ≥ 1 L (Fig. 2). CRAO cases ($n = 9$) had a significantly lower mean anesthetic duration (6.4 hrs) and EBL (0.7 L) compared to ION cases ($p \leq 0.05$). The cumulative percent of ION cases with ≥ 15 min. systolic blood pressure (SBP) ≤ 70 mm Hg was 6%, ≤ 80 mm Hg was 20%, ≤ 90 mm Hg was 62%, ≤ 100 mm Hg was 79%, and ≤ 110 mm Hg was 90%.

Figure 1:
Anesthetic Duration in Spine ION Cases ($n = 71$)

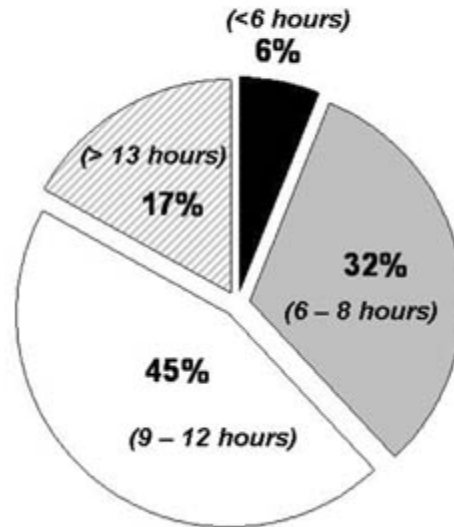
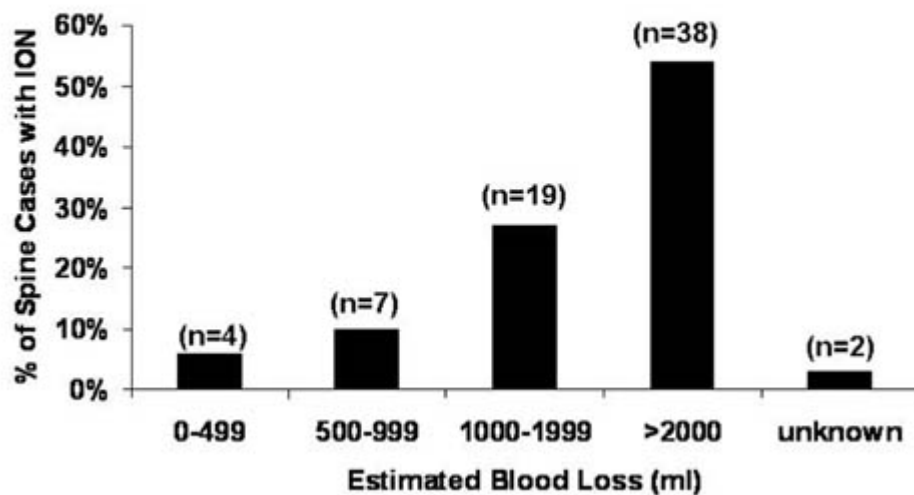


Figure 2:
Estimated Blood Loss in Spine Cases with ION ($n = 71$)



Conclusions

EBL and duration differed significantly between CRAO and ION cases in the ASA POVL Registry, suggesting different etiologies for these lesions. Type of surgical frame varied widely with ION cases. Although most ION cases were associated with prolonged prone spine surgery (≥ 6 hrs), large blood loss (≥ 1 L), and SBP ≤ 100 mm Hg, wide ranges in these variables suggests a multi-factorial etiology for ION, and may include unseen intrinsic patient factors.

References

- ¹ Roth S. Postoperative Blindness. In Miller RD, ed. Anesthesia. New York: Elsevier, 2005.