A Comparison of Thoracic Epidural Infusion and a Multimodal Analgesia Protocol for Pain Management Following the Nuss Procedure

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INTRODUCTION

- Pain management following surgical correction of pectus excavatum is challenging\(^1\), and the ideal analgesic strategy remains uncertain\(^2\).
- We recently adopted a comprehensive multimodal protocol that standardizes perioperative analgesic management.
- We retrospectively compared opioid consumption and pain control in a cohort of patients who underwent a Nuss procedure and were managed with either a multimodal analgesic protocol or a thoracic epidural infusion.

METHODS

With IRB approval, we conducted a retrospective cohort comparison of 51 patients, 8 to 21 years of age, managed with either a thoracic epidural infusion (group TE, n=22) or multimodal analgesic protocol (group MA, n=29) from 1/1/11 - 9/15/15. The specifics of the multimodal protocol are described in Figure 1.

Patients in the TE group were managed with an infusion of 0.15% ropivacaine with clonidine 0.6mcg/ml. Patients in both groups had a PCA postoperatively which was managed by the pain service and discontinued following transition to oral analgesics. Our primary outcome, total daily opioid consumption in morphine equivalents, was presented as an average by postoperative day (POD) from 6am to 6am.

Groups were compared using a t-test for equality of means. Secondary outcomes, including median daily pain scores and length of stay (LOS), were also collected and presented.

RESULTS

- Patients were similar in age, gender, weight, and ASA status.
- Patients managed with the multimodal analgesic protocol received more opioid in the operating room but required less opioid on POD 1-3 when compared to patients managed with a thoracic epidural (Table 1).
- Median daily pain scores were in the mild – moderate range (Table 1).
- Median LOS (25-75 IQR) was 3.5 (1.3) for the MA group and 4.5 (1.3) for the TE group.
- 52% of patients in the MA group were discharged on POD 3 compared to 9% in the TE group (Figure 2).

DISCUSSION

- Similar to other groups\(^3\), we found that adoption of a standardized, intraoperative analgesic protocol improved outcomes in our patient population.
- Interestingly, patients in both groups had similar pain scores but the MA group used less opioid on POD 1 - 3.
- Gabapentin may be a useful adjuvant as pain following the Nuss procedure likely has a somatic and neuropathic origin.
- Anecdotally, the primary barrier to discharge for the MA group was return of bowel function rather than pain control.

CONCLUSION

Implementation of a standardized multimodal analgesic protocol resulted in effective analgesia when compared to a thoracic epidural, while also producing a significant reduction in total postoperative opioid consumption and reduction in total LOS.

REFERENCES

3. Muhly WT, Maxwell LG, Hainsworth MI, Maxwell C, Weisman SJ, Oldham KT. Initial surgical and pain management outcomes after Nuss procedure likely has a somatic and neuropathic origin.

[Figure 1. Multimodal pain management pathway for patients undergoing the Nuss procedure.]

[Table 1. Opioid use in morphine equivalents and pain scores for the thoracic epidural (TE) and multimodal analgesia (MA) treatment.]

[Figure 2. Percentage of patients discharged by postoperative day for the thoracic epidural (TE) and multimodal analgesia (MA) treatment.]