

A Single Centre Retrospective Audit of Post-Operative Analgesia Requirements Following Pancreatoduodenectomy (Whipple's)

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Background

Current ERAS (Enhanced Recovery After Surgery) society guidelines recommend intra/post-operative mid-thoracic epidural anaesthesia (EA), to offer superior pain relief and reduced respiratory complications relative to intravenous opioids following pancreatoduodenectomy. (1) A 2019 meta-analysis further showed EA to be associated with marginally lower pain scores, fewer complications, reduced hospital stay and lower mortality rates. (2) A Cochrane review also highlighted continuous EA to be superior to patient-controlled analgesia (PCA) in pain relief <72 hours post open abdominal surgery. (3) Despite this, when comparing EA with intravenous (IV) analgesia following pancreatoduodenectomy there was a 3x prevalence of complications. (4) These included increased rates of haemodynamic instability affecting anastomosis integrity, intestinal perfusion and ileus. (4)

Aims

To investigate the post-operative analgesic requirements for patients undergoing a pancreatoduodenectomy, and assess the complication rates using epidural, spinal and non-neuraxial analgesia at University Hospital Geelong.

Methods

- Retrospective analysis of data obtained from medication charts of patients who underwent a pancreatoduodenectomy between January 2014 to December 2018.
 - Inclusion criteria: patients undergoing elective pancreatoduodenectomy surgery at University Hospital Geelong.
 - Exclusion criteria: patients who died during their hospital stay or underwent an alternate procedure after being initially planned for a pancreatoduodenectomy.
- Information gathered on opioid analgesia was obtained from patient medication charts and converted to oral morphine equivalents (OME) to allow comparison, using the ANZCA Faculty of Pain Medication opioid dose equivalence. (5) All dosages presented in this report have been converted to OME to allow comparison unless otherwise stated.
- Patients were categorised into three groups based on intra-operative analgesia used: epidural, spinal or non-neuraxial.
 - Total post-operative morphine equivalents were calculated between groups as a surrogate to identify post-operative pain.
 - Further results included days until bowel opening, length of hospital stay, inotropic support requirements and post-operative complications.

Results

- Of the 44 patients who underwent a pancreatoduodenectomy, 31 were included within the study. They were grouped by the analgesic modalities they utilised (Figure 1).
- 3 of the 5 epidurals failed either intra or post-operatively, requiring transversus abdominis plane block insertion. The average intra-operative opioid use for successful epidurals was 48mg.
- 11 patients received spinal analgesia with average opioid use of 71mg (35-110mg).
- The remaining 15 patients underwent non-neuraxial intra-operative analgesia, including lignocaine, ketamine infusions or a combination of both (Figure 2). The average opioid consumption was 117mg (30-285mg).
- Average post-operative morphine consumption between groups showed epidurals = 228.33 OME, spinal = 572.633 OME and non-neuraxial analgesia = 759.97 OME (Figure 5).
- Length of hospital stay, inotrope requirement and complications are shown in Figures 3-4 and Table 1.

Intra-Operative Analgesia Modality

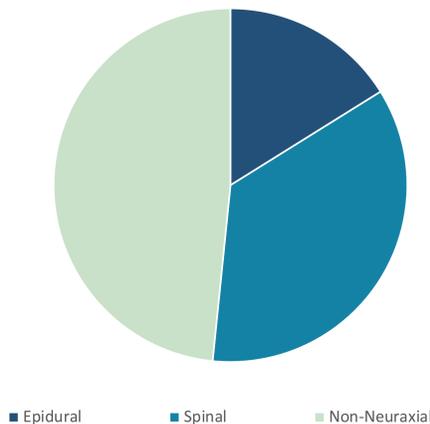


Figure 1: Type of intra-operative analgesia used for patients undergoing pancreatoduodenectomy at University Hospital Geelong between January 2014 and December 2018. Represented as a portion of total patients within the study. (N=31)

Intra-Operative Oral Morphine Equivalent Consumption

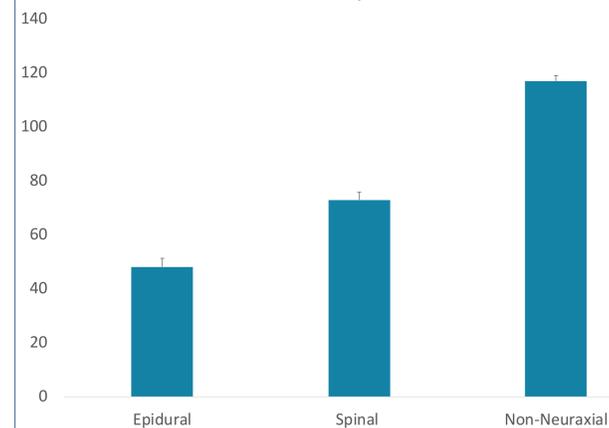


Figure 2: Intra-operative oral morphine equivalent consumption during pancreatoduodenectomy for patients with epidural, spinal or non-neuraxial analgesia.

Length of Hospital Stay

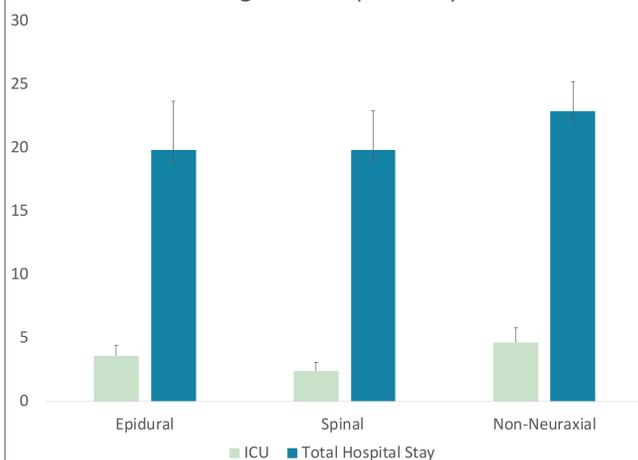


Figure 3: Length of hospital stay in ICU and total days of patients undergoing pancreatoduodenectomy following epidural, spinal or non-neuraxial intra-operative analgesia.

Patients Requiring Inotropic Support Per Intra-Operative Analgesic Type

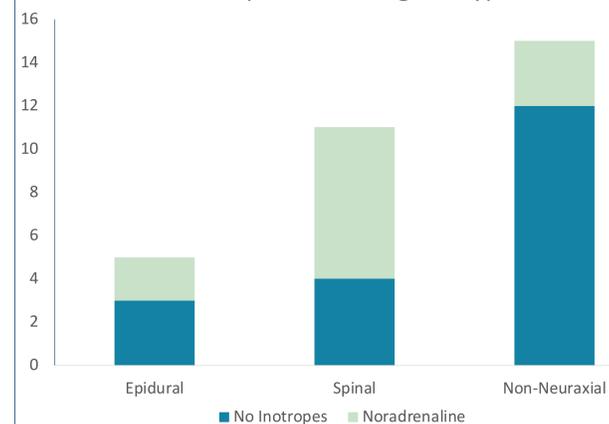


Figure 4: Total number of patients requiring inotropic support post-operatively following intra-operative oral morphine equivalent consumption during pancreatoduodenectomy for patients with epidural, spinal or non-neuraxial analgesia.

Total Post-Operative Opioid Use (OME) Per Intra-Operative Analgesia Modality

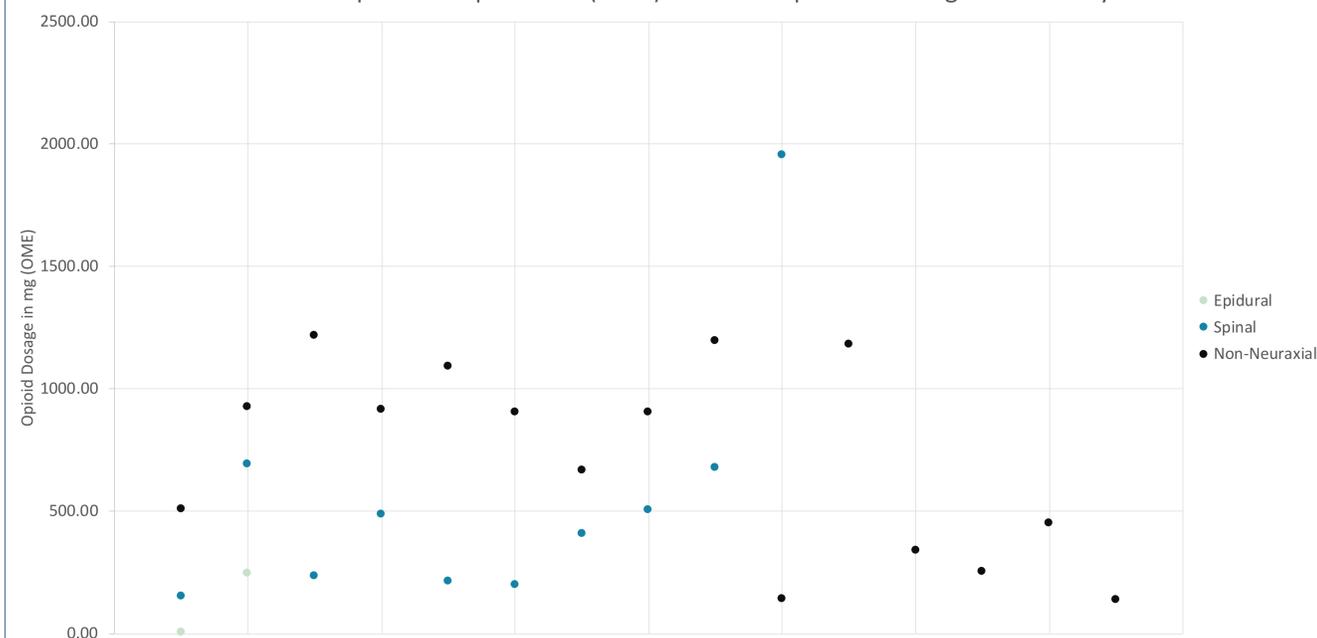


Figure 5: Total number of patients requiring inotropic support post-operatively following intra-operative oral morphine equivalent consumption during pancreatoduodenectomy for patients with epidural, spinal or non-neuraxial analgesia.

Complications	Epidural (n=5)	Spinal (n=11)	Non-neuraxial (n=15)	Total
Intra-abdominal collections/anastomotic leaks	0	3	8	11
Hospital acquired pneumonia	1	2	1	4
Return to theatre	0	2	3	5

Table 1: Complications experienced by patients post-operatively following pancreatoduodenectomy's conducted at University Hospital Geelong.

Discussion

- From the data obtained, and recognising the limitations of the small sample size, the most salient findings include:
 - Of the analgesic modalities, patients who received successful EA required the least amount of intra and post-operative opioids. However, the difference in amount of opioid is unlikely to be clinically significant, especially when compared to the spinal analgesia route, and we noted a high failure rate.
 - Systemic analgesia, without supplementation by either epidural or spinal analgesia, was associated with the highest opioid consumption.
 - The length of ICU and total hospital stay was near identical across analgesic modalities, despite the variation in opioid consumption.
 - Numbers of patients were insufficient to allow conclusions regarding associations with major post-operative morbidity.

Conclusion

In patients undergoing pancreatoduodenectomy, successful EA does provide some additional analgesia benefit over non-epidural modalities. Spinal analgesia (a single shot technique with a clear endpoint and low failure rate) appears to offer a degree of this benefit. Both modalities reduce opioid consumption; but the high failure rate of EA suggests a reconsideration of its clinical utility.

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