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What Is the Best Pain Control After Major Hepatopancreatobiliary Surgery?

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Keywords

• Analgesia • Enhanced recovery • Epidural • ERAS • Hepatectomy
• Pancreatoduodenectomy • TAP

Key points

- The vast majority of hepatopancreatobiliary (HPB) surgery continues to be performed through an open approach, and the best modality to obtain adequate pain control continues to be a challenge.
- Currently, epidural analgesia is the most supported analgesic modality by high-level evidence (randomized clinical trials in liver surgery) for pain control, patient satisfaction, and minimization of total opiate use after HPB surgery.
- Historic concerns for analgesia-related events from epidural analgesia have not been observed in the most recent high-level studies.
- Randomized clinical trials comparing newer analgesic modalities (ie, transversus abdominis plane infiltration) versus epidural analgesia in the modern setting of enhanced recovery protocols after HPB surgery are currently on going.

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INTRODUCTION

In the modern era, hepatopancreatobiliary (HPB) surgery has become safe with significant reductions in morbidity and mortality at high-volume centers for both liver and pancreas surgery. Although laparoscopic surgery has provided a safe approach with superior pain control, laparotomy is still needed for most HPB operations. Inadequate pain control is not only associated with poor patient experience but also contributes to inferior outcomes. Specifically, inadequate pain control affects the neuroendocrine stress response, increases complication rates, and prolongs length of stay. Furthermore, there is an ongoing opioid epidemic, and all fields of medicine should strive to reduce narcotic use to limit transformation into chronic opiate dependence. As such, successful pain control after HPB surgery continues to be a challenge, and rigorous studies evaluating postoperative results are needed.

This article reviews the modalities debated to be the best strategies for pain control after major HPB surgery and discusses other important considerations when executing these plans.

Biologic effects of opiates

There are multiple reports in the literature on the negative effects opioids can have on patient function and on cancer biology [1,2]. Emerging data point to direct opioid-cellular interactions that explain these observations. Opiates have been reported to activate vascular endothelial growth factors, directly stimulating cancer growth and metastatic potential [1–3]. Moreover, worse survivals in patients with breast and lung cancer were reported when the tumors expressed certain polymorphism of the μ-opioid receptor (MOR) [4,5]. Additional studies focused on the effects of MOR on epithelial mesenchymal transition (EMT) [1], which is a necessary oncogenic process involving loss of cell-cell adhesion, subsequent loss of basoapical polarization, cytoskeletal remodeling, and increased cell motility and transcription factors for cancer cell growth and metastasis [6]. MOR regulates opioid and epidermal growth factor signaling, which is important for human cancer cell proliferation and migration. In addition, human cancer cells treated with opioids exhibited an increase (snail, slug, vimentin) and decrease in other (ZO-1 and claudin-1) protein levels consistent with an EMT phenotype [1]. Taken together, these results suggest that opioid-MOR interactions may have a direct effect on the proliferation, migration, and EMT transition for cancer progression. These findings have led to human clinical studies investigating the effects of analgesia agents on cancer outcomes, including recurrence and overall survival.

Opioid epidemic

Currently, the United States is suffering from a national crisis with opioid abuse with more than 600,000 deaths to date, and with a prediction of 180,000 additional mortalities by 2020 [7]. The opioid epidemic is accounting for an annual cost of more than $50 billion per year of treating prescription opioid use and abuse [8]. Moreover, opioid-naïve surgical patients are at high risk for becoming chronic opioid users [9], and minimizing the need for