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Preemptive And Multimodal Analgesia For Open Whipple Procedure.

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Introduction

This case describes the successful management of postoperative pain with multimodal analgesia following Whipple procedure in the absence of neuraxial epidural analgesia. We decided to go ahead with multimodal analgesia following two unintentional dural taps.

Case Description

A 77-year-old, 85 kg female, following failure of thoracic epidural technique secondary to two unintentional dural taps, had open Whipple procedure. She received preemptive hydromorphone and fentanyl prior to incision; intermittent fentanyl and hydromorphone were administered as needed. Dexmedetomidine infusion was continued throughout the procedure. Acetaminophen (1 gm) was given intravenously towards the end of the 6-hour-long procedure. Bilateral transversus abdominis plane block was done with 60 cc of 0.25% bupivacaine prior to extubation. Patient had complete pain relief for the first 10 hours and then used patient-controlled analgesia with minimal use hydromorphone for adequate and satisfactory pain control for the next 48 hours.

CASE DISCUSSION

A multimodal analgesia approach has an opiate-sparing effect and is effective in controlling postoperative pain. It should be considered in the perioperative period¹.

<u>Analgesia Method</u>	<u>Mechanism</u>
Acetaminophen	Prevents prostaglandin synthesis.
NSAIDs	Prevent prostaglandin synthesis by inhibiting cyclooxygenase enzymes.
Alpha 2 agonists (clonidine, dexmedetomidine)	Decrease the release of norepinephrine from sympathetic nerve endings. The receptors are primarily located in the locus coeruleus of pons. They potentiate descending inhibitory pathways of nociception.
Opioids	Act on Mu receptors located primarily at periaqueductal grey matter in the brain and substantia gelatinosa in the spinal cord by decreasing the release of substance P.
Ketamine	Primarily acts at NMDA receptors located at the peripheral nociceptive neurons that synapse in the dorsal horn of the spinal cord by calcium channel blockade.
Magnesium	Blocks the calcium channels.
Lidocaine infusion	By membrane stabilization through sodium channel blockade.
Gabapentin	Acts at GABA receptors by blocking the calcium channel.
Regional anesthesia/nerve blocks	Block the afferent conduction of pain pathways.

Preemptive analgesia: The administration of analgesics prior to incision prevents central sensitization and decreases postoperative pain.²

Evidence for the effectiveness of pre-emptive analgesia

Trial	Result
Richmond CE et al, RCT (n=60) ³	Preemptive intravenous morphine reduced postoperative pain in hysterectomy patients
Jahangiri et al, RCT (n=24) ⁴	Preemptive administration of epidural bupivacaine and opioids reduces phantom limb pain after major lower limb amputation
Ong et al, meta-analysis (66 studies, n=3261) ⁵	Preemptive epidural, NSAIDs and local infiltration of the wound was found to be effective. There was no benefit from pre-emptive administration of opioids and NMDA receptor antagonists.
Møiniche et al, meta-analysis (80 studies, n=3761) ⁶	Preemptive analgesia did not make a difference compared with post-incisional analgesia.
Steinberg et al, meta-analysis and systematic review of 69 studies	Preemptive administration of narcotics and non-narcotic multimodal analgesia reduced post-operative pain compared to post-incisional administration of analgesics in hysterectomy patients.

CONCLUSION

Based on our experience with this patient, preemptive analgesia and a multimodal approach of pain control are effective in reducing postoperative pain after major upper abdominal surgery in comparison to neuraxial epidural technique.