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Multimodal Analgesia for Open Liver Resection in an Anti-coagulated Patient

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DISCUSSION

Patients undergo surgery which results in acute pain that can put them at risk for developing chronic post-surgical pain. Understanding the mechanisms of pain transmission and plasticity and that traditional analgesic techniques may increase the risk of developing this problem is a key to acute peri-operative pain management. Interrupting pain transmission via peripheral nerve blockade, pain modulation via glutaminergic pathway antagonism, and pain perception with opioids and CNS depressants are keys to successful peri-op analgesia and avoidance of long-term pain syndromes. However, many medications at our disposal have short and long-term effects; both beneficial and adverse—opioids and α2 agonists are two examples. Intravenous lidocaine and gabapentin are modalities also with evidence of short and long-term benefit for peri-op pain. Multi-modal analgesic techniques should be considered in all patients, weighing risk to benefit ratios, particularly when multiple comorbidities are present which make peri-op pain management challenging.

REFERENCES


CASE DESCRIPTION

A 55 year old male with a history of alcoholism, smoking, mitral valve replacement on chronic anticoagulation and thrombocytopenia underwent laparoscopic left hepatectomy converted to laparotomy for carcinoid tumor. He received 500 micrograms of intravenous (IV) fentanyl at the beginning of the case, and near the conclusion of a four hour case he received IV clonidine 40 micrograms and IV ketamine 40 milligrams, as well as bilateral transversus abdominis plane block (TAP) with bupivacaine. He was extubated in the operating room. His PACU course required only 0.4 mg of IV hydromorphone, and phenylephrine infusion for hypotension without adverse neurologic or cardiac event. The remainder of his hospital course required very minimal intravenous narcotics transitioned to oral hydrocodone.

TAP BLOCK1

- Compartment block
- Blocks ventral branch of T7-L1
- Blocks spinal, ilioinguinal, iliohypogastric nerve
- For middle/lower abdomen surgery
- Site of injection: Triangle of Petit (iliac crest, latissimus dorsi, external oblique) Fig. 2
- Decrease in post-op narcotic consumption
- Provides analgesia to abdominal wall, spares viscera

SIDE EFFECTS:
- Peritoneal puncture, local anesthetic toxicity, liver hematoma (rare)

KETAMINE2

- NMDA receptor antagonist
- Amnesia/intense analgesia subanesthetic doses
- Kappa-receptor agonist, Mu-receptor antagonist
- Mild local anesthetic-like effect
- Anti-inflammatory properties (inhibit IL-6)

SIDE EFFECTS:
- Psychomimetic side effects proportional to plasma concentration of ketamine
- Sympathetic stimulation

CLONIDINE2

- 220:1 α-2 to α-1 agonism
- Produces sedation, hypnosis, anxiolysis, sympatholysis, analgesia
- Decrease post-op narcotic & VAS scores
- Treatment for alcohol withdrawal

SIDE EFFECTS:
- Prolonged hypotension, bradycardia, sedation

POISE-2 Trial3 (ongoing, prospective, interventional, randomized control trial)
- Treatment with oral α-2 agonist and low dose ASA perioperatively
- Evaluate all cause mortality & non-fatal MI at 30 days and 1 year, including chronic post-op pain, stroke, & acute kidney injury, after non-cardiac surgery

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