Serratus Plane and Rectus Sheath Blocks with Liposomal Bupivacaine after Upper Abdominal Surgery

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INTRODUCTION

Analgesia following upper abdominal surgery has been described utilizing neuraxial, regional, and local anesthetic infiltration techniques with a goal of providing pain control while reducing opioid requirements, facilitating early ambulation, return of bowel function, and timely hospital discharge (1). We describe a novel regional anesthetic technique, the ultrasound-guided serratus plane block in conjunction with a rectus sheath block, for post-operative analgesia of the upper abdomen following a subcostal incision in two patients who presented for upper abdominal surgery.

CASE 1

A 79-year-old male with a history of chronic cholangitis and multiple biliary interventions developed recurrent biliary stricture and presented for exploratory laparotomy with lysis of adhesions and hepatocystopexy. Pre-operative thoracic epidural was deferred due to a plan for initiation of therapeutic anticoagulation for his DVT in the postoperative period.

Intraoperatively, the patient had a right subcostal incision with midline extension to just above the umbilicus. He received a total of 315 micrograms (mcg) IV fentanyl during the 6-hour procedure. Prior to emergence, a right serratus plane block and right sided rectus sheath block were performed under direct visualization by ultrasound guidance. A total of 133 milligrams of liposomal bupivacaine was diluted to a total volume of 30 mL, with 15 mL injected in the serratus plane block, and 15 mL injected in the right rectus sheath using a 21-gauge, 3.5-cm centimeter 0.58 needle.

Post-operatively, on POD 0 the patient's pain was well controlled, with pain scores of 2-3/10 on a 0-10 NRS and he received a total of 3 tablets of 5/325 oxycodone/acetaminophen. On POD 1 he received 4 doses of 2 tablets of 5/325 oxycodone/acetaminophen, using a total of 11 tablets during his inpatient hospitalization. He was discharged to home on POD 2.

CASE 2

A 58-year-old male with gangrenous cholecystitis underwent a laparoscopic cholecystectomy which was converted to an open approach. The procedure was performed through a right subcostal incision.

Intraoperatively, he received a total of 250 mcg IV fentanyl and 0.5 mg IV hydromorphone. Prior to emergence, a right serratus plane block and right sided rectus sheath block were performed under direct visualization by ultrasound guidance. 266 mg of liposomal bupivacaine was diluted to a total volume of 30 mL, with 15 mL injected in the serratus plane block, and 15 mL injected in the right rectus sheath using a 21-gauge, 3.5-centimeter 0.58 needle.

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DISCUSSION

We present two cases of ultrasound-guided rectus sheath and serratus plane blocks using liposomal bupivacaine following upper abdominal surgery as a novel technique for post-operative pain control. Both patients had adequate pain control with relatively low doses of opioid based pain medication in the post-operative period. There are multiple techniques described for pain control in this setting with each having associated advantages and disadvantages (2).

The rectus sheath block is a well described technique for providing analgesia for midline upper abdominal incisions (3). This block is technically easy to perform, and with the introduction of liposomal bupivacaine, has the potential to provide up to 72 hours of pain control (Figure 1).

The serratus plane block is relatively safe and easy to perform under direct ultrasound guidance. It is also reasonable to expect this block to provide analgesia of the lateral thoracic wall (1). It is also reasonable to expect this block to provide analgesia of the abdominal wall because the nerves supplying the upper abdomen are the continuation of nerves supplying the lateral thoracic wall. The serratus plane block is relatively safe and easy to perform under direct ultrasound guidance. The application of local anesthetic in the serratus plane block to the intercostal nerves as they become the lateral cutaneous and anterior cutaneous branches of the intercostal (T1-T11) and subcostal (T12) nerves. These branches innervate the anterior abdominal wall and in particular, the branches of T7-T10 innervate the subcostal and upper abdominal regions. (Figure 2)

REFERENCES