Continuous Rectus Sheath Block And Opioid Sparing Anesthesia For Aortobifemoral Bypass Grafting: A Case Report

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Figures

Fig 1: Staged photograph showing transducer and needle position during rectus sheath catheter placement.

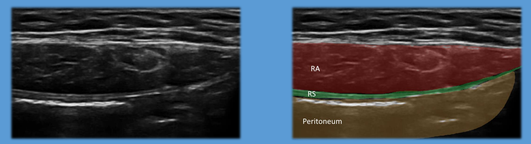

Fig 2a: Ultrasound image illustrating anatomy before rectus sheath catheter placement. Fig 2b. Same illustration with color overlay and labeled structures

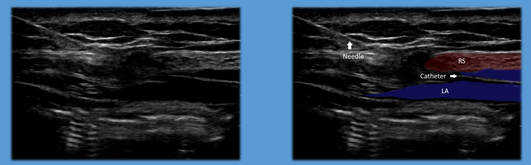

Fig 2a: Ultrasound image illustrating anatomy after rectus sheath catheter placement. Fig 2b. Same illustration with color overlay and labeled structures

Introduction

Surgical bypass grafting is a common treatment for aortoiliac occlusive disease with bilateral or diffuse lesions. This procedure involves a large midline incision which is often the source of significant pain in the postoperative period. This pain can slow recovery and place patients at increased risk for pulmonary (atelectasis, splinting, pneumonia) and cardiovascular (tachycardia, increased oxygen consumption, cardiac events) complications. When opioid analgesics are utilized for pain management, there is a dose-dependent increased risk of side effects that hinder recovery efforts (sedation, GI disturbances, impaired respiratory function). As a result, multimodal analgesic plans utilizing a regional technique offer a great advantage to patients undergoing these major surgeries.

In this case report, we describe the success in managing a patients pain during their post-operative recovery in the hospital after an aortobifemoral bypass grafting. By utilizing a multimodal approach including a continuous rectus sheath block, we achieved robust pain control and high patient satisfaction. Written consent for publication of non-identifying medical information and Health Insurance Portability and Accountability Act was obtained from the patient.

Case Description

A 66 year old male with a medical history of carotid artery stenosis, multiple CVAs, coronary artery disease, COPD, hypertension, and distal aortic atherosclerosis with occlusion and claudication underwent a scheduled placement of an aortobifemoral bypass graft. Pre-operative imaging demonstrated significant atherosclerotic occlusion of the infra-renal aorta with severe disease extending into the bilateral iliac arteries.

General anesthesia was induced with propofol 2.0 mg/kg, fentanyl 1.0 mg/kg, and rocuronium 0.7mg/kg. Maintenance of general anesthesia was achieved with sevoflurane and rocuronium dosed appropriately under guidance of twitch monitoring. Throughout the 6.8 hour case the patient received a total of fentanyl 250 mcg, hydromorphone 1.6 mg, ketamine 40 mg. At the conclusion of the case prior to emergence and extubation, bilateral rectus sheath catheters were placed under ultrasound guidance. The patient was subsequently extubated and transferred directly to the intensive care unit for neurovascular monitoring and further resuscitation.

Case Description (continued)

The patient remained hospitalized for the next five days. He was ambulatory POD 1. His hospital course was complicated by leukocytosis and acute kidney injury. He developed an ileus requiring a nasogastric tube for two days. On POD 5 upon resolution of the above issues, his rectus sheath catheters were removed and he was discharged back to his assisted living facility.

Throughout his stay, the patient received a continuous infusion of ropivacaine 0.25% bilaterally through his rectus sheath catheters at a rate of 6 mL/hour. His pain scores were assessed once daily by our anesthesia providers, and multiple times throughout the day by his nursing staff. He was given additional boluses of 10 mL per catheter once per day in accordance with our service's protocols. In addition, he was scheduled for and received acetaminophen 975 mg every 6 hours.

The patient's pain scores and opioid consumption can be seen below:

Postop Day	Pain Scores	Opioid Consumption	Morphine Milligram Equivalents	Cumulative MME
0	0	None	0	0
1	0, 0, 0	None	0	0
2	0, 0, 0, 0	None	0	0
3	0, 0, 0, 2	None	0	0
4	0, 0, 0, 3	None	0	0
5	0, 3	None	0	0

As shown in the table above, the patient required no narcotics or other as-needed analgesics for break through pain during the hospitalization. Upon discharge, the patient was very pleased with the lack of pain experienced during his recovery.

Discussion

In this case report, we describe the successful use of regional anesthesia with continuous rectus sheath blocks (RSBs) to provide an opioid sparing recovery for a patient who underwent aortobifemoral bypass grafting. RSBs are an effective technique for providing postoperative abdominal wall analgesia. RSBs provide analgesia for abdominal surgeries by blocking the thoracolumbar nerves as they travel through the rectus abdominis muscle. Single shots may be performed for abdominal surgeries with smaller incisions and faster recovery times, but continuous infusions through a RSB catheter offer longer lasting analgesia for recoveries spanning multiple days.

While rectus sheath blocks are unable to provide complete anesthesia for major abdominal surgeries due to their restrictions to midline incisions and sparing of visceral analgesia, they contribute to a substantial benefit when used with multimodal analgesia. In combination with other truncal blocks and pharmacologic medications such as NSAIDs, acetaminophen, and gabapentinoids, RSBs can provide the foundation of a well balanced multimodal pain control plan after major abdominal surgeries like aortofemoral bypass grafting As we saw in this case, the combination of the continuous rectus sheath blocks with scheduled acetaminophen was effective enough to completely eliminate any need for post-operative opioids.

Continuous RSBs are an available option in the setting of thoracic epidural contraindication. The sympathectomy and hypotension that can accompany thoracic epidural infusions is not a concern with continuous RSBs. In the patient presented here, the post-operative hypotension and pressor requirements would have likely led to any epidural anesthesia being held or under-dosed, resulting in increased pain and potentially delayed recover efforts. However, due to the well-tolerated nature of RSB infusions, our patient was able to maintain his infusion rates and have adequate pain control throughout his hospital stay.

References

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