

Management of Complex Resection of Left Shoulder Chondrosarcoma Using a Combined Epidural and Continuous Nerve Block Catheter Approach

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INTRODUCTION	INTRAOPERATIVE COURSE	POSTOPERATIVE COURSE AND DISCUSSION
- Primary and metastatic bone malignancies are not uncommon in adults, but there have been relatively few discussions in the literature regarding anesthetic management of orthopedic oncologic surgeries (1). - Chondrosarcoma is the most common bone sarcoma in adults, with an incidence of 8 per million people, mostly affecting patients greater than age 50 (1). - These cases can be particularly challenging due to complexity, case length, positioning, minimizing blood loss, and coordinating effective analgesic plans. - For tumor resection of the upper extremity, a combination of brachial plexus nerve block as well as an indwelling nerve catheter provides excellent surgical anesthesia and postoperative analgesia (1).	- After proceeding to the operating room, the patient received sedation with intravenous midazolam and fentanyl. A T4 thoracic epidural was placed with a 9cm length 17G Tuohy needle, loss of resistance confirmed with saline, and a 19G catheter threaded to a depth of 12cm. General anesthesia was induced and the patient was intubated, a 7 Fr bronchial blocker was placed in the right main bronchus, a right radial arterial line placed, and a right internal jugular central line was placed. - A foley catheter was placed. Cefazolin was given for antibiotic prophylaxis and subcutaneous heparin was given for perioperative thromboprophylaxis. The patient was positioned supine, with the right arm tucked, and a shoulder roll placed. One-lung ventilation was started. - Dissection extended from the right sternoclavicular joint to the first rib. During this extensive dissection, bupivacaine 0.125% boluses and a 6 mL/hr infusion of 0.125% bupivacaine with 2 mcg/mL of fentanyl were given via thoracic epidural for analgesia. - The drapes were removed and the patient was repositioned into the right lateral decubitus position. A large fasciocutaneous flap was performed. The left subclavian vessels were ligated and 2 units of packed red blood cells, 5% albumin, calcium chloride, and a phenylephrine infusion were given for resuscitation. - The drapes were removed and the patient was repositioned to be supine, with a shoulder roll and the right arm tucked. The right clavicle was fixed to the remnant sternum with a plate. A chest tube was placed. A nerve block catheter was placed by the surgical team in the open surgical field in a retrograde manner, so the tip ended at the transected brachial plexus. A chest wall reconstruction was performed.	POSTOPERATIVE COURSE - The patient left the operating room intubated and was transferred to the surgical intensive care unit in stable condition. Ropivacaine 0.2% at 6 mL/hr was started via the nerve block catheter and the epidural infusion was continued at the intraoperative rate of 6 mL/hr, - No post-operative opioids required. Pain scores were between 0/10 to 2/10. - The patient was weaned to pressure support ventilation over the first 24 hours and extubated to high flow nasal cannula on postoperative day 2. - The epidural was removed on post-operative day 6 and the nerve block catheter was removed on post-operative day 7. DISCUSSION - Orthopedic oncologic surgeries can be particularly challenging for anesthetic management due to case complexity, length, positioning, blood loss and management of post-operative pain (1). Intraoperative boluses and infusion via the thoracic epidural contributed significantly to analgesia while not compromising hemodynamic stability - Epidural infusion has been shown to provide superior postoperative pain control compared to intravenous patient-controlled analgesia (2). Postoperatively, the epidural infusion and peripheral nerve block catheter infusion provided effective analgesia for over a week postoperatively.
CASE PRESENTATION - The patient was a 63-year-old female with a past medical history of hypertension, chronic kidney disease (stage 3a) and anemia, with a rapidly growing left shoulder chondrosarcomatous malignant neoplasm, with additional smaller masses in the third costal cartilage and at the top of the left axilla, extending into the chest wall. - The patient received a biopsy that confirmed a low-grade chondrosarcoma, and given its rapid growth and extensive anatomic malignancy, presented for left forequarter amputation with resection of the involved sternum and anterior left ribs - In the pre-operative area, the patient received an ultrasound guided single shot left sided interscalene block, with injection of 20 mL of bupivacaine 0.5%.	 Figure 1: Preoperative 20 x 18 cm mass in the anterior left shoulder with extension into the medial aspect of the axilla and anterior sternum.  Figure 2: CTA of the left upper extremity with known large soft tissue mass in the left chest wall with extension to the left upper extremity.	
REFERENCES - Anderson MR, Anesthesia for patients undergoing orthopedic oncologic surgery. Journal of Clinical Anesthesia 2010; 22:565-572. - Weinbroum AA, Superiority of postoperative epidural over intravenous patient-controlled analgesia in orthopedic oncologic patients. Surgery 2005;138(5):869-76.		