International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Emergency Open Appendectomy Under Continuous Lumbar Epidural Anesthesia in A Patient with Massive Ameloblastoma

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Abstract

Background: Open appendectomy is still performed in the Philippines. The choice of anesthetic technique should tailor the patient's profile and the disease's extent. This case presents a unique scenario involving a patient with a known case of ameloblastoma, complicating her anesthetic management Method**:** A 29-year-old female presented with migratory abdominal pain associated with symptoms of acute appendicitis. She was scheduled for an emergency open appendectomy under continuous lumbar epidural anesthesia, selected for its advantage in providing reliable surgical anesthesia in a probable prolonged surgery. Result**:** Epidural anesthesia provided adequate sensorimotor blockade during the three-hour surgery. Patient had an uneventful postoperative course and was discharged two days after the operation. This case presents the need for tailored anesthetic approaches in managing patients with unique medical histories undergoing common surgical procedures. These findings contribute to the limited studies on open appendectomy under continuous lumbar epidural anesthesia in a patient with massive ameloblastoma.

Keywords: Appendicitis; Open Appendectomy; Ameloblastoma; Epidural Anesthesia

Introduction

Appendicitis is one of the most common causes of acute abdominal pain, with a lifetime risk of 8.6% for males and 6.7% for females[1]. This condition, particularly common among young adults, involves a pathophysiologic role characterized by abundant lymphoid aggregates in the appendix. This may result from fecaliths, lymphoid hyperplasia, foreign bodies, parasites, and by both primary and metastatic tumors[2]. It requires timely treatment to avoid complications like perforation and sepsis, which can significantly increase morbidity and prolong hospital stays[3]. The definitive treatment for appendicitis is surgical removal of the appendix, either by open or laparoscopic appendectomy[4].

Appendicitis is often identified by symptoms such as periumbilical pain, nausea, and fever, and is diagnosed through clinical examination or imaging techniques like ultrasound or CT scan[5]. While both open and laparoscopic techniques are safe and effective, the laparoscopic approach, despite being more costly, is associated with shorter hospital stays, lower wound infection rates, decreased need for postoperative analgesia, and faster return to daily activities[4].

Open appendectomy is still commonly performed in resource-limited countries, such as the Philippines, where access to laparoscopic equipment may be limited. Open appendectomy can be performed under various anesthetic techniques, such as general or regional anesthesia, depending on the profile of the

patient and the severity of the disease. A study by Gabriel *et al*. shows that open appendectomy under regional anesthesia RA, provides effective pain control and is associated with shorter hospital stays compared to general anesthesia[6]. Regional anesthesia may be advantageous in patients with complex conditions, such as those with airway abnormalities or relative contraindications for airway manipulation. Meanwhile, Kusakai *et al*. performed open appendectomy under epidural anesthesia (EA) to avoid airway manipulation and the use of invasive mechanical ventilation[7].

Patients diagnosed with advanced cases of ameloblastoma may have a difficult airway; hence, initial avoidance of airway manipulation was preferred. Ameloblastoma is a slow-growing, locally invasive tumor arising from odontogenic epithelium in the mandible and maxilla[8]. In advanced cases, ameloblastoma can lead to airway obstruction, complicating bag-mask ventilation and intubation[9]. While both anesthetic procedures were effective, EA is an excellent choice for surgical anesthesia when considering the duration of the operation.

Case Description

Patient Information

In 2023, a Patient RM, 29-year-old female, American Society of Anesthesiologists (ASA) physical status 2E (tumor), presented with a one-day history of migratory right lower quadrant pain associated with nausea and vomiting. She reported no fever, dysuria, vaginal bleeding, or other associated symptoms.

The patient is also a known case of ameloblastoma (Figure 1), presenting with an 8-year history of a gradually enlarging, non-painful, non-tender left mandibular mass, associated with drooling and occasional dysphagia to solid food. She has no facial allodynia, hyperesthesia, or other symptoms reported. There are no known comorbidities such as hypertension, diabetes, or asthma. The patient has no previous surgeries or hospitalizations. Her past social history and family history are also unremarkable.

Figure 1. An ameloblastoma measuring 13 x 16 x 13 cm is present in the left mandible of patient RM. [LM] left mandible

Clinical Examination

Upon examination, the abdomen is non-distended and soft but exhibits direct and rebound tenderness in the right lower quadrant area. There is no guarding or other signs or symptoms of peritonitis. The patient appears to have a difficult airway due to a 13 x 16 x 13 cm fixed, firm, non-tender mass at the left mandible displacing the tongue to the right. Limited mouth opening (< 3 cm) was also noted, which makes the Mallampati assessment inaccurate. The rest of the airway examinations were unremarkable: thyromental distance is more than 6.5 cm, Bellhouse Dore grade 1, and no anterior neck mass. Back examination was unremarkable, with no gross back deformities and the spine midline with a palpable spinous process.

Diagnostic Workup

A diagnosis of acute appendicitis was established clinically. Pregnancy was ruled out with a negative urine hCG test. A transvaginal ultrasound was also done with unremarkable results; hence, the patient was cleared by the obstetrics and gynecology service. Flexible laryngoscopy was performed by the otorhinolaryngology service, showing no mass obstructing the laryngeal complex and fully mobile vocal cords.

Anesthetic Procedure

The patient was referred to the anesthesiology service for laparotomy and appendectomy, with an anesthetic plan of continuous lumbar EA. Upon arrival at the operating room, the patient was attached to the ASA standard monitoring: non-invasive blood pressure measurement, five-lead electrocardiogram, and a pulse oximeter. A 20-gauge intravenous line had already been placed, and patency was confirmed. Baseline vital signs were as follows: 95/60 mmHg, 115 bpm, 18 cycles/min, and 100% oxygen saturation at room air. Oxygen supplementation at 6 l/min was provided *via* facemask. Sedative-hypnotics were avoided perioperatively to reduce the risk of airway compromise.

All necessary equipment was prepared, including the difficult airway setup: fiberoptic laryngoscope, lidocaine spray, and remifentanil infusion. The patient was positioned in the left lateral decubitus position, and her back was prepared and sanitized using 10% povidone-iodine solution, starting from the inferior border of the scapula down to the posterior superior iliac spine. The povidone-iodine was allowed to contact the skin for a minute before being wiped off with sterile gauze. The Tuohy needle (G18) was inserted between L4 and L5, and the epidural catheter was threaded with 4 cm indwelling in one attempt using the loss of resistance to air (LORTA) technique. No dural puncture or other difficulties were encountered during induction. Surgical anesthesia with 20 cc of Lidocaine 20 mg/ml + Epinephrine 5 mcg/ml was given in increments after a negative test dose, showing no increase in heart rate or blood pressure. The dermatomal level of EA was assessed with pinprick, cold sensation, and pain. Surgery was initiated when the target block height of T4 was achieved. No anxiolytics or sedatives were given intraoperatively. The patient was reassured about the procedure to prevent any signs of anxiety. The total operation time was 3 hrs, with blood loss of 150 cc and adequate urine output at 1.1 cc/kg/hr. The epidural catheter was removed after surgery.

Postoperative Care

In the post-anesthesia care unit (PACU), the patient was seen awake, comfortable, with stable vital signs, and adequate pain control. After two hours of monitoring, she was eventually discharged from the PACU with a modified Bromage scale of 0 and a Richmond Agitation-Sedation Scale of 0. Paracetamol, ketorolac, and tramadol were prescribed as postoperative pain medications.

The patient had an unremarkable course in the ward postoperatively. Vital signs were stable, with adequate postoperative pain control (Numerical Rating Scale: 0/10). The patient denied nausea and vomiting, new-

onset neurological deficits, or other subjective complaints. The return of spontaneous bowel movement was observed the day after surgery. The patient was sent home two days postoperatively and was advised to have an elective admission for the definitive management of ameloblastoma.

Discussion

Open appendectomy, unless otherwise with contraindication, is usually done under spinal anesthesia (SA) due to its rapid onset of action, and dense sensorimotor blockade. However in a training institution where surgeries can be unexpectedly prolonged and might require a shift in anesthetic technique, SA was dismissed for this patient.

Combined spinal-epidural anesthesia (CSEA) was also considered; however with this technique, the functionality and reliability of the EA cannot be properly assessed once SA is administered. This case was performed under EA due to the unpredictable duration of surgery in a training institution. For this case, which lasted three hours (Appendix A), EA has the advantage of providing adequate surgical anesthesia duration (> 2hrs) without manipulating the airway.

This case report is specifically applicable to patients with a difficult airway, such as those with ameloblastoma, undergoing open appendectomy, and not laparoscopic appendectomy. Further research is needed to develop comprehensive guidelines for anesthesia management in patients with similar conditions to improve outcomes and enhance safety.

Conclusion

Despite the limited studies on open appendectomy under EA, this case report demonstrates that EA is an appropriate choice for patients with difficult airway undergoing emergency open appendectomy with an unpredictable duration of surgery.

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