CASE REPORT

Anesthetic management for removal of a huge intra-abdominal tumor: A case report

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ABSTRACT

Large ovarian tumors are not very uncommon in rural India and developing countries, due to delayed reporting by the patients to the scarce healthcare facilities available, hence anesthesiologists must be aware of the anesthetic challenges that one may have to face in these cases. We report perioperative anesthetic management for a large ovarian tumor which was successfully removed. The tumor weighed 32 kg with a fluid volume of 15 lit.

Key words: Large ovarian tumor; General anesthesia; Supine hypotension; Re-expansion pulmonary edema

Citation: Tamaskar A, Bhargava S, Dave SP, Shidhaye RV. Anesthetic management for removal of a huge intra-abdominal tumor: A case report. Anaesth Pain & Intensive Care 2014;18(3):296-298

INTRODUCTION

Giant ovarian tumors have become uncommon in contemporary medical practice, since patients now present earlier for medical care. However, patients residing in rural areas continue to seek medical aid very late for conditions which are insidious in onset and do not cause any acute symptoms to the patient. Hence, patients tend to present only when the primary condition has advanced significantly and has started causing symptoms. These patients are considered at greater risk of perioperative complications and require meticulous anesthetic management. We report the anesthetic management of a patient having huge intraabdominal ovarian tumor weighing 32 kg and containing 15 l of fluid posted for surgical resection. We are presenting this case since this kind of 'late presentation' for ovarian cyst is still common in rural India and other developing countries and management of such 'advanced' cases is challenging and associated with appreciable morbidity.

CASE REPORT

A 65-year-old woman presented with abdominal distension of three years duration, generalized weakness and diminished appetite. She had no significant medical history. Oxygen saturation on room air was 94–96% in a semi recumbent position. Preoperative pulmonary function tests indicated restrictive impairment [vital capacity (VC): 1910 ml (%VC: 77.3%); forced expiratory volume in 1 second (FEV1.0): 1440 ml (%FEV1.0: 75.4%)]. Tumor markers were within normal ranges. Chest X-ray revealed elevation of the bilateral diaphragm and abdominal computed tomography revealed a large ovarian tumor. Evidence of malignant tumor, atelectasis, and pleural effusion was not observed. To facilitate precise hemodynamic control, standard monitors (pulse oximeter, ECG monitor, and capnogram) were applied and a central line was inserted.

Figure 1: Huge ovarian tumor

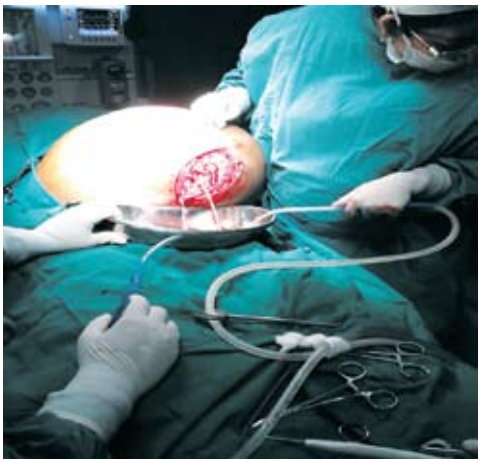

Figure 2: Slow drainage of ovarian tumor fluid

After preoxygenation with 100 percent oxygen the patient was induced with 0.2 mg of glycopyrrolate, 1 mg midazolam, ketamine 50 mg, and succinyl choline 75 mg, the trachea was intubated in lateral position. Anesthesia was then maintained with 1.5% sevoflurane and fentanyl 50 mcg and atracurium 30 mg.

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Patient was maintained on controlled ventilation with positive end-expiratory pressure (PEEP) set at 5 cmH_2O with pressure support set at 17 cmH_2O above PEEP. A catheter was placed in the right internal jugular vein under ultrasound guidance to monitor central venous pressure (CVP) and administer inotropic agents. Surgery commenced in the semi recumbent position to prevent supine hypotensive syndrome and respiratory failure. The incision site was infiltrated with 20 ml of 0.75% ropivacaine, and the tumor fluid was extracted at a rate of 500 ml/min. Draining the tumor fluid improved respiratory compliance; therefore, we decreased the pressure support to 11 cmH2O.

A total of 15 L of fluid was gradually aspirated from the ovarian cyst. The patient was then moved into a supine position. Residual tumor resection and bilateral salpingo-oophorectomy were performed. At the end of the procedure surgical wound was further infiltrated with ropivacaine 0.25% and postoperative analgesia included inj. tramadol 50 mg IM 8 hourly and diclofenac 75 mg IM 8 hourly. The patient was extubated after surgery after reversal of neuromuscular block with neostigmine and glycopyrrolate. Her respiratory status was good thereafter. The final pathology diagnosis of the extracted tumor was benign ovarian cyst.

DISCUSSION

Huge intra-abdominal tumors posted for surgical resection pose great anesthetic challenges. Before the tumor is removed, supine hypertensive syndrome and ventilatory failure can be induced by compression of the tumor. A rapid decrease in thoracic pressure after removal of giant ovarian tumors can cause hemodynamic collapse and re-expansion pulmonary edema. If the ovarian tumor is benign and cystic, it has been previously reported that slow aspiration of the cystic tumor fluid before surgical resection was effective to prevent such complications.[1,2] Slow aspiration of cystic tumor fluid before ovarian resection cannot be done when the tumor is entirely solid or if malignancy is suspected, because a puncture in such cases could cause dissemination of malignant cells. In our case, the tumor was cystic with no evidence of malignancy on tumor markers and abdominal CT, which allowed us to proceed with fluid aspiration as our initial step in tumor removal. We selected general anesthesia during the fluid-extraction procedure. Because of the large tumor size, there was a high risk of hemodynamic collapse and re-expansion pulmonary edema even after fluid extraction and these complications would have made emergency airway maintenance difficult. There have been reports of similar cases performed using epidural anesthesia,[1,2] for the fluid-extraction procedure. However, we avoided epidural anesthesia in this case for the following reasons: 1) high risk of epidural hematoma formation because of dilatation of the epidural venous plexus; 2) potential technical difficulties due to increased internal epidural pressure; and 3) potential hemodynamic instability associated with administration of local anesthetics into the epidural space. Anesthesia was maintained with controlled ventilation with PEEP which prevented hypoxemia and hypercapnia. We believed that gradual fluid extraction would effectively prevent re-expansion pulmonary edema. Re-expansion pulmonary edema is a non-cardiogenic pulmonary edema caused by rapid expansion of the lungs after long-term collapse and the risk factors include lung collapse over a period of 3 or more days, or evacuation volume of 2000 ml or more. The onset is rapid, usually within 1 hr after re-expansion of the lung,[3] and there is no consensus with respect to an ideal extraction rate for preventing re-expansion pulmonary edema in a patient with a cystic ovarian tumor. In previous reports, extraction rates of 44.3 L in 2 hr (22.2 L/hr)[3], or 11 L in 20 min (33 L/hr)[2] prevented re-expansion pulmonary edema. In our case, the drainage rate of 500 ml/min (30 L/h) did not cause re-expansion pulmonary edema. We believed that this rate was reasonable based on previous reports. Also, although the chest X-ray in our patient showed an elevation in the bilateral diaphragm, the CT images indicated no atelectasis, a result of anteroposterior and lateral expansion of the thoracic cavity. The absence of preoperative lung collapse was likely another factor preventing re-expansion pulmonary edema in this case. The gradual removal of cystic tumor fluid, and CVP monitoring provided stable hemodynamic management during surgery. Local anesthetic infiltration minimized

the administration of post-operative analgesics. Thus we could manage this case uneventfully due to precise diagnosis of the type of tumor, a thorough history and pre-operative evaluation, investigations, and anticipation of various potential challenges associated with anesthetic management.

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