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Case Report

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Anesthetic management of a giant uterine fibroid tumor.

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Abstract

Uterine fibroid tumors are noncancerous growths in the uterus, fibroids >50 cm2 in size, are defined as giant and rare. The following case report presents an unusual and challenging case of a 41-year-old female with a solid abdominopelvic mass depending on the uterine cavity with abnormal morphology was detected with an MRI and measured 38x32x29 cm approximately.

The anesthesia plan was a combined anesthesia (general anesthesia + epidural catheter for postoperative pain control) + Invasive blood pressure monitoring + awake intubation with a video laryngoscope (CMAC) due to predicted difficult airway.

Giant abdominal tumors in obese patients have important anesthethic considerations that may impact positively on the patient outcome. There is few literature available, for this reason we report this clinical case and describe all the anesthethic considerations that should be taken in this kind of surgery.

Background

Uterine fibroids are benign neoplasms of the myometrium, representing the most common tumors in women worldwide. Uterine fibroid tumors are noncancerous growths in the uterus, frequently found in women between ages 30–45 years. [1,2]

Although uterine leiomyomas are frequent in women, fibroids > 50 cm2 in size, are defined as *giant* and rare. Abdominal myomectomy is the surgical procedure of choice in these cases, nevertheless, Patients with giant ovarian tumors are considered at greater risk of perioperative complications and require meticulous anesthetic management, this procedure is associated with a large degree of blood loss and this increases the need for perioperative blood transfusion. A rapid decrease in thoracic pressure after removal of giant ovarian tumors can cause hemodynamic collapse and re-expansion pulmonary edema. For this reason general anesthesia is the anesthetic technique of choice in giant uterine tumors. [3–5]

Large uterine fibroids may cause Intra-abdominal hypertension (IAH) which is defined as a sustained increase in intra-abdominal pressure (IAP) equal to or above 12 mmHg. IAH is associated with increased morbidity and mortality IAH directly impacts the organ function of the abdominal organs such as the kidney and liver. Furthermore, IAH can affect the function of organs outside the abdominal cavity including the brain, the cardiovascular system, and the lungs. [6,7]

IAH affects mainly respiratory mechanics and oxygenation, causing a cephalad shift of the diaphragm thereby increasing intra-thoracic pressures and reducing chest wall compliance and lung volumes.[8,9]

Considering these pathological changes in the respiratory system, airway management in this group of patients can be classified as a difficult physiological airway, in which physiologic derangements of the patient increase the risk of cardiovascular or respiratory collapse.[10,11]

In this report, we provide the clinical information and perioperative anesthetic management of a patient with a giant uterine fibroid tumor.

Case presentation

A 41-year-old female patient presented with a history of increased abdominal circumference and associated gastrointestinal discomfort, along with excruciating pain. She sought medical attention at the emergency department, where magnetic resonance imaging, complemented by a tomography, reported a solid abdominopelvic mass arising from the uterus with loss of normal morphology. The lesion had maximum dimensions of 38x32x29 cm and caused an eccentric mass effect. Additionally, a 10 cm umbilical hernia was noted.

The physical exam reported: a conscious, awake, cooperative patient, cardiopulmonary exploration without relevant findings, the abdominal examination revealed an intra-abdominal mass occupying the hypogastrium and the umbilical region extending into the iliac and lumbar area bilaterally. It was possible to move horizontally, but no movement was possible in the craniocaudal direction. It was firm and non-tender, and palpable per vaginal examination. External genitalia were normal. Extremities had adequate muscular strength and movement, Osteotendinous reflexes were conserved. The patient's height was 165 cm and she weighed 100 kg.

MRI reported a solid abdominopelvic lesión of maximum dimensions of 38x32x29 cm that caused an eccentric mass effect.

The patient was programmed for an open myomectomy, based on clinical and laboratory testing findings. Anesthetic plan: Combined anesthesia technique (general anesthesia + epidural catheter for postoperative pain control) with invasive monitoring of arterial tension with arterial line placement.

Monitoring: pulse oximetry, invasive arterial pressure with radial arterial line placement, electrocardiogram, capnography, pulse oximetry and plethysmography, spirometry, gas analyzer, and bispectral index.

After monitorization, the patient was placed in the right lateral decubitus position, the L2-L3 lumbar space was identified and an antiseptic solution was used to cleanse the target area with wide margins.

A 22 gauge (g) needle was then used to establish a skin wheel with 2% lidocaine at the target area. Then the 17G Touhy needle was introduced until a positive loss of resistance test (Pitkin test). Upon loss of resistance, the epidural catheter was placed, negative aspiration, and the test dose was administered without complications, Then the patient was repositioned to a supine decubitus position.

Upon the physiological difficulties of the airway, we decided to perform awake intubation with a video laryngoscope (CMAC).

Preoxygenation was performed with a facial mask, FiO2 of 100%, achieving a maximum saturation of 96% and EtO2 >85%.

The patient was sedated with a remifentanil infusion at 0.2 mcg/kg/min, then we proceeded to topicalize the airway with 2% lidocaine spray.

The patient received continuous oxygen via a nasal catheter with a flow of 5 L.min.

Topical anesthesia was supplemented with two puffs of lidocaine 10% metered spray applied directly on the surface of the tongue and oropharynx. Video laryngoscopy was done using an adult D-blade of C-MAC, simultaneously, the posterior pharyngeal wall was anesthetized with two puffs of 10% lidocaine spray to blunt the reflexes during insertion of the endotracheal tube (ETT). The patient was then intubated with a 7.5 mm internal diameter (ID) ETT. After confirmation of the tube placement with a capnography waveform, general anesthesia induction was completed with 100mg of propofol and 50 mg of rocuronium.

Maintenance: mechanical ventilation (PVC-VG) with a tidal volume of 350 ml, a respiratory rate of 10-16, an inspiratory-to-expiratory ratio (I:E) of 1:2, PEEP 8-10, FiO2 of 0.6%, total flow of 2 l/min, sevoflurane, remifentanil infusion as needed at 0.08 mcg/kg/min. Invasive arterial pressure measurement, central venous catheter, and a second intravenous catheter 14G were placed.

After tumor removal (>15 kg) norepinephrine at 0.02- 0.2 mcg/kg/min and vasopressin infusions at 0.02-0.04 U/min were initiated to maintain a mean arterial pressure (MAP) of 70-85. (Fig. 1)

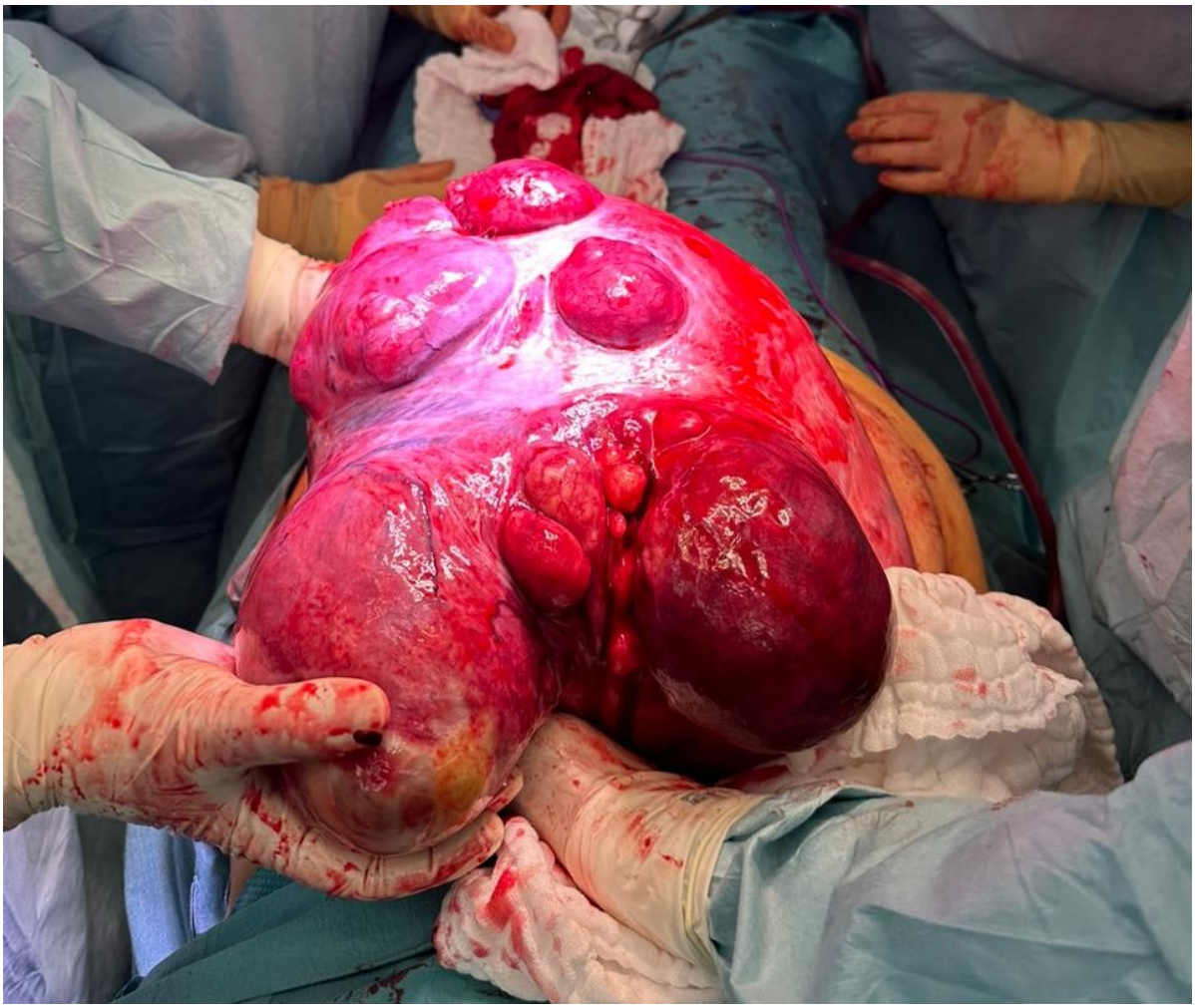
A blood gas analysis showed the following parameters: pH: 7.31, pCO_2: 48 mmHg, HCO_3: 22.1 mmol/L, Hb: 9.5 g/dL, Lactate: 2.24 mmol/L, BE: -2.3. Blood loss was 4,000 ml.

The surgery concluded and taking into account the results of the blood gas and hemodynamic parameters, the patient was transferred to the ICU, under mechanical ventilation and both vasopressor infusions, for continuous monitoring and ventilator weaning.

Intravenous fluids: Balanced solution 6800 ml, 4 units of packed red blood cells (1029 ml) , 2 units of plasma(265 ml).

At 24 hours post-surgery, the patient remained under Invasive mechanical ventilation, sedated with a propofol and fentanyl infusion. titrated to a BIS of 60, RASS -2, hemodynamically, the patient required a norepinephrine and vasopressin infusion to achieve a MAP above 65mmHg.

48 hours postoperatively the patient was weaned from vasopressors, progression of IMV to pressure support ventilation, and was weaned from IMV the next day, without complications. The patient was discharged 3 days later.Written informed consent was obtained from the patient.



Discussion

The anesthetic strategies described in this case, including ramp positioning, awake tracheal intubation, and invasive monitoring are resources described to be fundamental for successful perioperative management in patients with giant abdominal tumors. [10,12,13]

It was expected that our patient would present abdominal hypertension, therefore she was susceptible to rapid hemodynamic variations before, during, and after the resection of the tumor. [9,14,15]

Available literature describes the invasive monitoring of hemodynamics including CVP, Arterial line, and Cardiac Output monitoring to guide fluid administration strategies and requirement of vasoactive drugs if necessary.[3,4,10]

Obese patients are susceptible to desaturation and develop hypoxemia faster when compared to the rest of the population.[4] Even when obesity isn't a risk factor for difficult intubation, obesity has been described as a risk factor for difficult ventilation. Making it a difficult airway by definition.[12,13,15] In critically ill patients, there are physiologic derangements that are considered risk factors that contribute to the "physiologically difficult airway" and are associated with complications including cardiac arrest and death. [10,11,12]

Physiologic derangements predominantly drive these risks with intubation in this population and often precipitate complications despite first attempt success. These pathophysiologic alterations limit the ability to preoxygenate, and maintain oxygenation during intubation, or tolerate the transition to positive pressure ventilation

The four conditions that are included in the physiologically difficult airways include hypoxemia, hypotension, severe metabolic acidosis, and right ventricular failure. The anesthesiology physician should account for these physiologic derangements in airway management situations regardless of the predicted anatomic difficulty of the intubation. Anesthesiologists must focus on managing the heart-lung interactions and the pharmacologic interventions that underpin difficult airway management. [13]

Our patient had a giant ovarian tumor, this condition increases the risk of aspiration due to increased abdominal pressure at the time of anesthesia induction and severe obesity that may cause hypoxemia since this was a physiological and anatomical difficult airway, the best and safest approach was an awake patient intubation, reducing the risk of failed intubation and aspiration. Allowing us a safe transition to positive pressure ventilation, maintaining adequate saturation and hemodynamics at all times. Regarding positive pressure ventilation, several reports have recommended the application of protective lung ventilation with low tidal volumes of 6–8 mL/kg and maximum driving pressure of 15 cmH_2O. Higher than recommended plateau pressures of 30 cmH_2O might be required in the setting of IAH. In patients with IAH, higher PEEP levels might be required to prevent end-expiratory lung collapse. However, the best PEEP determination in the setting of IAH is still unknown. In this case, we used a Dual ventilation mode, considering all the factors that may complicate protective ventilation, monitoring plateau pressure, and driving pressure throughout the surgery.

Anesthetic management of giant abdominal tumors in obese patients has important implications that may impact positively on the patient outcome. To date, case reports and available literature suggest delicate management of the anatomical and physiological difficult airway. Most reports suggest a combination of conscious intubation and HFNC with apneusic oxygenation during the laryngoscopy to prevent hypoxemia and peri-intubation difficulties, Invasive arterial pressure monitoring is required to monitor and respond to hemodynamic changes throughout surgery, tumor aspiration, mechanical ventilation, and circulatory dynamics in obese patients before and after removal of the tumor. [4,9]

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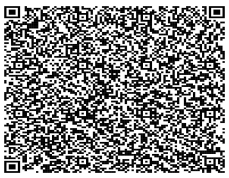	Website: www.ijarm.com
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