

Large Adnexal Tumour in a Young Woman Presenting with Cardiac-related Signs and Symptoms

Thapelo Matlou¹, Leon C Snyman¹, Salome Bothma²

¹ Department Obstetrics & Gynaecology, University of Pretoria and Kalafong Provincial Tertiary Hospital, Pretoria, South Africa

² Department Internal Medicine, University of Pretoria and Kalafong Provincial Tertiary Hospital, Pretoria, South Africa

ABSTRACT

Adnexal tumours constitute a wide range of conditions that are frequently faced in gynecological practice, and this include benign cysts, as well as malignant tumours. Although the majority of ovarian tumours are asymptomatic or have localized symptoms, very large adnexal tumours may have systemic effects because of their size and location. This report describes a rare case of a young woman with a very large adnexal tumour presenting with predominantly cardiovascular-related symptoms. A 21 year old nulligravid woman presented to our emergency department with progressive history abdominal distension, swelling of the lower limbs, and cardiorespiratory distress due to an adnexal tumour noted intra op to be measuring 30 x 40 cm. Initial investigations revealed a tumour originating from the pelvis extending to the epigastrium. Further investigations revealed cardiovascular compromise tumour with an ejection fraction of 43% on echocardiogram. A multidisciplinary team consisting of gynaecological oncologists, physicians and anaesthetists were involved in the management of the patient. Fertility sparing surgery was performed and serial echocardiograms post-operatively showed improvement in the patient's cardiovascular status.

BACKGROUND

Adnexal tumours are a broad spectrum of gynaecologic conditions with the spectrum spanning from benign functional cysts to malignant neoplastic processes. Benign ovarian tumours are usually asymptomatic or have local symptoms like pelvic pain or irregular menstrual cycles. Unusually large adnexal tumours can have varying degrees of systemic effects, owing to pressure symptoms and displacement of vital organs. Cardiovascular compromise can occur via mechanical compression of the inferior vena cava or elevation of the diaphragm and direct pressure on thoracic organs. The resulting physiologic imbalances may take the form of lower limb oedema, decreased cardiac preload, lessened ventricular compliance, and respiratory failure.

The report of this case demonstrates the systemic impact of a very large benign ovarian tumour in a young woman, highlighting the interaction between gynecological disease and cardiovascular physiology. We describe the diagnostic investigations and the importance of multidisciplinary management between gynaecology, internal medicine and anaesthesiology to provide the best possible outcome.

CASE REPORT

A 21 year old nulligravid woman attended the emergency department with a seven-month history of progressive abdominal distension. In addition, she also reported early satiety, increased fatigue, and unintentional weight loss during this time. She had no relevant medical history, prior hospitalisation or surgery, and no family history of malignancy. The patient is a student who is sexually active, and has been using injectable contraceptives as birth control.

On physical examination she appeared cachectic with distinct muscle wasting and loss of subcutaneous fat. Her blood pressure was 151/121 mmHg and her pulse rate was 140 bpm. Her respiratory rate was 24 breaths per minute and her temperature was normal. She had bilateral pitting oedema from her feet extending into the mid-thigh juncture where the indentation was clearly visible.

On cardiovascular examination, she had sinus tachycardia with no added sounds, and no murmurs, rubs or gallops could be heard. The assessment of her respiratory system revealed

the presence of increase effort of breathing accompanied by the use of accessory muscles and intercostal retractions. She had decreased lung sounds with absence of any abnormal sounds. On abdominal examination she had massive distension, which was tense and dull nature with a positive fluid thrill indicating ascites. Her pelvic examination was otherwise unremarkable.

Ultrasound examination revealed a very large cyst filling the whole abdomen extending up from the pelvis to the epigastrium. On chest X-Ray she had an increased cardio-thoracic ratio with severe compressions over the mediastinum, tracheal deviation to the left, and bilateral basal consolidation of the lungs indicative of atelectasis. Echocardiography showed partially impaired left ventricular performance with an ejection fraction of 43 %, moderately extensive circumferential pericardial effusion, the deepest portion of which was 1.5 cm with no features of a tamponade and raised pulmonary pressures of 37mmHg. Since there was no tamponade imminent, decision was made to not drain the effusion, as this is an invasive, highly technical procedure with risk for infection.

The origin of the tumour was not clearly delineated on ultrasound examination due to the huge size of the cyst. Contrast-enhanced computed tomography (CT) of the abdomen and pelvis showed a unilocular cyst measuring approximately 27 cm x 30 cm x 40 cm originating from the right ovary with bilateral hydronephrosis due to ureteral compression. In addition, there were also compression of the lung fields and a pressure effect on the right atrium. The pelvis had evidence of free fluid, compatible with ascites. A CT pulmonary angiogram, done to rule out possible pulmonary embolism due to respiratory distress, showed no thromboembolic disease.

Other special investigations showed a mild normocytic anaemia with a haemoglobin of 10 g/dL and haematocrit of 29.3%. Renal function was normal with creatinine of 61µmol/l and urea of 8.2 mmol/l in spite of bilateral hydronephrosis. Her liver function tests were normal with a albumin of 35 g/dl. Her lactate dehydrogenase (LDH) level was mildly elevated at 298 U/L (140-280 U/L), alpha-fetoprotein level was normal at 5.2 ng/mL, beta-human chorionic gonadotropin was undetectable and cancer antigen 125 (Ca-125) was only slightly elevated at 47 U/mL (0-35 U/ml).

Initial medical management included intravenous

furosemide 40 mg q12h to treat the volume overload and the peripheral oedema, and carvedilol 3.125mg q12h to manage the tachycardia. Oxygen was administered through a nasal cannula to supplement the oxygen supply. The patient was initiated on a high protein diet and additionally, supplemented with thiamine and multivitamins.

After the patient's condition was optimised, a midline laparotomy was performed. On peritoneal entry, about 500 mL of clear ascitic fluid was drained and sent for cytology. The very large cyst measuring 30 x 40 cm was discovered to have originated from the right ovary, and a right-sided adnexectomy and omentectomy was done. The cyst was removed intact.

The patient was admitted postoperatively to the high-care unit. Her postoperative stay in the unit was largely uneventful and she was transferred to the ward after two days.

Final pathology of the ovary revealed a mucinous cyst adenoma. Serial echocardiogram examinations post-operatively showed gradual improvement of the cardiac activity in the subsequent months. Six months post operatively the patient had EF of 61% . Subjectively the patient also reported significant improvement of her dyspnoea.

DISCUSSION

Large adnexal tumours, typically defined in the published literature as measuring more than 10 cm are rare.¹ These tumours can create a pressure effect that can cause severe cardiovascular and respiratory complications. Very large tumours can compress the inferior vena cava (IVC), resulting in diminished blood flow blood back to the heart. This leads to high venous pressure at the lower extremity level causing bilateral oedema.² This can also result in venous thrombosis in some cases. The low venous return or lack of preload, lowers blood flow leading to poor systemic circulation and delivery of oxygen to the vital body organs which may result in fatigue, low blood pressures and organ failure.

Moreover, the pressure effect by the tumour elevates intra-abdominal pressure (IAP) moving the diaphragm upwards.² This limits lung expansion and decreases functional residual capacity and can cause dyspnoea and atelectasis. The high IAP causes an increase in intrathoracic pressure and has the effect of applying external pressure on the heart. The consequence of this is a decrease in ventricular compliance and diminished diastolic filling affecting haemodynamic stability. In severe cases, abdominal compartment syndrome can develop.

Compression-related symptoms that can be experienced, include symptoms of heart failure such as dyspnoea, orthopnoea, oedema and generalised fatigue.

Preoperative planning is essential in the management of these cases. Cardiac function optimisation, fluid, electrolyte and nutritional support, are also important. Potential circulatory system complications may arise from hypotension syndrome caused by compression of major blood vessels by the tumour when the patient is in the supine position.³ Tumour removal can lead to a decrease in intrathoracic and intracavitary pressure, resulting in hemodynamic instability. To mitigate this risk, slow intraoperative drainage at a rate of 0.5–1 litre per minute is recommended.⁴

Because of the considerable physiologic changes that surround the removal of very large ovarian tumours, postoperative care of the patients should be done in an intensive or high-care unit.³ Having continuous cardiopulmonary monitoring is important to identify any arrhythmias or changes in the respiratory condition. Sequential monitoring of renal function will facilitate early detection of possible acute kidney injury. Appropriate post-operative surveillance enables early action in the event of any

haemodynamic instability leading to a significant reduction in morbidity and mortality and maximising the recovery.

Although very large ovarian tumours with systemic cardiovascular impact are uncommon, some cases have appeared in the medical literature, mainly as case reports. All these reports do reveal that huge adnexal tumours are capable of exerting significant mechanical compression of vital structures, which can induce cardiopulmonary compromise due to multiple physiological processes such as IVC blockage, diaphragmatic elevation, and direct cardiac compression.² The supporting literature is entrenched with the fact that total surgical resection is likely to lead to a quick resolution of such mechanical effects with the majority of the patients experiencing marked improvement in their respiratory and cardiac performance after the procedure.

CONCLUSION

This case illustrates the rare but serious complications which may develop as a consequence of a very large adnexal tumour. These tumours are typically benign in most cases, but compression on neighbouring anatomical structures can adversely affect other organ systems including the cardiovascular system. The key to successful outcomes includes a multidisciplinary approach and meticulous management of the perioperative care. The knowledge base of these cases are mostly presented as case reports or miniseries, which makes it difficult to base clinical decisions on available research.

KEY POINTS:

1. Systemic Effects: The presence of huge tumours can impede the IVC (leading to oedema) and the heart (which loses preload/compliance) and also interfere with respiration due to displacement of the diaphragm.
2. Multidisciplinary care: In the case of the patient, the cooperation of cardiology, critical care, and gynaecology was critical toward perioperative stability.
3. This case also highlights the importance of appropriate referral to a tertiary centre, as these patients should not be managed as part of a multidisciplinary team.
4. Surgical precaution and anaesthetic expertise, anticipating a sudden drop in blood pressure: Haemodynamic collapse as a result of sudden decompression should be avoided by controlled removal of the tumour.
5. Outcome: excision of the tumour corrected cardiac dysfunction, which shows the importance of initial treatment of giant tumours in symptomatic cases.

The case demonstrates the significant systemic consequences that very large adnexal tumours pose with regard to life and the significance of personalised care that involves team management.

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