CASE REPORT

Anaesthetic technique for ovarian germ cell tumour with acute kidney injury in a young Asian woman

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Abstract

We report a case of mixed germ cell tumour, which presented with acute kidney injury in an unmarried 22-year-old Asian girl. The case demonstrated that an aggressive approach with multidisciplinary teamwork ascertained outstanding clinical outcome. The patient was successfully managed fertility-sparing surgery and three cycles of Bleomycin, Etoposide and Cisplatin (BEP) therapy. The patient's pathophysiology returned to normal within weeks and she was declared tumour-free. Furthermore, three-year follow up scans and biomarkers were evident for tumour negativity.

Keywords: Ovarian germ cell tumour, Acute kidney injury, Nephrotoxic, Bleomycin, General anaesthesia.

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Introduction

Malignant ovarian germ cell tumours (MOGCTs) are a group of tumours commonly seen in adolescent and young females. MOGCTs represents ovarian tumour load of 3-5%[1] higher incidence seen in Asian[2] females (8-19%), as compared to Western females (2-3%). Dysgerminoma comprises 25-35% of all ovarian malignancies. Yolk sac tumour (YST) is the second commonest of all MOGCTs and is usually malignant. The heterogeneous (mixed) pathology represents 10-14.3% of ovarian germ cell tumour.[3] MOGCTs mainly present with unilateral ovarian tumour which allows fertility-sparing surgery.[4] Early disease recognition and platinum-based chemosensitivity therapy have dramatically improved disease cure rate and there is negligible recurrence.[5] Malignancies are known to put stress on renal function by infiltration or obstruction of the urinary tract and by the administration of nephrotoxic chemotherapeutic agents.[6] The prevalence of perioperative acute kidney injury (AKI) is around 13%[7] in non-cardiac surgical patients, which instigated perioperative morbidity and mortality. We report successful anaesthetic management of a young lady, diagnosed with MOGCTs along with obstructive acute kidney injury (AKI), for fertility-sparing surgery (excision of left-sided ovarian germ cell tumour).

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Case Report

A 22-year-old unmarried girl (weight 40 kg and height 155cm) was scheduled for left salpingo-oophorectomy and regional pelvic lymphadenectomy, para-aortic lymph node sampling, partial omentectomy and right ovarian biopsy (fertility-sparing surgery) at Aga Khan University Hospital, Karachi, in April 2016. A routine pre-operative assessment was carried out in anaesthesia clinic. She had no prior known comorbidity; acute complaints were low-grade fever and progressive abdominal distension over six months. Her radiological (Ultrasound and Magnetic Resonance Imaging) findings revealed large abdominal heterogeneous complex mass measuring 103.6 185.6 184.2 mm, that originated from the pelvis and was compressing the uterus, urinary bladder, bowel loops, inferior vena cava (IVC) and aorta. Blood samples were positive for malignancy; other positive findings were haemoglobin at 8.3 gm/dl, creatinine at 3.2 mg/dl and alkaline phosphatase at 598 IU/l. Bone scintigraphy and Computed Tomography of the chest, abdomen and pelvis were negative for metastasis. Pre-operatively, the nephrologist was taken on-board for AKI (obstructive uropathy) and the patient's haemoglobin was optimised by transfusion of two units packed red blood cells. She was labelled ASA grade-III. The patient consented for general anaesthesia, central venous cannulation (CVC) and thoracic epidural for pain management. She was premedicated with oral Midazolam 3.75mg, oral Chloral hydrate 30 ml, intravenous Metoclopramide 10 mg and Ranitidine 50 mg one hour before induction of anaesthesia. Once pre-induction monitoring (ECG, NIBP, peripheral SPO2) was instituted, thoracic epidural at 9-10 intervertebral space was given. General anaesthesia was induced with Propofol 2mg/Kg, Fentanyl 1μg/Kg and Atracurium 0.5 mg/Kg, and the trachea was intubated successfully. In view of the case complexity such as AKI, great vessels involvement, fluid status, inotropic and vasopressors requirement, ultrasound-guided CVC was placed in the right internal jugular vein (IJV), left radial artery was used for invasive blood pressure monitoring and two large bore 16 gauge cannulas were secured for rapid infusion. Anaesthesia was maintained with Isoflurane, oxygen, Nitrous oxide and analgesia via

epidural (initially loaded with 12 ml of 0.125% Bupivacaine, then continuous infusion at 6-8 ml/hrs). Renal protection strategies included avoidance of nephrotoxic agents, maintenance of renal perfusion pressure (MAP >90) and central venous pressure (10-12 cmH20), urine output 2ml/kg body weight, maintained throughout the procedure to prevent further renal injury. The patient remained stable throughout the procedure; the surgery lasted for 145 minutes and the anaesthesia duration was 180 minutes. The excised tumour mass was 20x10 cm with blood loss of 400ml. The patient's trachea was extubated and she was shifted to post-anaesthesia care unit. Her postoperative immediate haemoglobin was 10.3 g/dl and creatinine at discharge (eighth postoperative day) was 1.3. The patient's histological findings were FIGO stage Ia mixed MOGCT (dysgerminoma 95% and yolk sac tumour 5%). She received three cycles of BEP. The three-year follow up scans and biomarkers were negative for malignancy and she had regular menstrual cycles. The patient's consent was taken for publishing the case.

Discussion

Our case support's the existing evident literature[5] for MOGCTs. Our patient was diagnosed with mixed MOGCT at the early stage of the disease, she underwent successful fertility-sparing surgery, followed by three cycles of BEP[5] and achieved a remarkable clinical outcome in terms of negative follow up scans for malignancy and maintained regular menstrual cycles. The challenging part in our case was the AKI, anaemia and tumour invasion of IVC and aorta. The anaemia was managed by transfusion of two units packed red blood cells the night before surgery to optimise oxygen-carrying capacity and to overcome the challenge of great vessel's tumour dissection. Luckily, the tumour was excised smoothly from the aorta and IVC and further blood transfusion was not required. The AKI management was based on the Kidney Disease Improving Global Outcomes (KDIGO)[8] criteria. The patient was not allowed to be exposed to nephrotoxic agents and adequate volume status was maintained by central venous pressure of 10-12 cmH20 and to ensure urine output of 2 ml/kg body weight. The functional haemodynamics were targeted by sustained renal perfusion pressure (MAP >90). The proposed surgical challenge and pain was managed with adequate anaesthesia depth and working epidural. Nevertheless, the patient certainly tolerated blood transfusion, surgical stress and later responded to BEP therapy without further deterioration in kidney injury and her serum creatinine (baseline 3.2 to 2.1) on first postoperative day to 1.3 mg/dl on 8th postoperative day) which had significantly improved after relieving obstruction from the urinary tract system.

Conclusion

MOGCT devises excellent clinical outcome once it presents at an early stage and the patient undergoes proposed treatment strategies, including fertility-sparing surgery and BEP therapy. MOGCT's rare presentation such as major vessels invasion and AKI needs multidisciplinary (gynaecology, nephrology, oncology and anaesthesiology) team approach to target the required clinical outcome.

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Conflict of Interest: None to declare

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