

Wilms tumour with intracardiac extension - multimodal approach to a challenging case

Sir,

Anaesthesia for surgery for Wilm's tumour in advanced stage is a great challenge as the condition is often seen in young children with limited reserve further complicated by disease process, prior chemotherapy and paraneoplastic associations such as hypertension and coagulopathy.^[1]

A 2-year-old child was admitted to our institution with a biopsy proven right nephroblastoma that did not respond to neoadjuvant chemotherapy. Computerised tomography scan revealed a large right renal tumour with a cavoatrial thrombus [Figure 1]. Echocardiogram revealed a large tumour thrombus (20 mm × 15 mm) in the right atrium encroaching the tricuspid valve and mild pericardial effusion. The treatment plan was right radical nephrectomy with inferior vena caval (IVC) thrombectomy and right atriotomy under cardiopulmonary bypass.

Pre-anaesthetic evaluation revealed an emaciated child weighing 13 kg with a disproportionately protuberant abdomen, pallor, pedal oedema and tachycardia. Her coagulation profile and renal function tests were normal. The day before surgery, right renal artery angioembolisation was undertaken to decrease tumour vascularity and ease surgical extirpation. Anaesthesia was induced with fentanyl 2 µg/kg, ketamine 2 mg/kg

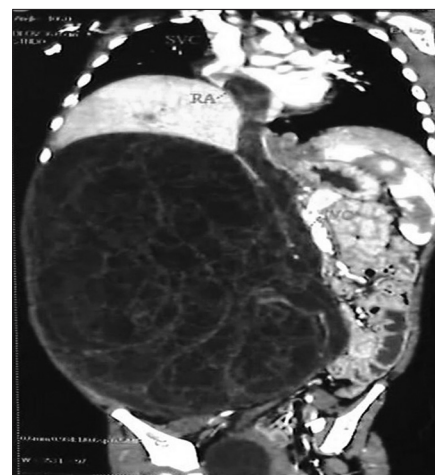


Figure 1: Pre-operative computerised tomography urogram demonstrates large right renal tumour with extension of tumour thrombus into right atrium

and vecuronium 0.08 mg/kg. Monitoring included electrocardiogram, pulse oximetry, end-tidal carbon dioxide, central venous pressure, intra-arterial blood pressure, temperature and urine output. Mechanical ventilation with a tidal volume of 6 ml/kg was instituted with airway pressure maintained around 28 mmHg and the end-tidal carbon dioxide maintained at around 42 mmHg. Anticipating haemodynamic fluctuations, two arterial lines and one central venous catheter were secured after induction. Through a right thoraco-abdominal incision, right radical nephrectomy, cavotomy and extraction of vena caval thrombus was performed [Figure 2]. Blood loss encountered was about 100 ml. Moderate degree of hypotension was experienced which responded to volume replacement. Intraoperative echocardiography demonstrated the persistence of right atrial thrombus. Right atriotomy was then undertaken under deep hypothermic circulatory arrest (DHCA) with a core body temperature of 18°C and the thrombus was extracted. The total circulatory arrest time was 3 min. After clearance of tumour, circulation was restored, and atrial reconstruction was completed during the rewarming phase. The patient required inotropic support (adrenaline 0.03 µg/kg/min) during the procedure. Approximately 300 ml of packed red blood cells and 350 ml of fresh frozen plasma were transfused. The total duration of the procedure was 8 h. The child was electively ventilated and extubated on the following day. By the 5th day, she was moved out of the Intensive Care Unit and

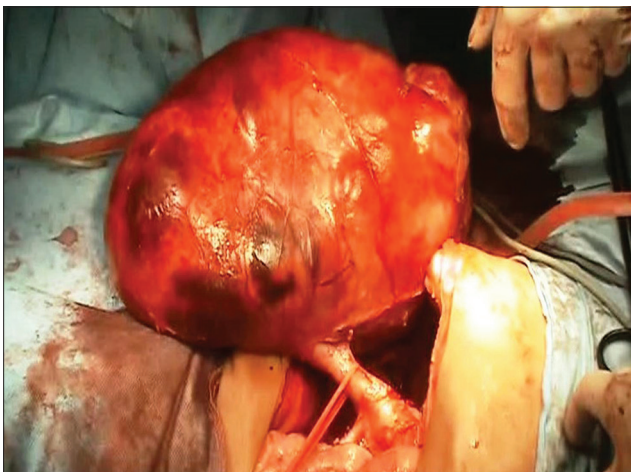


Figure 2: Intraoperative appearance of tumour

discharged on the 14th day. Post-operative period was fairly uneventful except for mild renal dysfunction which responded to conservative management.

Wilm's tumour is the fourth most common paediatric malignancy.^[2] Complete surgical clearance improves the prognosis but may be demanding in advanced lesions as it has the propensity to extend into the cardiac chambers along the inferior vena cava. A multidisciplinary approach will facilitate favourable outcome in such situations.^[3] Intraoperative course may be stormy and the anaesthesiologist should be equipped to tackle this. The major intraoperative concerns are heat loss, fluid balance, inadequate ventilation due to raised intra-abdominal pressure, haemodynamic fluctuations in the face of intermittent IVC compression, tumour embolisation and major haemorrhage. Cardiopulmonary bypass is employed to avoid tumour embolisation.^[4] DHCA enabled excellent surgical exposure, but the duration of circulatory arrest had to be limited to ward off complications.^[5]

The disproportionate size of the tumour in comparison to the weight of the child and its physiological consequences made this case unique. A multidisciplinary approach and close coordination between various specialties is what saw the child through the technically demanding procedure and convalescence.

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Conflicts of interest

There are no conflicts of interest.

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