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Anesthetic Management of Radical Nephrectomy with IVC Thrombectomy Using Liver Transplantation Technique in A Paediatric Patient

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Abstract

Wilms tumour is the commonest neoplasm affecting children. Vascular extension to IVC occurs in 4-10%cases and it can extend up to right atrium in 1-2% cases. Surgical Resection is the treatment of choice as 5 year survival rate is 40-60% in absence of metastasis 50% even with evidence of metastasis.

We report a case of 5 year old child with wilms tumour and level IV thrombus posted for open radical nephrectomy with thrombectomy using liver transplantation technique.

Peri operative management of such cases is a great challenge for anaesthesiologist, as it requires meticulous management of fluid and inotropes management to achieve succsessfull end result.

Keywords: Right Atrium Tumour Extension, Hypotension, MDT.

Introduction

Renal tumours have biological propensity for venous invasion and formation of tumour thrombus. Pre-operative prediction of complications and Multidisciplinary team (MDT)planning plays pivotal role to achieve successful surgical outcome in such cases. It considers many factors like type of surgical technique used, stage of tumour, level of thrombus, presence of venous collaterals, Prescence of preexisting thrombus. Anaesthesia management based on fruitful peri operative

MDT discussion can iron out many anticipated complications.

Case Report

A 5year /20 kg male child presented with history of swelling in left hypochondriac region since 6 months. CECT scan was suggestive of large necrotic rounded soft tissue mass in lower pole of left kidney (74x76x70mm) with partial thrombosis of left renal vein extending to IVC and bulging into right atrium (6x6 mm). He was started on chemotherapy consisting of actinomycin and vincristine 8 cycles and was posted for left open radical nephrectomy with IVC thrombectomy using liver transplantation technique. On preoperative evaluation, general examination and systemic examination was grossly normal. Patient was conscious, oriented, following verbal command. Pre op vitals were - Pulse – 92/min, BP - 110/70 mm Hg,SPO2- 99 % on room air. Pre op Investigations were as follows-CBC – 9.4gm%,7100/cmm,367000, S creatinine-0.3 Serum electrolytes - Na- 139.8meq/l, K- 4.65meq/l, PT- 13.5, INR- 0.96, APTT- 30.1 CXR – WNL, ECG -T inversion in L2 L3

2 -D ECHO was suggestive of Spontaneous echo contrast in right atrium, thrombus in IVC.

Anesthetic Management

Patient was evaluated thoroughly preoperatively. Defibrillator, cardiac drugs, blood products were kept stand by. Written and informed high-risk consent was taken. Patient was premedicated with, Inj glycopyrrolate 0.08 mg IV, Inj ondansetron 2mg IV, Inj fentanyl 60 microgram IV, Patient was induced with thiopentone sodium 5 mg/kg IV , suxamethonium 2mg/kg IV. Intubated with oral cuffed ET tube no 5. 10 F ryles tube for stomach decompression was inserted. Right IJV (5.5F triple lumen) and right radial arterial line(22G) were secured under USG guidance. Patient was maintained using oxygen, air, sevoflurane and Inj atracurium infusion 0.1mg/kg/hr.

Intra Operative Charting

	Baseline	Left tumour dissection and nephrectomy	Suprahepatic IVC dissection	Before IVC clamp	During IVC clamp	After IVC clamp
HR	145	114-122	128	133	166	148
ABP	117/58	115/63-130/68	99/68	122/67	90/60	76/40
SPO2	97	100	99	100	100	99
ETCO2	24	27	27	27	24	24
CVP	7	6	4	12	13	12
ABGA						
PH				7.281		7.292
LACTATE				3.06		5.88
BE				-8.2		-8.1
Hb				13.02		6.67
Pco2				39		37.5

Hypotension was anticipated at the time of IVC clamping during thrombectomy which was managed with fluids (RL 150 ml NS 250 ml),colloid and Injection noradrenaline infusion @ 0.03mcg/kg/min. Peri operative renal protection was achieved with Inj Mannitol 0.5g/kg .Acidosis was corrected before clamp release with NAHCO3 infusion .Inj adrenaline 20mcg bolus was given at the time of clamp release. Duration of surgery was 9 hrs , IVC clamp time was 20 mins , total IVF given 1500 cc(according to cvp),colloid-250ml ,urine output was 550ml. Blood loss was ~ 600ml managed with PCV-400ml.

At the end of procedure analgesia Inj paracetamol 15 mg/ kg and Inj Tramadol 2 mg /kg was given and patient was reversed with Inj glycopyrrolate 0.16mg iv and Inj neostigmine 0.05mg/kg and extubation was done on table.

POST OPERATIVE – Patient was conscious, oriented, following verbal commands , shifted to ICU/HDU and was vitally stable.

Post op ABGA was done-PH-7.351, LACTATE -3.96, BE - -5.6

DISSCUSSION -

Wilms tumour is a common Paediatric malignancy, but advanced lesions have the propensity to extend in to cardiac chambers along IVC, so intra operative course may be stormy .Anaesthesia management of renal mass with Cavo atrial extension demands real time closed loop communication between surgeon and anesthetist intraoperatively as it depends on knowledge of predictable haemodynamic changes associated with each surgical step.

The major intra operative concerns in our case were prevention of AKI and tumour embolism. Ivc clamp management was the crucial step which was successfully managed by achieving optimal haemodynamics using fluid boluses as per CVP and nor ad infusion before IVC clamp release. Harshit et al (BJUI Compass 2022 Sep 3 (5) 327-330) observed progressive decrease in MAP and CI with increased SVV during surgical control and ligation of IVC branch vessels including lumbar vessel. He suggested preventive measures like volume replacement and ionotropes in timely fashion to efficiently manage catastrophic events like AKI, tumour embolism during clamp release. To detect tumour embolization vigilant monitoring of ETCO2 was done and defibrillator and cardiac drugs were kept stand by; but luckily, we did not witness it. Heat loss was managed with warm iv fluids and warmers. (Therma)

Conclusion

Anesthesia for surgery for wilms tumour in advanced stage is a great challenge. The disproportionate size of tumour in comparison to the weight of child and it's physiological consequences made this case unique . A multidisciplinary team approach and close coordination between urosurgeon, anesthesiologists and oncologist is what saw the child through the technically demanding procedure and convalescence .

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