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Anaesthesiology

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ANAESTHETIC MANAGEMENT IN PATIENT OF RENAL CELL CARCINOMA UNDERGOING ROBOTIC RADICAL NEPHRECTOMY WITH INFERIOR VENA CAVA TUMOUR THROMBECTOMY.

Dr. Tharun Mahathe — 3rd Year Resident, Department of Anesthesia and Critical Care, Institute of Kidney Diseases and Research Center & Dr. H L Trivedi Institute of Transplantation Sciences, Civil Hospital Campus, Asarwa, Ahmedabad - 380 016, Gujarat, India.

Dr. Vivek Maru — 2nd Year Resident, Department of Anesthesia and Critical Care, Institute of Kidney Diseases and Research Center & Dr. H L Trivedi Institute of Transplantation Sciences, Civil Hospital Campus, Asarwa, Ahmedabad - 380 016, Gujarat, India.

ABSTRACT

INTRODUCTION: Renal cell carcinoma has vascular invasion and extend into IVC and even into the right-sided cardiac chambers. Nephrectomy with thrombectomy provide palliation of symptoms with 5-year survival rate of 72% in absence of distant metastasis.

AIMS AND OBJECTIVES: Anaesthetic management varies based on extension of tumour and is challenging due to IVC clamping, hemodynamic instability, potential for massive haemorrhage, and risk of intra operative tumour embolization.

METHODOLOGY: A 62-year-old male hypertensive with COPD patient presented with pain in right lower back and haematuria. He was evaluated with USG abdomen, CT abdomen, confirming right RCC with thrombus extending into right renal vein and infradiaphragmatic IVC. The patient was planned for right radical nephrectomy with IVC thrombectomy.

RESULT: The intra operative course was hemodynamically stable, except when the IVC was clamped during thrombectomy. Hypotension was managed with injection noradrenaline 0.03–0.05mcg/kg/min. Patient was extubated next morning as he was hemodynamically stable

CONCLUSION: Successful anaesthetic management of RCC with IVC thrombus requires meticulous monitoring. Central venous pressure and hourly urine output monitoring can be used to achieve desired hemodynamic goals.

INTRODUCTION:

Renal cell carcinoma (RCC) represents 2%–3% of all visceral malignancies. Locally advanced vascular invasion in renal vein and inferior vena cava is seen in 10% cases. Only 2% of cases present with thrombus involving supradiaphragmatic IVC. Anesthesia challenges require rigorous preoperative assessment of cardiovascular, respiratory parameters, intra-operative management of goal directed fluid therapy, post operative analgesia and monitoring in high dependency unit are the key points of management protocol.

Case Presentation:

A 62-year male patient hypertensive with COPD c/o pain in the right lower back followed by hematuria along with increased frequency of micturition, generalized body weakness and loss of appetite for 3 months. He was hypertensive and chronic smoker for 10 years

On examination: patient is conscious, oriented and afebrile Pulse-72 bpm, BP-120/86, RR- 14 breaths/min. No pallor, icterus, clubbing, cyanosis, edema CVS- S1, S2 + RS- Bilateral air entry normal.
No history of HTN/DM/TB/seizure/asthma/CAD/CKD

Drug History: T.Arkamine TDS, T. Nifedipine BD, Rotahaler sos

Preop Investigations:
Hb-10.2, TLC-6200mm^3, PC-2.8L, Creatinine-1.4, PT/INR-11/1.2
Na/k-136/3.8, RBS-114, LFT- normal
ECG/CXR- normal

2DEcho- EF-60%, RVSP-28, No RWMA, Visible portion of pulmonary artery is free of clot
Fundus examination- Normal

USG: Right renal mass (8*8) with tumor thrombus extending into right renal vein and infra diaphragmatic inferior vena cava (IVC).

All the hematological reports were within normal range and was posted for robotic radical nephrectomy with thrombectomy after consent was taken. Pre operative nebulization was given with inhaled bronchodilators and steroids.

Intraoperative Anesthetic Management:
Choice of anaesthesia was balanced general anaesthesia with endotracheal intubation and invasive monitoring using flowtrac monitor. Inside OT anxiolysis was done using midazolam 1 mg. Baseline vital parameters were normal. Balanced anesthesia was given using

Premedication: glycopyrrolate-0.004mg/kg, ondansetron-0.1mg/kg fentanyl-3 mcg/kg

Induction: Propofol 1.5 mg/kg and intubation was facilitated using injection atracurium 0.5 mg/kg.

Maintenance: O_2+ N_2O+ isoflourane+ intermittent dose of relaxant.

Left radial artery and right internal jugular vein were cannulated under USG.

Flowtrac monitor was attached, baseline stroke volume variation (SVV), systemic vascular resistance (SVR), cardiac output (CO), central venous pressure, airway pressure, lung compliance end tidal CO2 were noted. After pneumoperitoneum and Trendelenburg position again, all parameters were reassessed. Intraoperative hypertension due to increase in the venous return was controlled with isoflurane and nitroglycerine infusion 0.1-0.5 mcg/kg/min. Hypotension was anticipated at the time of IVC clamping during thrombectomy which was managed with fluids and injection noradrenaline 0.03–0.05 mcg/kg/min. As a part of venous thromboprophylaxis 100U/kg of heparin should be administered. After successful thrombectomy and radical nephrectomy, injection Noradrenaline infusion was continued at 4ml/hr according to the requirement of patients'

blood pressure. Intraoperative blood loss was around 3200 ml and the loss was managed with crystalloids 2000ml, colloids 500ml, PCV-4 units and FFP- 2 units. Intraoperatively, CVP was maintained between 8-12 cm of H_2O. The surgery lasted for 6 hours.

Postoperative Care:

The patient was not extubated and placed on post operative mechanical ventilation and was extubated the next morning after he was stable hemodynamically and after proper weaning trials.

DVT stockings, LMWH (Inj. Clexane 0.4mg SC) and after that inj. Warfarin 5mg was continued as a part of venous prophylaxis.

DISCUSSION:

Primary focus in the preoperative assessment is made to assess functional capacity for cardiorespiratory condition. A multi-disciplinary approach consisting of radiology, anesthesia, urology and vascular surgery is essential. Monitoring of coagulation parameters thromboelastography, blood gas analysis, activated clotting time, Prevention of hypothermia and venous thromboprophylaxis with heparin 100 U/kg before clamping is the part of intra operative management. Another anesthetic consideration is the intraoperative blood loss. Blood loss in RCC with IVC thrombus may be of the range 100–5000 mL (mean 500 mL). In our case, the loss was approximately 3200 ml and was appropriately managed using warm fluids. Early post op screening for DVT should be done.

CONCLUSION:

Administration of GA in Renal Cell Carcinoma with Inferior Vena Cava tumour for major blood vascular procedure is challenging and need special attention to pre-operative optimization of the patient, peri-operative management of CVS and maintenance of cerebral and other organ perfusion with maintenance of acid base status is also important.

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