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ANAESTHETIC MANAGEMENT OF RIGHT RADICAL NEPHRECTOMY WITH THROMBECTOMY – A CASE REPORT

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Abstract

Introduction: Renal carcinoma is a frequent malignant tumour of the urinary system. Renal vein tumour thrombus development can be caused by the accumulation of cancerous cells in the renal veins. Patients with renal cancer and venous thrombus can now benefit from radical nephrectomy and thrombectomy as major therapy options. Anaesthetic management of a patient undergoing radical nephrectomy and thrombus thrombectomy for renal cell cancer plays a pivotal role. **Case presentation:** A 56-year-old lady with renal cell carcinoma in her right kidney with a thrombus in inferior vena cava posted for right radical nephrectomy with thrombectomy. She also on treatment for type 2 diabetes mellitus and systemic hypertension. We discussed the anaesthetic technique and management. The peri operative and post operative period was uneventful. **Discussion:** It can be difficult to maintain anaesthesia in individuals with renal cell carcinoma who have tumour thrombus in the inferior vena cava (IVC). This study details the anaesthetic management experience of a patient undergoing radical nephrectomy and thrombus thrombectomy for renal cell cancer with thrombus buildup in the IVC. **Conclusion:** An essential factor in the successful excision of RCC that metastasizes into the IVC is the management of anaesthesia and intense postoperative care.

Keywords: Nephrectomy, Thrombectomy, Anaesthesia, Induction, Surgery.

INTRODUCTION

Globally, renal cell carcinoma (RCC) ranks second in frequency among urological cancers. Renal vein tumour thrombus development can be caused by the accumulation of cancerous cells in the renal veins. If the tumour thrombus continues to expand, it may eventually extend into the right atrium and the inferior vena cava (IVC). In between 4% and 10% of cases of renal cell carcinoma, venous tumour thrombus is also present.[1] 40–68% of patients who have severe surgery, such as radical nephrectomy (RN) combined with IVC thrombectomy, survive after five years.[2]

At the past, surgical therapy options were restricted for patients with renal cell carcinoma complicated by venous thrombosis since the condition was thought to be at an advanced stage. Moreover, performing surgical operations is tough, risky, and difficult. Patients with renal cancer and venous thrombus can now benefit from radical nephrectomy and thrombectomy as major therapy options thanks to recent advancements in surgical procedures. [3,4] But if the thrombus dislodges, there's a very significant chance of dying. High-quality imaging is necessary for preoperative care of RCC with IVC thrombus in order to identify any subsequent tumour thrombus expansion. The anesthesiology team plays a crucial role in preoperative and postoperative planning in such cases.

Here, we describe a case of anaesthesia management during tumour thrombus removal in the IVC in renal cell carcinoma in order to enhance anaesthesia management, lower complications, and increase the survival rate of such patients.

Case Presentation:

A 56-year-old female presented with complaints of haematuria since, five days. On evaluation of patient found to have primary neoplastic lesion in her right kidney with IVC thrombus hence planned for Right radical nephrectomy with thrombectomy. Her CECT abdomen showing the right renal mass with IVC thrombus (Figure 1) in figure 2 CECT abdomen showing renal mass.

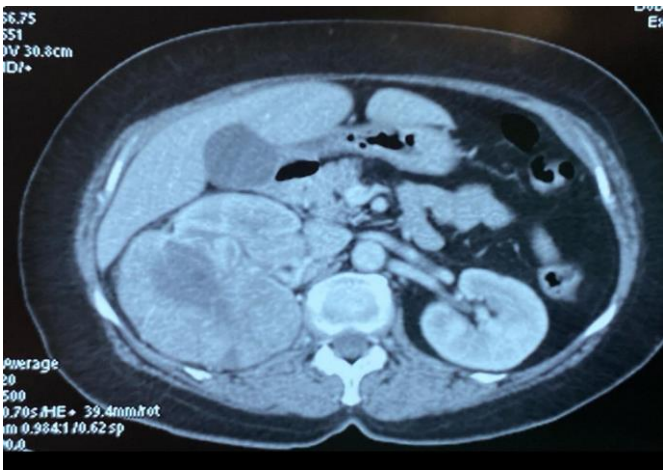

Figure 1: CECT Abdomen Showing the Right Renal Mass with IVC Thrombus

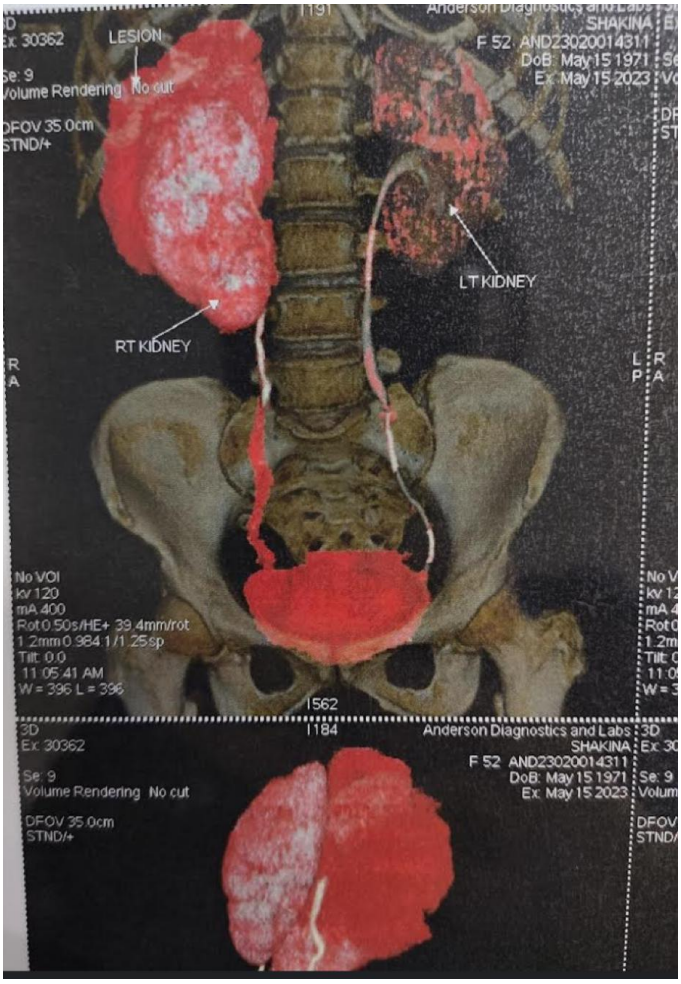

Figure 2: CECT Abdomen Showing Renal Mass

She is a known case of Type II Diabetes mellites, Hypertension, Dyslipidaemia, Coronary artery disease (CAD) on treatment. She belonged to ASA class III (patient with severe systemic disease) and surgery was planned under general anaesthesia. On day of surgery her pre-operative vitals was checked and shifted to OT. After shifting the patient to OT, monitoring devices including Electrocardiogram (ECG), Non-invasive blood pressure (NIBP) and pulse oximetry were attached. Intravenous access was rescued using 18G cannula in both upper limbs.

Pre-Operative Management:

As a part of pre-treatment before induction of anaesthesia Glycopyrrolate 0.2mg IV was given.

Intra-operative Management:

Induction of anaesthesia was carried out with Inj. Thiopentone 125mg IV, Inj. Atracurium 30mg IV. Then patient was intubated with endotracheal tube (Orotracheal). Central venous catheter of size 7fr was kept in right internal jugular vein using Seldinger technique to monitor Central Venous Pressure (CVP). Anaesthesia was maintained with O2, N2O (50:50) and isoflurane (0.8%). Muscle relaxation was maintained. Inj. Atracurium as and when required. After successful induction of anaesthesia, we performed the planned surgery. Intra-operatively patient had increase in blood sugar, which was maintained using Alberti regimen. For a brief period IVC was clamped, mean arterial pressure of 60mmHg was maintained. During incision significant blood loss occurred in surgical field. Blood loss was approximately 800ml. At this time, owing to blood loss in surgical field, 2U Prbc transfusion was provided. Duration of surgery was approximately 3:30 hours. After observing adequate efforts from patient, she was reversed using Inj Neostigmine 2.5mg IV + Inj Glycopyrrolate 0.5mg IV and extubated.

Post-operative Management:

For post-operative analgesia, catheter was placed in rectus sheath, 0.125% Bupivacaine 20ml Q8h was administered. Post extubation was uneventful. The patient's recovery went well, and his postoperative hemodynamics were stable. She was observed in post-operative ward for 30 minutes and shifted to SICU. The procedure went well, in figure 3 shows specimen showing right kidney with thrombus in IVC.

Figure 3: Specimen Showing Right Kidney with Thrombus in IVC

DISCUSSION

In this case, a patient with renal cell carcinoma experienced venous thrombosis; prompt removal of the tumour thrombus was the only option to preserve the patient's life.

In oncologic urology, RN and IVC tumour thrombectomy rank among the most difficult open surgical procedures. [7] According to earlier research, after radical nephrectomy and thrombectomy, the 5-year survival percentage for patients with renal cancer who do not have lymph nodes or distant metastases is roughly 50%. [5,6] The cornerstone of treatment for localised renal cell carcinoma (RCC) is still radical nephrectomy (RN).[7]

Although nephron-sparing and minimally invasive surgery are becoming more and more common, open RN is still a valuable and safe method of managing renal cell carcinoma. Large, complicated tumours that are not responsive to conventional radiotherapy or that pose a risk of problems after Lastly, open RN is essential for tumour thrombectomy and frequently necessitates further procedures for care of bland thrombus, occlusion, IVC access, and circulatory support. [8]

The anaesthetist needs to be aware of the many surgical techniques and ready to help patients and surgical colleagues decide which treatment plan is appropriate for their condition based on preoperative evaluation results and staging of malignant illness.
Nephrectomy is still a potentially difficult situation for the anaesthetist in the twenty-first century. A substantial amount of acute discomfort is sometimes associated with open nephrectomy, necessitating the use of opioid analgesics if regional analgesia is avoided or is ineffective.[9] Preoperative discussions about end-of-life care are crucial because of the high rates of morbidity and mortality associated with these patients. When these conditions arise, patients should be made aware of the possibility of multisystem organ failure and expressly state what kind of treatment they would like to receive. [10]

Patients suffering from thrombi in the vena cava have reduced venous return. Hypotension can be seen during the induction of anaesthesia because of the general anesthetic's effect on cardiac output and the subsequent decrease in venous return. Thus, hydrating patients prior to the administration of anaesthesia can aid in their ability to cope with this circumstance. [11] The cardiac index and arterial blood pressure can drop due to IVC clamping and the presence of a thrombus. In our patient, Central venous catheter of size 7-Fr was kept in right internal jugular vein using Seldinger technique to monitor Central Venous Pressure (CVP). Catheter was placed in rectus sheath.

In another similar study, 1,500 mL of 0.9% saline solution was used to guarantee preoperative hydration. IVC clamping and the existence of a caval thrombus can also cause a decrease in the cardiac index and arterial blood pressure. An 8-Fr introducer with a 10-cm-long sheath and two additional 16-G venous catheters were placed into the internal jugular vein in order to start intravenous fluids and positive inotropic medication and maintain arterial pressure at a sufficient level. Longer central venous cannulae may have interfered with the atrial thrombus and resulted in embolism, hence this length of sheath was preferred. This study shows more efficacy in their procedure.[11] In present study, during incision significant blood loss occurred in surgical field. Blood loss was approximately 800ml. At this time, owing to blood loss

in surgical field, 2U Prbc transfusion was provided. Considerations such as a thorough preoperative assessment of the tumor's dissemination, CPB readiness, and/or extracorporeal venous shunting are crucial for the anaesthetic management of RCC with invasion of the IVC. [12] Additionally, there is a high perioperative risk associated with resectioning RCCs that have an IVC tumour thrombus. A well-planned strategy, a combination of knowledge and experience, and tight inter- and intra-departmental cooperation between anesthesiologists and surgeons are necessary for successful results. [13] For post-operative analgesia, catheter was placed in rectus sheath, 0.125% Bupivacaine 20ml Q8h was administered. In post-operative pain management anaesthesiologists play a vital role in such cases.

The procedure was successfully completed by a multidisciplinary team that included urologists, cardiovascular surgeons, and anaesthetists. While offering valuable insights into tailored anesthesia strategies for complex cases, its shortcomings, which call for more research to confirm its conclusions, include the absence of long-term follow-up data and the inherent limits of being a single-case study.

CONCLUSION

Optimising the surgical result for patients with IVC tumour thrombus and RCC requires comprehensive surgical treatment. Likewise, crucial preoperative, perioperative, and postoperative factors might enhance patients' surgical results.

An essential factor in the successful excision of RCC that metastasizes into the IVC is the management of anaesthesia and intense postoperative care.

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