



Anesthetic Management of a Patient with End-Stage Renal Disease and Post-Renal Transplant Failure Posted for Meshplasty: A Case Report

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ABSTRACT

End-stage renal disease (ESRD) presents several anesthetic challenges due to its systemic effects on multiple organ systems, especially when complicated by post-renal transplant failure. This case report discusses the anesthetic management of a 37-yearold male patient with ESRD following renal transplant failure, posted for umbilical hernia repair with meshplasty. The patient's comorbidities, including hypertension, heart failure, and dialysis dependency, required a tailored anesthetic approach. Epidural anesthesia was chosen to provide adequate pain control, enhance hemodynamic stability, and optimize renal perfusion during the surgery. The procedure was uneventful, and the patient was managed postoperatively with close monitoring and planned hemodialysis.

Introduction:

Chronic renal failure, particularly in its advanced stages, is associated with various systemic abnormalities that complicate anesthetic management. These patients often present with cardiovascular, respiratory, and hematologic disturbances that must be carefully considered during perioperative planning. This case report highlights the anesthetic management of a 37-year-old male with end-stage renal disease (ESRD) and post-renal transplant failure, undergoing umbilical hernia repair with meshplasty. The report outlines the challenges faced and the strategies used to ensure safe anesthetic care in a high-risk patient.

Case Report:

A 37-year-old male presented with a 4x5 cm swelling in the umbilical region, associated with dull aching pain for the past two months. His medical history included Hypertension for 9 years, managed with T. Atenolol 50 mg OD; Renal transplantation 9 years ago, followed by chronic allograft nephropathy 2 years ago, eventually leading to end-stage renal disease (Stage 5), with regular hemodialysis twice weekly; Dyspnea on exertion (Grade 2) for the past 2 years. Laboratory investigations revealed: Hemoglobin: 8.9 g/dL, Blood Urea: 90 mg/dL, Serum Creatinine: 6.2 mg/dL, Platelets: 156,000 micro/uL, Prothrombin Time: 13.5 sec, INR: 1.3, Activated Partial Thromboplastin Time: 34 sec. ECG showed Left axis deviation, left ventricular hypertrophy. Echocardiogram revealed Global hypokinesia of the left ventricle, dilated heart chambers, severe tricuspid regurgitation , severe pulmonary arterial hypertension , severe aortic regurgitation , mild mitral regurgitation , concentric Left ventricular hypertrophy, ejection fraction (EF) of 40% and Grade 1 diastolic dysfunction.

The nephrologist advised consecutive hemodialysis prior to surgery, with the last dialysis being heparin-free and to plan the surgery on the third day after the final dialysis. The patient was assessed and accepted for surgery under ASA-3.Informed written high risk consent obtained.

On the day of surgery patient was shifted inside operation theatre and standard monitors were attached (Pulse oximeter, Noninvasive blood pressure monitoring and 5 lead ECG).Baseline vitals were noted. Intravenous fluid started after securing 18G IV cannula on the right hand. Patient was put in sitting position and under aseptic sterile precautions parts painted and drapped. With 18G Tuohy epidural needle and catheter, by loss of resistance to air technique epidural anesthesia was administered at the T7-T8

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interspace using 2% Lignocaine + Adrenaline (8 cc) . Adequate level achieved upto T4. Intraoperative vitals and input output monitored, patient was stable and procedure went uneventful. Post operative analgesia was given once using Inj.Bupivacaine 0.0625% 6cc epidurally and catheter removed as the patient was planned for haemodialysis on post operative day-1.

Discussion:

Chronic kidney failure, defined by an estimated glomerular filtration rate (eGFR) of less than 60 mL/min/1.73m² for three or more months, is associated with multiple systemic complications. This patient, with end-stage renal disease (ESRD) and hypertension, faces several challenges during the perioperative period. Renal failure often impacts cardiovascular, neurological, hematological, and metabolic functions.

Cardiovascular System (**CVS**): Chronic kidney disease (CKD) frequently leads to hypertension, heart failure, and silent myocardial infarction. This patient's echocardiogram findings of global hypokinesia, severe tricuspid regurgitation, and pulmonary hypertension emphasize the complex cardiac management required during surgery.

Central Nervous System (CNS): CKD patients are prone to uremic encephalopathy, seizures, and polyneuropathy. These neurological effects are exacerbated by the accumulation of toxins and electrolyte imbalances, which necessitate careful monitoring.

Hematological Issues: Anemia is a common feature in CKD, and coagulopathy due to impaired platelet function adds complexity to surgical management. This patient's anemia and mildly elevated INR (1.3) require attention to minimize bleeding risks during surgery.

Metabolic Complications: Metabolic disturbances, such as acidosis, hyperkalemia, and electrolyte imbalances, are frequent in CKD. These must be closely managed to prevent serious complications during surgery.

Dialysis Complications: Patients on hemodialysis are at risk of infection and malnutrition. Close coordination with the nephrology team is necessary to ensure proper fluid and electrolyte management and prevent infections, especially from dialysis access sites.

Anesthesia Considerations: Thoracic epidural anesthesia, administered at the T7-T8 interspace, offers significant advantages for this patient. The sympathetic blockade achieved at the T4-T10 levels can improve renal perfusion by dilating renal vasculature, which is crucial for maintaining kidney function in CKD patients. This blockade also helps stabilize hemodynamics by reducing systemic vascular resistance, decreasing the risk of hypotension and associated complications. Additionally, epidural anesthesia reduces postoperative cardiac morbidity and opioid consumption, which is especially important in a patient with cardiovascular disease. The primary anesthesia goals in such high-risk cases are to maintain renal perfusion, carefully manage fluid balance, and avoid nephrotoxic drugs.

Conclusion:

In this patient with chronic kidney disease and cardiovascular complications, maintaining stable hemodynamics and a high level of suspicion to prevent complications were crucial for a successful outcome. The use of thoracic epidural anesthesia improved renal perfusion and helped reduce postoperative complications. Vigilance in managing hemodynamic stability and identifying potential issues played a key role in achieving a better outcome and facilitating a smoother recovery for this high-risk patient.

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