Anesthesia For A Renal Transplanted Patient With Acute Graft Rejection Coming For Emergency Surgery

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Citation

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Abstract

Purpose:
To describe the anesthetic management of a renal transplant patient with acute graft rejection coming for incidental surgery.
Clinical feature:
A 30 year old male, who has undergone live related renal transplant in the recent past and was on pulse steroid therapy for acute graft rejection, presented to us with symptoms of an acute abdomen. Examination showed that the patient was anemic and dehydrated with diffuse guarding of abdomen. Investigation revealed free gas under diaphragm radiologicaly, elevated renal parameters and neutrophilic leucocytosis.
Conclusion:
In a patient who has undergone renal transplant and coming for incidental surgery with acute graft rejection and insufficient renal function, the anesthetic consideration include avoidance and curtailment of further nephrotoxic insult during perioperative period and strict maintenance of asepsis.

INTRODUCTION

Each year approximately 1500 patients with end stage renal disease (ESRD) receive a kidney transplant in India and the one-year survival rate for the first transplant is nearly 60-85%. These patients may present for any type of surgery and one of the complications in post transplant period resulting in high mortality was upper gastrointestinal hemorrhage or perforation ($_{1}$). High dose of prednisolone, which is given as a measure of immunosupression during acute graft rejection, is undoubtedly an important factor. We present the anesthetic management of a patient who underwent live related renal transplant (LRRT) in the recent past and was on pulse steroid therapy for acute graft rejection coming for gastric perforation repair.

CASE REPORT

A 30 year old male patient weighing 41Kg presented to us with severe pain abdomen and on subsequent examination and investigations, he was diagnosed as gastric perforation. He was taken up for surgery with ASA grade IV E risk.

Pre anesthetic evaluation revealed that the patient had known chronic renal failure (CRF), ESRD, hypertensive and was on maintenance hemodialysis through a left arterio-venous fistula (a-v fistula). The patient underwent LRRT with his mother as kidney donor 20 days back. He had delayed graft function with superimposed graft rejection. He has been on triple immunosupression therapy with cyclosporine-A (CS-A), mycophenolate moefitil (MMF), and prednisolone.

On examination the patient was conscious, oriented, afebrile with a base line heart rate (HR) of 120 min –1, blood pressure (BP)-170/130 mm of mercury, respiratory rate (RR)- 42 min –1. General examination showed that patient was anemic, dehydrated and not edematous. Systemic examination showed that the patient had grade IV retinopathy, diffuse grading of abdomen and a favorable airway (Mallampatti-I). Further investigation showed a haemoglobin-10.4gm%, neutrophilic leucocytosis, blood urea nitrogen (BUN) 91mg%, serum creatinine 3.5mg%, serum sodium 130 meq/L, serum potassium 4 meq/L, urine output (UO) of more than 3 liter per day. Liver function tests, electrocardiogram, chest X-ray did not show any abnormality.

The patient was premedicated with intra muscular (IM) glycopyrrolate and intravascular (IV) ranitidine 150mg, and IV ondancetron 30 minutes before surgery. A nitroglycerine

infusion was started with a syringe pump at a rate of 5-15 µgm/kg/minute to control the high blood pressure.

On arrival at the operating theatre, the patient was apprehensive with a HR-124/minute, BP-140/98 mm of mercury. A 16 gauge Ryle's tube was positioned and aspirated. The patient was induced with a combination of 200 mg thiopentone, 1.5 mg midazolam and 50 µgm fentanyl IV. Intubation was facilitated with atracurium, 2 minutes after giving 2% xylocard IV. Controlled ventilation was initiated with a tidal volume of 400ml and RR-12/minute. As a routine protocol we used disposable anesthetic circuit but in this case we were more particular because of added risk of infection as the patient was on immunosuppressive therapy. The right internal jugular vein was catheterized with a single lumen catheter for central venous pressure (CVP) guided fluid therapy. Anesthesia was maintained with nitrous oxide, Oxygen and intermittent dose of isoflurane (0.4-2%) was given. Muscle relaxation was achieved with atracurium and analgesia with supplemental dose of fentanyl. IV hydrocortisone (200mg) was given intraoperatively.

The intraoperative course was uneventful. Surgery was completed in 90 minutes with minimal blood loss. Hemodynamic parameters were stable during intraoperative period. 750 ml of Ringer Lactate was replaced during surgery to keep the CVP around 8-10 Cm of water. Inj. lasix (20mg) given IV to achieve adequate urine out put. Intraoperative arterial blood gas (ABG), serum electrolyte and blood sugar analyses were with in normal limits.

The patient was reversed from muscle relaxation with Inj. neostigmine 2 mg and Inj. glycopyrrolate 0.2 mg IV.

In the postoperative period renal function deteriorated slightly. Although the urine out put was around 100ml/hr, the BUN (88 mg%) and serum creatinine (2.6mg%) level were maintained on the higher side. The nitroglycerin infusion was gradually tapered over next four days with the substitution of sublingual nifedipine (10mg). The BUN and serum creatinine levels declined gradually over next 10 days to 56 mg% and 2.4 mg% respectively. There was no major change in serum electrolyte and the serum Na/K level was maintained around 135-140 meq/L and 3.2-4.6 meq/L respectively.

The patient was given intravenous CS-A during perioperative period and the steroids were stopped. The patient was stable and was on regular diet at the time of discharge.

The patient was discharged from the hospital on the 13th post operative day with advice to continue cyclosporine (125 mg), MMF (500 mg bd), nifedipine (20mg tds), prazocin (2.5 mg bd), atenelol (25 mg od) and pantoprazole (40mg od) and advised to get RFT (renal function test) and Total leucocyte count to be done once a week for next one month and once in two weeks for the successive month. The patient is now doing well with normal renal function parameters.

DISCUSSION

One of the greatest challenges for the anesthesiologist is presented by patients who have undergone renal transplant and coming for incidental surgery with insufficient renal function and whose renal function must be preserved during surgery. The whole process becomes trickier when these patients are to be taken up for emergency surgery.

The special perianesthetic consideration in this patients are (i) risk of aspiration, (ii) toxicology of immunosupressant and relevant drug interactions, (iii) risk of infection, (iv) avoidance and curtailment of nephrotoxic insult.

In our case we used combination of ranitidine, ondancetron and ryle's tube aspiration before induction to minimize the risk of aspiration.

The major disadvantage of CS-A was its nephrotoxicity. It decreases the renal blood flow (RBF) and increases the renovascular resistance. Drugs with nephrotoxic side effects potentate its nephrotoxicity. Generalized motor seizure was a serious complication of CS-A therapy. Since the seizure threshold of patients treated with CS-A may be lowered, hyperventilation should be avoided. A well documented side effect of CS-A is hypertension, hyperglycemia and hyperlipidemia. It was therefore prudent to evaluate the cardiovascular system (CVS) carefully for symptomatology of coronary artery disease (CAD)($_2$). The second main components of immunosuppressive protocols were steroids. It was an accepted practice to administer a stress dose of steroids in the intraoperative period to patients receiving chronic steroid therapy ($_3$). In our case we used 200mg of hydrocortisone intra operatively but we stopped it the same in the post operative period because of persistent hypertension and to decrease acid output.

Strict aseptic technique was followed for all the invasive procedure and a broad-spectrum antibiotic coverage was given throughout the perioperative period.

All anesthetic techniques and agents tends to decrease

glomerular filtration rate (GFR) and RBF. However these effects usually resolves rapidly with emergence. Any agents that induce hypotension will result in decrease urine flow. We induced our patients with thiopentone, fentanyl and midazolam in low doses and intubated the patients with atracurium which was the muscle relaxant of choice in patients with compromised renal functions ([4]). Light level anesthesia was maintained with low supplemental dose of fentanyl and Isoflurane as among the commonly available narcotic analgesics the clearance of fentanyl changes little in renal failure ([5]) and isoflurane produces a peak fluoride level of 4μM/L even after prolonged exposure which is far less than toxic fluoride ion level (50 μM/L)([6]). We have not used halothane because of its myocardial depressant effects.

To preserve renal function in the perioperative period, infusion of saline, mannitol, furosemide or low dose dopamine was recommended. As saline or mannitol can lead to fluid overload and myocardial damage ([7]) and dopamine needs careful adjustment with syringe pump, we have used bolus furosemide perioperatively to maintain an adequate urine output. Fluid replacement was administered with CVP as guide line.

The left arm of our patients was well padded on the operating table to ensure that there is no compression of arm because this arm had a brachial fistula. The noninvasive BP cuff was applied to other hand to monitor blood pressure.

To summarize, gastrointestinal complications of transplantation are numerous and potentially catastrophic and mostly occur soon after transplantation or acute graft rejection therapy ([8]). While administering anesthesia to these types of cases the anesthesiologist should pay due attention to the emergency nature of the situation and try to preserve the remaining renal function by avoiding further nephrotoxic insult.

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