
Anaesthesia for renal transplantation

Version 2

Introduction

The following is to provide guidance for the anaesthetic management of renal transplant recipients at St Vincent's hospital.

All renal transplant cases are to have a consultant anaesthetist or senior anaesthetic Fellow in attendance.

Preoperative assessment, Investigations and Preparation

Dialysis

Patients dialysed with haemo/peritoneal dialysis: to be arranged as appropriate by renal team

Diabetes

Commence on sliding scale if diabetic or high BSL

Bloods

Ensure Group and Hold is available

Drugs

Pre-operative drugs prescribed and given on the ward as per renal protocol:

Methylprednisilone (IV) and Cyclosporin/MMF (oral) OR

Tacrolimus/MMF (oral) as per individual patient protocol

Theatres

Cephazolin 2g on induction (or Vancomycin if severe penicillin allergy)

Frusemide 125 mg 5 minutes to reperfusion

Heparin 5000 units subcutaneous intra-operatively & TED stockings

NSAIDs are contraindicated

Monitoring and vascular access

Place routine monitoring including CVP, temperature and nerve stimulator

1. Non-invasive blood pressure cuff should be applied to the non-fistula arm
2. Arterial cannulation is not always indicated. This is to protect any future formation of AV fistula. If there is particular concern re haemodynamic status of patient, then this should be placed in the non-fistula arm
3. A peripheral IV cannula should be placed in the non-fistula arm, 18 g or larger. Avoid forearm and antecubital veins as these need to be preserved for possible future A-V fistula formation
4. Insert a triple lumen RIJ CVP line as per Clinical Resource
 - a. Subclavian venous access is relatively contraindicated. Subsequent thrombosis may make the entire limb unsuitable for A-V fistula formation.

5. Permacath
 - a. If a patient has this in-situ, this can be used for volume replacement, CVP monitoring using a strictly sterile technique.
 - b. Remember these are heparin locked, and heparin must be aspirated before use to avoid systemic anticoagulation.
6. Urinary catheter is placed by the surgeon and urine output should be monitored

Intraoperative management

Patient positioning and theatre preparation

1. The patient is positioned supine
2. If a fistula is present, this should be placed on an arm board and appropriately protected to avoid any compression. Pulse oximetry and a nerve stimulator can be applied to this arm.
3. Use forced air warming and a fluid warmer
4. Use 0.9% NaCl 1L for initial IVI.
 - a. 2-3 L NaCl is commonly used intraoperatively

Anaesthetic Management

1. Consider a rapid sequence induction in those patients with delayed gastric emptying.
 - a. Suxamethonium can be used if necessary, dependent on the patient's potassium level.
 - b. Rocuronium is an alternative, used in conjunction with a nerve stimulator, bearing in mind this can have prolonged neuromuscular blockade.
2. Sevoflurane, cis-atracurium and fentanyl is a commonly used technique.
 - a. Desflurane and Isoflurane can be used safely in renal transplant surgery.
 - b. Cis-atracurium infusion can be used in conjunction with neuromuscular monitoring as the graft is vulnerable to injury if abdominal muscles contract before wound closure
 - c. Fentanyl is an ideal agent for use in renal failure due to lack of active metabolites
3. PCA fentanyl for post-operative analgesia
4. Epidural analgesia is not used due to potential uraemic coagulopathy and potential difficulties in maintaining systolic blood pressure

Intraoperative renal protective measures.

1. Avoid hypotensive episodes, especially immediately pre and post reperfusion.
 - a. No ideal CVP can be recommended, however maintenance of intravascular volume is critical to ensure optimal graft perfusion.
 - b. Timing of volume expansion immediately prior to reperfusion may have a role in early graft function
2. Check K⁺ and Hb immediately pre and post reperfusion as a minimum
 - a. Check more frequently if: cross-clamp time is prolonged, blood transfusion is needed, potassium level > 5.0
3. Blood sugar levels should be checked hourly in diabetics
 - a. A sliding scale of insulin or an infusion used.
 - i. Diabetes is a risk factor for delayed graft function in renal transplantation and hyperglycaemia is associated with ischaemic reperfusion injury

Early postoperative management

1. Maintain the warming status of the patient by use of forced air warming
2. Anaesthetist to contact the renal registrar and give relevant handover

3. Renal registrar to prescribe post-operative fluid orders
4. Electrolytes should be measured as soon as feasibly possible
5. The patient should remain in PACU until haemodynamic status, analgesia, body temperature and potassium levels are normalised

References

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This Clinical Guideline is to be used in conjunction with existing St. Vincent's Hospital and ANZCA Policies.