607FM.1 PROTOCOL FOR ANAESTHETIC AND PAIN MANAGEMENT IN ENHANCED RECOVERY FOR DAY CASE ANTERIOR CRUCIATE LIGAMENT (ACL) RECONSTRUCTION PATIENTS

Introduction and rationale

The purpose of this guideline is to provide a standardised framework for the anaesthetic and pain management of patients undergoing day case anterior cruciate ligament (ACL) reconstruction.

All patients planned to undergo an ACL reconstruction should be included in this programme. Whilst few patients will not be considered good candidates for day case surgery and a planned breach or modification may be considered, all patients will benefit from implementation of the principles of this guideline.

This guideline incorporates the principle of Enhanced Recovery Partnership Programme 'Delivering enhanced recovery - helping patients to get better sooner after surgery' launched by the National Health Service (NHS) Institute for Innovation and Improvement in 2009. The peri-operative management of these patients should aim to include pain control, to facilitate early mobilisation and early return of oral feeding, reduce risks of peri-operative complications and contribute to long term success of the patients' surgery[1]. Importance and influence of the appropriate anaesthetic technique on the above factors has been recognised as a major factor for enhanced recovery and discussed in detail below.

ACL injuries are one of the most common knee injuries, accounting for around 40% of all sport injuries[2]. At Buckinghamshire Healthcare NHS Trust (BHT) a 'Getting it right first time' (GIRFT) review found that between April 2017 and March 2018 the rate of same day discharge for patients undergoing ACL surgery was well below the national average (5% vs 50%). Studies have demonstrated that unexpected admission and complications are low in day case ACL surgery[3]. In addition to patient-specific benefits there are organisational incentives that include reduced cancellation rates and economic benefits[4]. GIRFT data indicates that a minimum of 50% of ACL repairs should be performed as day case.

A recent audit analysed data from all patients undergoing ACL repair at BHT between 1st January and 31st December 2019[5].

- During this period 71 operations were performed.
- Reviewing patient demographics demonstrated that the majority (69%) of patients were male, with a mean average age of 29 years old.
- 78% of injuries were a result of sporting activities.
- 100% of patients had a general anaesthetic (GA).
- 66% had an additional regional anaesthetic block (20% motor sparing block vs 46% motor block).
- Average length of stay was 1.89 days.
- 11.3% (8) of our patients were discharged on the same day including 9.8% (7) that had GA with a motor sparing block and local infiltration while 1.5% (1)] had GA with local infiltration only.

Despite clear data that identifies the possibility of higher rates of day case ACL surgery, BHT is not achieving this target. Increasing our rates of same day discharge will require a multi-disciplinary approach. From an anaesthetic perspective, patients who had a motor sparing block, such as an adductor canal block, were more likely to be discharged home on the same day.

Pre-operative

Ideally, patients having a simple ACL reconstruction should have six weeks between the date a decision is made for surgery and the day of surgery itself. This allows adequate time to maximise the benefit of the interventions required and for the patient to attend an education session with physiotherapy team[6]. During this six-week period all patients should also undergo a pre-operative assessment. Any contraindications to day surgery should be identified and mitigated where possible.

Anaesthetic Technique

The mainstay of intraoperative anaesthetic technique for day case ACL reconstruction is general anaesthesia; combined with adductor canal block (ACB) and local infiltration analgesia. IV dexamethasone (3.3 - 6.6 mg) should be considered at the start of the procedure for its powerful antiemetic effect and beneficial analgesic effects that may reduce post-operative pain[7].

A wealth of evidence and international guidelines support the use of ACB for peri-operative pain control after ACL reconstruction. ACB is a motor sparing field block which mainly blocks the saphenous nerve while passing through adductor canal providing profound analgesia for the medial compartment of the knee and cruciate ligaments[8]. It is well established that ACB is a valuable adjunct for post-operative analgesia for knee surgery[9]. ACB is proven to provide satisfactory peri-operative analgesia for ACL reconstruction[10,11]. **Femoral block is undesirable for day case knee surgery and should be avoided. Persistent motor deficits have been reported at 6 months following femoral nerve block**[12-20].

A combined approach of ACB with local infiltration suitable for ACL reconstruction is recommended below[21-23].

General anaesthetic
- Inhalational or propofol target-controlled infusion (TCI)/remifentanil TCI infusion

Regional anaesthesia (motor sparing block)
- Adductor canal block with 20 ml of 0.25% levobupivacaine (50 mg)

Adjunctive analgesia
- Intravenous paracetamol 1 g (dose 15 mg/kg if <50 kg)
- Short-acting intravenous opiate (fentanyl/alfentanil)

Local anaesthetic periarticular infiltration (performed by surgeon)
- 30 ml 0.25% levobupivacaine with 1 ml 1:1000 adrenaline

Other interventions
- Intravenous fluid 1 litre Hartmann's solution

Local anaesthetic periarticular infiltration administration protocol (performed by surgeon)[24]

Administration:
The local anaesthetic for periarticular infiltration should be prepared under strict aseptic conditions by the scrub nurse.

The constituents of this mixture are 30 ml of 0.25% levobupivicaine (75 mg) with1 ml 1:1000 adrenaline.

The periarticular and the subcutaneous injections are performed by the surgeon using a 20 g spinal needle. The hamstring donor site is also infiltrated.

N.B. This regimen is only valid for patients weighing more than 60 kg. If patient weighs less than 60 kg, the dose should be reduced proportionately. The drugs should be administered with the weight adjustments and at the discretion of the individual clinician.

Post-operative analgesia

All patients should receive intra-operative IV paracetamol 1 g (or 15 mg/kg if patient <50 kg), if not contraindicated. All patients (>50 kg) should have paracetamol (IV or oral) 1 g 6 hourly prescribed in the regular medication section of the drug chart for the post-operative recovery phase. For patients who are <50 kg, paracetamol should be prescribed at 15 mg/kg IV 6 hourly. If non-steroidal anti-inflammatory drugs (NSAIDs) are not contraindicated (see guideline 299FM), they should be prescribed regularly (see below). A dose of short-acting intravenous opiate (e.g. fentanyl) should be prescribed for use in recovery (see guideline 49FM). Oral opiate analgesia should be prescribed for breakthrough pain (see below). Tramadol 50 - 100 mg oral 6 hourly OR codeine phosphate 30 - 60 mg every 6 hours [25,26].

Anti-emetics should be prescribed on the 'as required' section of the drug chart. The prescription for anti-emetics should include ondansetron 4 mg 8 hourly IV/PO and cyclizine 50 mg 8 hourly IV/PO.

All patients should be able to start oral fluids when sufficiently awake in recovery. ACL reconstruction patients who have well controlled pain (VAS <5), who are eating and drinking should be converted to oral analgesia post-operatively in recovery.

Oral analgesia for post-operative pain management

Paracetamol 1 g oral or IV if not tolerating fluids - dose at 15 mg/kg (if <50 kg) every 6 hours.
Ibuprofen 400 mg PO every 6 hours (unless contraindicated - see guideline 299FM).
Codeine phosphate 30 - 60 mg every 6 hours
(consider patient co-morbidities, previous sensitivities, renal function - reduce dose if necessary).
Oral morphine immediate release (IR) 10 – 20 mg PO PRN (4 hourly)
Lansoprazole 15 mg PO OD whilst taking NSAID (if any gastrointestinal risk).

As required: If pain score >5 on movement
Contact anaesthetist if any problems.

Discharge

Adherence to agreed patient-focused discharge criteria shared with the patient prior to surgery should facilitate discharge. It is essential that the patient shares in the decision for discharge and is only discharged when ready. Criteria may vary slightly between hospital sites but, in general, it is expected that patients would:

- Tolerate diet and oral fluids
- Have passed urine
- Be able to mobilise
- Be confident and agree to go home

Patients will aim to be discharged the same day unless pain not adequately controlled, not safe to mobilise, complex surgery or returning from surgery very late.

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See also:
GIRFT Adult Anaesthesia and Peri-operative Medicine Review, Buckinghamshire Healthcare Trust, Provider Level Report Date: 6 February 2019

Bucks formulary and injectables guide (available on the intranet at: http://swanlive/policies-guidelines/bucks-formulary-and-injectables-guide) (BHT users only)

Guideline 49FM Post-operative Analgesic Ladder for Adults

Guideline 216 Guidelines for the Prevention and Management of Post-operative Nausea and Vomiting in Adult Patients >16 Years (BHT users only)

Guideline 299FM Prescribing Non-steroidal Anti-inflammatory Drugs (NSAIDs) in Adults

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Appendix 1: Anaesthetic and Pain Management for Day Case Anterior Cruciate Ligament Repair

Pre-operative:

Ibuprofen 400 mg PO 1 - 2 hours before surgery (check for contraindications)
Lanzoprazole 15 mg PO OD

Peri-operative:

General anaesthestic
- Inhalational or propofol TCI/remifentanil TCI infusion

Regional anaesthesia (motor sparing)
- Adductor canal block with 20 ml of 0.25% levobupivacaine (50 mg)

Adjunctive analgesia
- Intravenous paracetamol 1 g (dose 15 mg/kg if <50 kg)
- Short-acting intravenous opiate (fentanyl/alfentanil)

Local anaesthetic periarticular infiltration (performed by surgeon)
- 30 ml 0.25% levobupivacaine with 1 ml 1:1000 adrenaline. See administration protocol above.

Other interventions
- Intravenous fluid 1 litre Hartmann's solution.

Post-operative:

Paracetamol 1 g oral or intravenously (if nil by mouth - dose at 15 mg/kg if <50 kg) every 6 hours.
Ibuprofen 400 mg PO every 6 hours (see guideline 299FM).
(Consider co-morbidities, previous sensitivities, renal function - reduce dose if necessary.)
Lanzoprazole 15 mg PO OD whilst taking NSAIDs (if any GI risk).
Oral morphine IR 10 – 20 mg PO PRN (4 hourly)

If pain score persistently >5 on movement contact anaesthetist

On ward:

Assess pain scores/side effects.

If pain score <5 on movement:

Advise patients to continue regular
Paracetamol 1 g 6 hourly (if >50 kg)
Ibuprofen 400 mg 6 hourly
Prepare discharge medication
Codeine 30 – 60 mg PO 6 hourly or tramadol 50 – 100 mg PO 6 hourly.