



Outpatient Unicompartmental Knee Arthroplasty

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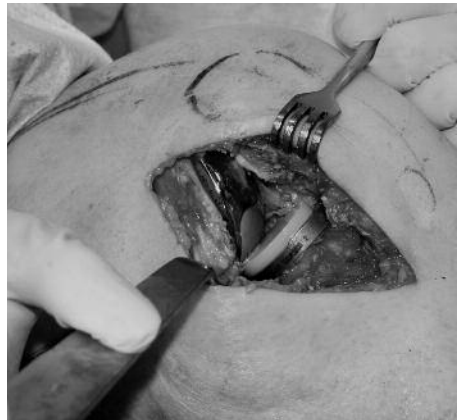
Unicompartmental knee arthroplasty (UKA) in general, provides a faster recovery time than total knee arthroplasty. In fact, some joint surgeons are now performing UKA as an outpatient procedure. The purpose of this paper is to provide clinically proven guidelines for outpatient UKA.

The primary goal is to develop a protocol which allows same-day hospital discharge. There are several factors including operative time, incision length and location, amount of surgical trauma to various components of the knee, general health, blood loss, implant alignment, surgical technique, tourniquet use, and anesthesia which may affect early hospital discharge and improve recovery. Equally important, but much less well understood, is a disciplined and structured program focusing on patient education and patient support. The details presented here are organized into pre-, intra- and post-operative protocols.

Pre-Operative Management

Consistently achieving same-day hospital release following UKA begins with an informed patient. A class or information session prior to surgery can provide patients with a detailed explanation of their symptoms, treatment options and details of the MAKOpasty® procedure as well as what to expect during the recovery process. The time spent with the patients is used to educate patients and answer their questions. During the session, patients are informed about their knee anatomy, osteoarthritic disease in the knee, and indications for a unicompartmental knee arthroplasty (UKA). For MAKOpasty® procedures, pictures and models of the knee joint, robotic arm, and implants

Figure 1. Typical MIS UKA incision.



may be used to provide the patients with visual aids. Patients gain a clear understanding of the procedure and possible alternatives. The individuals who will stay with the patient after surgery, referred to here as caregivers, benefit immensely during these sessions as they will be the ones providing assistance to the patient during their recovery. Dr. John Repicci, who pioneered the concept of MIS UKA provides his patients with handouts of these complete guidelines and the direct contact information of his nurse, who is available 24 hours a day to the patient and is often seen as a "surrogate family member".

Another critical element to successful outpatient UKA is awareness and commitment from the entire surgical staff. This includes the pre-operative planner, anesthesiologists, physical therapists and nurses. The staff providing these key components must be educated and made aware of the accelerated discharge protocol.

Pre-Emptive Analgesia

Inhibiting prostoglandin synthesis before surgery decreases inflammation, reduces pain and speeds recovery. Traditional nonsteroidal anti-inflammatory drugs

Figure 2. Intracapsular anesthetic injection.



are typically contraindicated for surgical or short-term post-traumatic analgesia, however selective cyclooxygenase inhibitors do not inhibit platelets and are recommended here.

- Celebrex (celecoxib) 200mg orally the day before surgery and the morning of surgery
- 20mg Oxycontin (oxycodone HCl) orally the day before surgery and the morning of surgery

Pre-Emptive Anti-Emetics

Blocking histamine and serotonin receptors before surgery prepares the gastrointestinal tract for the insult of anesthesia.

- Reglan (metoclopramide) 10mg orally the morning of surgery
- Pepcid (famotidine) 20mg orally the morning of surgery
- Zofran (ondansetron) 4mg intravenously every 4 hours, the day of surgery

Intra-Operative Management

The operation is planned as an outpatient procedure and patients are educated on the general surgical schedule of events. While, the length of the capsular incision is important (Figure 1), the primary goal is to minimize the trauma to the quadriceps

mechanism and the suprapatellar pouch and to be cognizant of tourniquet pressure and times. Also, the wound should be closed in flexion. Additional goals of intra-operative management are the prevention and treatment of pain, nausea and hypovolemia.

Intra-operative Anesthesia

The anesthetic aspect of the surgical procedure can be a major part of how a patient feels post-operatively and the degree of pain endured before hospital discharge. While it is understood that individuals react differently to anesthesia, the following is recommended.

- Intrathecal morphine: 100mcg with spinal anesthetic agent
- "Big MAC" sedation (Monitored Anesthesia Care): Diprivan (propofol) pump
- Foley catheter
- Intracapsular anesthesia through injection (Figure 2)
 - Ropivacaine 0.2% 40ml
 - Morphine 10mg
 - Ketorolac 30mg
 - Epinehrine 1:1000 0.2cc
- Key sites for injection
 - posterior capsule
 - medial and lateral capsular flaps
 - subcutaneous infiltration following incision
 - pin sites
 - drain site

Blood Management

Because of the associated risks of homologous blood use, several alternative methods are presently used including preoperative blood donation, immediate preoperative hemodilution and intra- and post-operative reinfusion of wound drainage. The technique suggested here is the use of a reinfusion drain with removal after 6 hours.

Post-Operative Management

Motion of the knee joint soon after surgery is critical to an accelerated recovery.

- Early high CPM (0-100° of knee flexion) immediately post-operatively (Figure 3)
- Ambulation as soon as spinal wears off (approximately 2 hours post-operatively)

The patient should be kept well hydrated to prevent postoperative hypotension and nausea. Although it is expected that patients will leave the hospital the same day, patients should

be informed that an extended stay of one or two days is a possibility, depending on patient discomfort or unmet discharge requirements. Patients must understand that they will not be released from the hospital if they do not feel comfortable leaving. The following discharge goals must be met.

- Independent ambulation of 100 feet
- Active straight leg raise (Figure 4)
- Active knee flexion to 90 degrees
- No wound complications
- Adequate pain control with Schedule III (hydrocodone, codeine) oral agents

Figure 3. Active post-operative knee flexion.



Figure 4. Active post-operative straight leg raise.



Discharge Instructions

Formal physical therapy is not required in most cases. Patients are instructed to do the following exercises.

- Walk as much as possible
- Perform straight leg raises, quad sets and ROM exercises 3 times a day. Emphasis should be placed on reaching the extents of knee flexion and extension with these exercises.

Postoperative Pain Management

Primary healing occurs during the first 4 days postoperatively, during which time the following pain management protocol should be established. Around the clock (ATC) dosing takes advantage of the known half lives of both ibuprofen (2 hrs) and hydrocodone (4 hrs).

- 400mg ibuprofen every four hours around the clock for 72 hours, then every 4 to 6 hours as needed
- 5mg hydrocodone every 4 hours around the clock for 72 hours, then every 4 to 6 hours as needed

Secondary, soft tissue healing occurs from the fifth post operative day to the fifth post operative week. Pain management should consist of:

- 400mg ibuprofen four times per day or as needed (may also use NSAID if necessary)
- 5mg hydrocodone every 4 hours as needed for pain

Supplementary Pain Management

Supplemental pain management may be necessary following the completion of secondary healing. For example, twenty percent of patients require an injection of cortisone and marcaine into the MCL or medial joint line at 6 weeks post-operatively for persistent pain.

Conclusion:

The process of an outpatient UKA involves the cooperation and effort of all individuals who interact with the patient. This begins with patient education and setting appropriate expectations prior to

surgery and continues with all aspects of the surgical procedure. Maintaining minimal incisions, preserving muscles and tissues, shortening surgical and anesthesia times, and providing baseline post operative pain medications are concepts requiring special attention from the surgical staff. Dedication to these pre-, intra- and post-operative issues makes outpatient UKA a safe and reliable procedure.

Reference

These data are compiled from a review of the clinical approach of John A. Repicci, M.D. and Thomas M. Coon, M.D.