Day of Surgery Discharge after Unicompartmental Knee Arthroplasty (UKA): An Effective Perioperative Pathway

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Purpose of Study

• Describe a reproducible clinical pathway for day of surgery discharge

• Demonstrate that day of surgery discharge for UKA is a safe change in our goal to achieve efficient care
Methods

Retrospective Review

– 207 Consecutive UKAs
  • 4.95% of Knee Arthroplasty Volume
  • Outpatient Surgery Center from 1/2003 – 2/2011

– Two Cohorts
  • Pre-Transition with Planned Overnight Stay (n=47), Jan 2003 – May 2008
  • Post-Transition with Planned Discharge (n=160), May 2008 – Feb 2011

– Operative Record and Postoperative Chart Review

Methods: UKA Indications

- Medial compartment most common, Lateral 14%
- Symptoms isolated to single compartment
- Non-inflammatory disease
- Deformity < 15 degrees and correctible
- Flexion contracture <15 degrees
- Intact ligaments (ACL, PCL, MCL, LCL)
- X-rays
  - Weight-bearing AP, lateral and skyline views
  - Varus and valgus stress views
UKA Indications: Helpful but Not Necessary

• **MRI**
  – Intact ACL
  – Intact articular cartilage and meniscus unaffected compartments

• **Arthroscopy photos**
  – Recent photos if available
  – Intact articular cartilage and meniscus unaffected compartments
Methods: Preoperative Evaluation/Education

Prior to Surgery:

• Methicillin Resistant Staphylococcus Aureus (MRSA) Screening

• Preoperative Laboratory Data and Urinalysis

• Medical Clearance for all patients
  – ASA Class 1-3

• Cardiology clearance for history of significant cardiac disease

• Preoperative Visit with a Mid-Level Provider
  – Narcotics, antibiotics, sleep aid, NSAIDs, DVT prophylaxis, scopolamine (if history of nausea)
  – Home environment deemed safe and availability of caregiver confirmed
  – Family encouraged to participate
  – Bowel Program

Methods: Anesthesia

- Pre-operative medications
  - Ranitidine 150mg PO, midazolam 2mg, PO Celecoxib 400mg

- General Inhalational Anesthesia (most commonly isoflurane or sevoflurane)

- IV pain medication (morphine 10 mg, fentanyl 100-200 mcg, meperidine 25-50 mg)

- US Guided single injection femoral nerve or adductor canal block

- Standard preoperative antibiotics

Methods: Surgical Technique

• Medial incision without patellar eversion

• Tourniquet utilized from incision to completion of cementing

• Intraoperative local injection of periarticular tissues with 20-40 mL of 0.2% ropivacaine and Toradol

• Single drain, removed in PACU

• Bulky dressing using cotton and bias wrap after skin closure

• Knee immobilizer prior to leaving operating room, cold therapy

Methods: Recovery Room

- Oral (hydrocodone) or IV pain (fentanyl 25-50 mcg) meds as needed
- Last dose IV antibiotics after drain removal and before Discharge Home
- Physical therapist provides gait training and transfer training
- WBAT with FWW or crutches
- Adequate pain control and stable vital signs
- Clearance for DC home by anesthesiologist
- Instructed to wear knee immobilizer until able to do 5 straight leg raises
Methods: Post-Surgical Care

• Phone call by surgeon POD #1-2
• POD #1: home health PT 3x/week for 2 weeks
• Rest, elevate, ice, PO pain meds
• POD #3-4 – 1st office followup visit for dressing change
• 6 weeks postop – 2nd office followup visit
Methods: Outcome Measures

- Knee Society Clinical Rating System (KSCRS)
- Knee Osteoarthritis Outcome Survey (KOOS)
- SF 12
### Results: Patient Demographics

<table>
<thead>
<tr>
<th>D/C POD #1</th>
<th>D/C Day of Surgery (DOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 47 patients</td>
<td>• 160 patients</td>
</tr>
<tr>
<td>• Surgery prior to May 2008</td>
<td>• Surgery May 2008 and after</td>
</tr>
<tr>
<td>• Average age 57.89</td>
<td>• Average age 65.29</td>
</tr>
<tr>
<td>• 58.7% male</td>
<td>• 65% male</td>
</tr>
<tr>
<td>• Average BMI 28.12</td>
<td>• Average BMI 27.72</td>
</tr>
<tr>
<td>• Average ASA 1.81</td>
<td>• Average ASA 1.84</td>
</tr>
</tbody>
</table>

Results: Medial vs. Lateral

• Medial: 146 patients (91.3%)
• Lateral: 10 patients (6.3%)
• Patellofemoral: 4 patients (2.5%)
## Results: Indications for Surgery

<table>
<thead>
<tr>
<th>PRIMARY DIAGNOSIS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSTEOARTHRITIS</td>
<td>90.0%</td>
</tr>
<tr>
<td>POST TRAUMATIC ARTHRITIS</td>
<td>8.8%</td>
</tr>
<tr>
<td>AVASCULAR NECROSIS</td>
<td>0.6%</td>
</tr>
<tr>
<td>SIGNIFICANT MEDIAL OSTEOCHONDRTIS</td>
<td>0.6%</td>
</tr>
</tbody>
</table>
## Results: Surgery Duration & Recovery Time

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration of Surgery (min)</strong></td>
<td>81.0</td>
<td>58-115</td>
</tr>
<tr>
<td><em><em>Recovery Time</em> (min)</em>*</td>
<td>120.9</td>
<td>60-304</td>
</tr>
</tbody>
</table>

*Recovery time is defined as entrance to recovery room until discharge.

*J Arthroplasty. 2014 Mar; 29(3):516-9*
Results: PACU/Recovery Room

- Oral narcotics 8.1%
- IV narcotics 31.9%
- No narcotics 60%
- Average PACU stay was 121 minutes
## Results: Clinical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Preoperative</th>
<th>Final Follow-up</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension</td>
<td>5.67</td>
<td>0.73</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Flexion</td>
<td>124.4</td>
<td>133.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Knee Functional Score (100 = Best Score)</td>
<td>65.3</td>
<td>88.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Knee Society Score (100 = Best Score)</td>
<td>34.2</td>
<td>94.4</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*J Arthroplasty. 2014 Mar; 29(3):516-9*
Results: Complications of DOS Patients

- No intra-op complications
- 2 re-operations
- 1 hematoma POD #6
- 1 wound drainage from drain site - ER visit only
- 1 readmission POD #9 for hypovolemia and UTI

- No admissions to inpatient hospital from PACU
- No falls
- No VTE events
- No MI
- No CVA/TIA
- No infections
- No neurovascular injury
Results: Re-Operations

- 1 patient dislocation of the mobile bearing
- 1 patient with lateral DJD progression and conversion to TKA at year 3
- \( \frac{2}{160} = 1.25\% \)
Study

Strengths

• Large cohort
  – 160 patients compared to 24 and 25 patients in other similar studies

Limitations

• Retrospective review
• Inability to define patient selection criteria
Value of DOS Discharge UKA

• Significant reduction of cost to insurance carriers with day of surgery discharge versus inpatient hospitalization

• Significant cost saving from $16,000 to $7000 noted by Repicci and Eberle
Conclusion

• The success of DOS discharge is a result of multiple factors
  – Strict surgical indications and patient selection
  – Patient and family education
  – Patient support system
  – Surgical and anesthetic techniques
  – Education of perioperative team

• “Safe, efficient care of the UKA patient can be realized by utilizing this simple perioperative pathway”