Outpatient Total Knee Arthroplasty: Anesthetic Implications

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Disclosures

• None
Objectives

- Examine current literature
- Review patient selection criteria
- Anesthetic techniques
- Michigan Medicine’s experience
Overview

• Historical Perspective

• Recent reimbursement/CMS changes

• Today’s Reality = Do more with less
Why should you care?
Enhanced Recovery After Surgery

• Began in Denmark in 1990’s
• Adoption in US began in 2000’s
Is this ERAS?
ERAS

• Pre-surgical clinic visit
• Pre-operative
• Intra-operative
• Post-operative
Outpatient Knee Arthroplasty

- Accelerated clinical pathways
- Improved pain management protocols
- Less invasive surgical technique
- Aggressive rehabilitation
- Increased information available to pts and caregivers
Pre-surgical clinic visit

- Expectation setting/Education
- Pre-surgical optimization
- Discharge planning
  - Assuring appropriate social support and assistance
  - Adequate outpatient PT access
Outpatient Knee Arthroplasty

- Pre-Surgical Optimization
  - Lymphocyte count
  - Albumin levels
  - Pre-albumin levels
  - Transferrin levels
  - Hgb
  - Hgb A1C
Outpatient Knee Arthroplasty

- Appropriate selection does not increase adverse events or complications$^1$-$^4$
- Higher pt satisfaction scores at time of discharge
Outpatient Knee Arthroplasty

• Patient Selection Criteria
  – Critical to success
  – Lack of RCTs
  – Only retrospective reviews
Outpatient Arthroplasty Risk Assessment (OARA) Score

- Medically based risk assessment score
- Retrospective review
- Stratify patients:
  - $\leq 59$ (low-mod)
  - $>60$ (not appropriate)
OARA Score

- 9 comorbidity areas
- Specific conditions scored:
  - Based on presence and/or severity
  - Medical optimization and control
Table 2
QARA Score.

<table>
<thead>
<tr>
<th>Comorbidity Areas</th>
<th>Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>General medical</td>
<td>180</td>
</tr>
<tr>
<td>Hematological</td>
<td>325</td>
</tr>
<tr>
<td>Cardiac</td>
<td>385</td>
</tr>
<tr>
<td>Endocrine</td>
<td>165</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>185</td>
</tr>
<tr>
<td>Neurologic/psychological</td>
<td>185</td>
</tr>
<tr>
<td>Renal/urology</td>
<td>220</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>250</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>65</td>
</tr>
</tbody>
</table>

OARA, Outpatient Arthroplasty Risk Assessment.
OARA Score

• Better predictive value than ASA or CCI

• All-cause readmission rates:
  – POD 0 D/C: 1.8%
  – POD 1 D/C: 2.4%
  – POD 2 D/C: 3.5%
Pre-operative

- Multimodal pre-medication
- Optimal hydration
- Limited foley catheter use
- ? Carbohydrate loading
Intra-operative

—Regional vs General
Regional Anesthesia

Neuraxial and Combined Neuraxial/General Anesthesia Compared to General Anesthesia for Major Truncal and Lower Limb Surgery: A Systematic Review and Meta-analysis

Lauren M. Smith, MD, * Crispiana Cozowicz, MD, †‡ Yoshiaki Uda, MBBS, FANZCA, *
Stavros G. Memtsoudis, MD, PhD, †‡ and Michael J. Barrington, MBBS, FANZCA, PhD*§

- Neuraxial ≠↓ 30-day mortality
- GA may protect against MI compared to neuraxial
- Neuraxial may ↓ surgical site infection, risk of blood transfusion, thromboembolic events & LOS
- Neuraxial alone associated with significantly ↓↓ incidence of pulmonary complications
Regional Anesthesia

Anesthesia Technique and Mortality after Total Hip or Knee Arthroplasty

A Retrospective, Propensity Score–matched Cohort Study

Anahi Perlas, M.D., F.R.C.P.C., Vincent W. S. Chan, M.D., F.R.C.P.C., F.R.C.A.,
Scott Beattie, M.D., F.R.C.P.C.

• Suggested strong association between spinal anesthesia and lower 30-day mortality
• Shorter LOS
• Trend toward lower rates of MACE, PE & blood loss
• No change in rates of MI
Regional Analgesia

- Less narcotic use
- Improved hydration
- Faster ambulation
- Neuraxial & PNB associated with significantly less inpatient falls$^6$
Intra-operative

– Regional vs General
– Non-opioid pain control techniques
  • Multimodal analgesics
  • Muscle sparing regional anesthesia
  • Periarticular injections
– Nausea/Emesis prophylaxis
– Blood loss reduction techniques
– Avoidance of drains
– Avoidance of large volumes of IVF
Post-operative

- Continuation of multi-modal regimen
- Early Mobilization
- VTE prophylaxis
- Rehab program
- Early discharge
Who Should Be Excluded?

Who Should Not Undergo Short Stay Hip and Knee Arthroplasty? Risk Factors Associated With Major Medical Complications Following Primary Total Joint Arthroplasty

P. Maxwell Courtney, MD, Joshua C. Rozell, MD, Christopher M. Melnic, MD, Gwo-Chin Lee, MD

University of Pennsylvania, Department of Orthopaedic Surgery, Penn Presbyterian Medical Center, Philadelphia, Pennsylvania
Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania

Risk factors for developing late (>24 hrs) complications:

• COPD
• CHF
• CAD
• Cirrhosis
Who Should Be Excluded?

Complications Following Outpatient Total Joint Arthroplasty: An Analysis of a National Database

P. Maxwell Courtney, MD a, *, Anthony J. Boniello, MD b, Richard A. Berger, MD a

a Department of Orthopaedic Surgery, Rush University Medical Center, Chicago, Illinois
b Department of Orthopaedic Surgery, Drexel University College of Medicine, Chicago, Illinois

1. Higher risk of readmission:
   - Patients >70
   - Tob hx
   - Malnutrition
   - DM
   - Cardiac hx

2. Outpatient TJA alone did not increase risk of readmission or reoperation
Suggested Exclusions:

• Procedure Based Exclusions:
  – Bilateral procedures
  – Fractures
  – Revisions
  – High Orthopedic complexity
Suggested Physiologic Exclusions:

- Age > 75
- Uncontrolled DM (Hgb A1C > 7)
- BMI > 30
- Known bleeding disorders
- ASA > II
- Poorly controlled cardiac & pulmonary comorbidities
Suggested Physiologic Exclusions:

- Chronic opioid use
- Chronic or ESRD
- Functional neurologic impairments
- Reduced pre-op cognitive abilities
- Severe mobility disorder
- Voiding difficulties/use of urologic medications
- Lack of social support
Suggested Exclusions:

- MI or PE within previous 1 yr
- On anticoagulation
- 3 significant medical conditions
BCSC

• Freestanding ASC
• 4 Operating Rooms
• 6 Short Stay Beds
• Mixed use
Criteria

• Age <70
• BMI ≤ 35
• Resides <100 miles away
• Post-op Home Support
• Daily Opioid usage <50 meq
• ASA for VTE prophylaxis
Criteria

- HgbA1c <7.5
- HTN (1 med)
- Negative OSA screen
- No Cognitive/Neurologic impairment
- No hx of Falls
Criteria

No History of:

– CAD
– COPD
– DVT/PE

– AFib
– Cirrhosis
– Bleeding disorder
– Cardiac Device
Booking

- Pre-Habilitation
- Outpatient post-op PT
- Walker prescription
“Pre-Hab”

- 1-time PT order prior to surgery
  - Conditioning program
  - Walker/cane training
  - Stairs Transfer Training
  - ADL Training
  - Exercises
Day of Surgery

• Pre-op
  – Multimodal Analgesics
    • Acetaminophen
    • Celecoxib
    • Gabapentin
  – Regional Anesthesia
Intra-op TKA

- Spinal
  - Chloroprocaine
  - Dexmedetomidine gtt
- Decadron
- Tordal
- Periarticular LA Injection
- Tranexamic Acid x2
Intra-op THA

- Spinal
  - Mepivacaine
  - Propofol gtt
- Decadron
- Tordal
- Periarticular LA Injection
- Tranexamic Acid x2
Post-op

- Oral Oxycodone
- Tordal
- Transfer to Short Stay unit
- PT visit
- D/C home – Goal within 8 hours
Post-Op

• Outpatient PT
  – Starts POD 1-3
  – Evaluation and Treatment for 4 weeks (3x/wk)
  • AROM, PROM, Quadriceps Strength, Gait training, Balance, Scar Massage, Desensitization, advance to cane as tolerated. Local modalities PRN.
Less is MORE Score
Modified
Outpatient
Risk
Evaluation
Less is MORE Score

• Not published nor in-publication
• Retrospective analysis
Less is MORE Score

• MARCQI
• MVC
• MPOG
Less is MORE Score

• Jan 2017 – Sep 2018
  – Approx. 1500 patients
  – <24 hr stay
  – Using EHR and machine learning
SCOARE

- Society for
- Clinical
- Orthopedic
- Anesthesia,
- Research and
- Education
If interested

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Conclusions

• Communication is a key component to success
• Pt selection plays a significant role
• No single “best” technique
• ERAS protocols yet to be formalized
Questions?
References

Thank You!