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- I have no financial disclosures or conflicts of interest

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PATHOPHYSIOLOGY

A gradual process of destruction and regeneration

Early
- Cartilage loses glistening appearance and begins to thin
- Alteration of collagen fiber structures

Late
- Sclerosis of subchondral bone
- Subchondral cyst formation
- Osteophyte formation
- Joint space collapse

Wheeless
INDICATIONS AND GOALS OF TKA

INDICATIONS
- Severe knee pain and stiffness that limits day to day activity
- Moderate to severe pain at rest and night
- Chronic inflammation and swelling
- Large knee deformities
- Failure to improve with conservative treatment modalities
- Caused by:
  - Osteoarthritis, post-traumatic arthritis, rheumatoid arthritis, or osteonecrosis

GOALS
- Pain reduction
- Improve ROM
- Improve knee stability
- Improve overall knee function for day to day activity

SURGICAL DESCRIPTION

"Preparatory" Procedure:
- Bone Preparation:
  - Damaged articular surfaces of femur, tibia, and patella are removed along with a small amount of subchondral bone.
- Soft tissue removal and balancing:
  - Menisci, cruciate ligaments, excess synovial/capsular tissue removed.
  - Collateral ligaments balanced.
- Positioning of metal implant:
  - Recapit joint surface
  - Cemented or press fit
  - Insert polyethylene spacer
• **Knee Arthroplasty Prevalence 2020**
  - Total Knee Arthroplasty – 995,410
  - Revision Knee Arthroplasty – 75,489
  - Partial Knee Arthroplasty – 51,114

• 24.4% Volume Growth from 2019

• Predicted 1,272,000 total knee arthroplasties per year by 2025

**American Joint Replacement Registry**

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**Preoperative**

**Initial Evaluation**
**HISTORY OF PRESENT ILLNESS**

<table>
<thead>
<tr>
<th>Duration of pain</th>
<th>Quality of pain</th>
<th>Level of activity</th>
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<td>Prior injuries or prior knee surgeries</td>
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  - ex: ACL reconstruction or meniscectomies |
| Aggravating factors and functional limitations |
| Alleviating factors and previous treatment |
  - ex: NSAIDs, bracing, injections, PT |

**MEDICAL HISTORY**

- **Allergies**
  - ex: Nickel
  - Cobalt Chrome ~1% Nickel
  - Titanium 0.1% Nickel

- **Venous thromboembolism risk**
  - History of DVT or PE
  - Treatment for atrial fibrillation or previous VTE

- **Smoking status**

- **Comorbid conditions**
  - BMI < 40
  - Type 2 Diabetes Mellitus – Hgb A1c < 8.0
PHYSICAL EXAMINATION

- Pre-operative ROM
  - Most important predictor of post-operative ROM
- Assessment of cruciate and collateral ligaments
- Identification of flexion contracture
- Gait Assessment
  - “Bow legged” vs “knock kneed”
- Neurovascular assessment
- Exam of ipsilateral hip and contralateral hip and knee

IMAGING STUDIES

AP STANDING VIEW   PA FLEXION VIEW   LATERAL VIEWS

SKYLINE PATELLA VIEW
**IMAGING STUDIES**

### Plain Radiography
- Standing AP
- Standing PA flexion (Rosenberg, Tunnel)
- Weight bearing lateral
- Patellar sunrise

### Optional
- Femur or tibia/fibula views (if prior surgery with hardware)
- Hip to ankle standing alignment views
- Advanced imaging (MRI, CT)
  - usually only done in pre-operative navigation
PREOPERATIVE PATIENT OPTIMIZATION

- Dental Issues
- Antibiotics four weeks prior to surgery
- Smoking cessation
- 90 days prior to surgery
- HbA1c ≤ 7%
- Anemia
- Hypertension
- Hyperglycemic control – HbA1c ≤ 8.0
- Nutrition status
- Alcohol/Drug consumption

PREOPERATIVE EDUCATION
PREOPERATIVE EDUCATION

- Structured preoperative education is associated with better outcomes
  - Reduced length of stay, falls, and post-operative complications
- Patients seen 3-4 weeks prior to surgery in clinic for a thorough preoperative discussion
- Must be active participants in their own care
- Joint coach/family members encouraged to attend all pre-operative and post-operative follow-ups
- Patients also attend “CHI Joint Replacement Class” preoperatively

EDUCATION COMPONENTS

- Preoperative educational booklet given to patient and reviewed at pre-op appointment
- Anesthesia
  - Spinal vs General Anesthesia
- Physical therapy
  - Outpatient vs HHC
  - Rx given to patient at time of pre-op appointment and PT set up prior to surgery
- VTE prevention
  - ASA 81 mg BID if not currently taking anticoagulants
- Discharge needs and goals
  - SNF
- Postoperative care
  - Pain control
  - Dressing and wound care
  - DME – Continuous Passive Motion Machine, Cryotherapy
  - Home exercise program and PT
PATIENT TO BE SEEN NO MORE THAN 30 DAYS PRIOR TO SURGERY
FOR PREOPERATIVE HISTORY AND PHYSICAL WITH PRIMARY CARE

- CBC
- CMP
- Hgb A1c
- UA
- ALBUMIN
- EKG
- CHEST X-RAY

MAY ALSO NEED CLEARANCE FROM OTHER MEDICAL
SUBSPECIALTIES

- EX: CARDIOLOGY: ECHOCARDIOGRAPHY,
ANTICOAGULATION

DENTAL WORK COMPLETED PRIOR TO SURGERY

PREOPERATIVE AND INTRAOPERATIVE CARE

- MULTIMODAL PAIN PROTOCOL TO INCLUDE
  - ADDUCTOR LONGUS BLOCK
  - CÉLEXOCEPT 1000 MG PO
  - GABAPENTIN 400 MG PO
  - ACETAMINOPHEN 1G PO VS IV
  - PERITUBULAR INFILTRATION
  - TRANSEXAMIC ACID
  - IV ANTIBIOTICS PRIOR TO INCISION
PERIOPERATIVE CARE

- Continuation of multimodal pain management
- Early mobilization
- Initiation of Foot Pumps vs SCDs for mechanical DVT prophylaxis
- Initiation of DVT chemoprophylaxis
- Start CPM and cryotherapy
- Incentive spirometry
DISCHARGE PROCESS

- MIRROR/HYGIENE DISCUSSION
- EDUCATE FAMILY MEMBERS TO BE PRESENT
- PROTOCOL TO FOLLOW Vs SCHEDULED DATE OF DISCHARGE
- REVIEW POSTOPERATIVE DRESSING SCHEDULED
  - OVERNIGHT VS HOSPITAL
- EXPLANATION OF DME
  - CPM DELIVERED TO HOME OF HOSPITAL AND PATIENT EDUCATED ON USE
  - COLD THERAPY – BREG POLAR CARE COLD

DRESSING CARE

- INSTRUCTED ON DURATION OF POSTOPERATIVE COMPRESSIVE DRESSING
- THIGH HIGH COMPRESSION HOSE USE
  - USED ON BILATERAL LOWER EXTREMITIES
  - USE FOR 6 WEEKS, OFF AT NIGHT
- EDUCATION ON PICO DRESSING
  - SHOWERING IS FINE, BUT BATTERY PACK MUST BE DISCONNECTED
  - DISCUSS ALARMS AND WHEN TO CONTACT OFFICE
**DISCHARGE PROCESS**

- Discharge Medications
  - Resume home meds unless instructed differently by PMS or PCP
  - DVT Prophylaxis
    - If no prior anticoagulation, ASA 81 and 325 for 6 weeks
    - If prior anticoagulation, may modify OR resume home dose
    - Enbrel may bridge with Coumadin Therapy
      - INR managed by PCP postoperatively
  - Postoperative Pain Medication
    - tramadol, hydrocodone (APAP), oxycodone (APAP)
    - OK for NSAIAD use unless on chronic anticoagulation
    - OK for acetaminophen if combination orally not being used
    - Chloroquine vs metamizole for antipyrine
  - Antiplatelet Medication
    - clopidogrel, 75mg

**POSTOPERATIVE CARE**

- Postoperative calls made by orthopedic team and nurse navigator one to two days after discharge
- Re-emphasize all aspects of discharge plans
- If patient discharged to SNF or home care, discuss discharge plan with nursing staff
- Patients encouraged to call with any questions or concerns
POSTOPERATIVE FOLLOW-UPS

• One week postoperative follow-up
  • Dressing change and wound check
  • ROM Check
  • Discuss Medications
    • Taking Anticoagulants as directed
    • Address any medication refills
• Two week postoperative follow-up
  • Wound check and staple removal if present
  • Two week x-rays
  • ROM Check
  • Discuss Medications

POSTOPERATIVE FOLLOW-UPS

• Patient also seen at 4-6 weeks postoperatively depending on ROM/PT progress
  • If struggling with ROM may need to consider manipulation under anesthesia
• Patient seen at 3 months postoperatively
  • New x-rays obtained
  • Allow patient to return to activity as tolerated
    • Avoid activities like running, jumping → creates shear forces on polyethylene spacer
    • Open to kneeling
  • Discuss future dental care and prophylaxis
LONG TERM FOLLOW-UP

- Patient seen at one year, two years, five years, ten years postoperatively
- Serial radiography obtained to evaluate polyethylene wear, alignment of implants
THANK YOU!

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