Advancements in Total Knee Arthroplasty

Andrew Brooks, M.D., Orthopedic Surgeon
Director, NorthBay Joint Replacement Program
at NorthBay VacaValley Hospital
Conservative Treatment

- Analgesics
  - Acetaminophen
  - Tramadol
- NSAIDs
Conservative Treatment

- Topical
  - Voltaren patch
  - Lidocaine patch
  - Ben Gay, Icy Hot, Capsaicin (Zostrix)
Conservative Treatment

- **Braces**
  - Neoprene, elastic sleeve, arthritis unloader

- **Ambulatory aids**
  - cane ↓ forces by 50%

- **Acupuncture / D.C.**
  - No clear evidence over placebo
Conservative Treatment

- Exercise/physical Therapy
  - Numerous studies
  - Maintain ROM, balance, and strength
  - Maintain independence, ADL’s
Conservative Treatment

- Intraarticular steroids
- Viscosupplementation
  - Hyaluronic Acid
    - Component of synovial fluid
    - Depleted in OA
When should you consider surgery?

- Simple everyday tasks are painful
- Pain prevents sleep
- Non-surgical treatments don’t relieve pain
- Chronic knee inflammation/swelling and stiffness do not improve with rest or meds
- Knee deformity
- Inability to tolerate, or complications from pain meds
Surgical Treatment

- Arthroscopy
- Osteotomy
- Total Knee Arthroplasty (TKA)
- Unicompartmental Knee Arthroplasty (UKA or Partial knee replacement)
Total Joint Replacement

- Extremely successful at decreasing pain and increasing function
  - 80% of THA survive 20 years
  - 90% of TKA survive 20 years

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<tr>
<th>Year</th>
<th>TKA #</th>
<th>THA #</th>
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<tbody>
<tr>
<td>1990</td>
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<td>105,000</td>
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<tr>
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<td>2030 est.</td>
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Total Knee Arthroplasty

Normal knee

Osteoarthritic knee

NorthBay.org
Total Knee Arthroplasty
Total Knee Arthroplasty
Advances in TKA

- 1968: First “Modern” TKA performed
- 2015
  - Decrease in pain
  - Decrease in time for recovery
  - Decrease in complications
  - Increase in Arthroplasty Longevity

Patient Satisfaction
Decreasing Pain

- Multi modal pain control
  - Small doses multiple medications decrease total narcotic dose
  - Nerve blocks
  - Intraoperative injections
Accelerate Recovery

- Early mobilization
- Aggressive physical therapy
- Early discharge
Decrease Complications

- **Pre-op**
  - medical/dental clearance
  - Staph screening/treatment
  - Patient education

- **Intra-op**
  - Improved surgical technique
  - “Patient specific” instruments

  “Customized” knee replacements
TKA: Patient Specific Instruments

Customized instruments are developed for each patient
Differences in each patient’s bone shape influence how a knee replacement fits the body

Uses MRI to develop 3D models of each patient’s exact knee anatomy
TKA: Patient Specific Instruments
Increase Arthroplasty Longevity

- Material Design
  - Titanium
  - Chrome – Cobalt
  - Ceramic (hip)

- Plastic (Polyethylene) liner
  - Reduce wear
  - Reduce friction
  - Vitamin E
NorthBay Joint Replacement Program

at NorthBay VacaValley Hospital

- Began 2007
- Philosophy
  - Optimize outcome
  - Accelerate recovery
  - Decrease complications
- Protocols Developed from prior experience and evidence based medicine individualized for each patient
NorthBay Joint Replacement Program

at NorthBay VacaValley Hospital

- Comprehensive program
- Pre–operative program
  - Education, pre–surgery class
- Team of experts
- Pain control techniques
- Rapid rehab and recovery
  - Early discharge home
  - Outpatient Partial Knee Replacement (January 2013)
NorthBay Joint Replacement Program
at NorthBay VacaValley Hospital

Cynthia Giaquinto, RN, ONC
Program Manager, Orthopedics

- Nationally Certified in Orthopedic Nursing
- NorthBay Healthcare employee for 29 years
- Opened JRP in August 2007
NorthBay Joint Replacement Program at NorthBay VacaValley Hospital

- **2011**: American Joint Replacement Registry
- **2013**: Joint Commission Disease Specific Certification for Hip and Knee Replacement
- **2014**: Magnet Designation Award for Nursing
Unicompartmental Knee Arthroplasty

Indications:

- Arthritis (AVN) limited to one compartment
- Intact ligaments
- No inflammatory arthritis

~5-6% of patients with knee OA
UKA: Advantages

- Lower peri-operative morbidity
- Minimally Invasive
- Accelerated Rehab/Recovery
- Increase in patient satisfaction
UKA

Before

After
UKA

- Outpatient surgery possible
  - Minimally invasive surgery
  - Pain control techniques
    - Pre-emptive analgesia
    - Multi-modal analgesia
    - Peripheral nerve blocks
    - Peri-articular injections
  - Pre-op education classes
Meet Our Patient Panel

- Pat Dennis
- Craig Keller
- Marline Mortensen
- Mitchel Williams
Thank You!

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