Contraindications to Outpatient Arthroplasty

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Process optimization

Spinning Jenny 1764

Process optimization

Optimized OR
Process optimization

- Effectivity = Doing the right things
- Efficiency = Do the right things right

Need for optimization in Arthroplasty

- Patient selection/preparation
- Perioperative management
- Postoperative treatment

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Indication

• 75 % satisfied / 25 % unsatisfied after TKA
• Predictors for satisfaction:
  • Age < 60
  • symptoms-free
  • good function
• Fulfill the expectations

“Satisfaction with TKR is primarily determined by patients’ expectations, and not their absolute level of function.” Noble PC, CORR 2006

Patient education

Preoperative patient condition

• Restrospektive study n = 714 TKA
• HbA1c > 8 (6.1-risk risk for wound infections)

→ Perioperative optimization ?!
Anemia

- Prevalence before surgery 20-51%
  Kendoff et al., Orthopaede 2011
  Rosencher et al., Transfusion 2003
  Theusinger et al., Anesthesiology 2007

- After Surgery ca. 97% (THA/TKA)

- Definition (WHO):
  m: Hb < 13g/dl / Hct < 39%
  w: Hb < 12g/dl / Hct < 36%

Anemia - consequences

- Increased transfusion rate (ASA III/IV)
  OR 3,8 pro g Hb < 13g/dl
- Morbidity
- Mortality
- Hospital stay
- Rate of readmission
  Lasocki et al., E J Anaesth 2015
  Basora et al., Vox Sang 2014
  Jans et al., Transfusion 2014

Anemia - therapy

- 4 weeks preop
- 1000mg Fe-Carboxymaltose i.v.
- 40,000 IU EPO-alpha s.c.
- 1mg Vit B12 s.c.
- 5mg folic acid/d p.o.

→ Reduction of preoperative anemia
→ Reduction of postoperative transfusion rate

Theusinger et al., Blood Trans 2014
Need for optimization in Arthroplasty

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Less traumatic surgery

Sufficient anaesthesia/pain management
Tranexam-acid

- 1968 first drug approval in Switzerland
- Decrease of blood loss (i.v./i.a.)
- No increased risk profile

→ Safe and efficient for primary TKA/THA

Whiting et al., JOA 2015
Husted H, Acta Orthop 2014
Aguilera et al, AOTS 2015

Tranexam-acid

- Revision
- Single dose i.v. (20mg/kg)
- Reduction of tranfusion rate from 30% to 17% (p<0.001)
- No specific complications

→ Safe and effective in revision arthroplasty

Smit et al., J Arthroplasty 2013
Aguilera et al., Acta Orthop Belg 2012

Tourniquet should not be opened for hemostasis

- Lotke PA, JBJS Am. 1991
- Burkart BC, Clin Orthop. 1994
- Jorn LP, Acta Orth Scand. 1999
- Hersekli MA, Int Orthop. 2004
- Christodoulou AG, Knee 2004
- Huang Z, Orthopedics 2015

Blood loss ↑

Slaying evidence
Need for optimization in Arthroplasty

- Patient preparation
- Perioperative management
- Postoperative treatment

„Rapid Recovery“ program

- Early mobilisation
  - Adapted physical therapy und rehabilitation
  - Adapted pain management

→ Improved functional outcome
→ Decreased morbidity
→ Decreased hospital stay
→ No increased complication rate
→ No increased readmission rate

„Rapid Recovery“ program

- Preoperative patient instruction
- Perioperative management
- Modification Management (LIA, TXA, no drain, etc.)
- Mobilization same day
- Intensive physical therapy

Khelet et al., Lancet 2013
Lamplot et al., JOA 2014
Shorter hospital stay

- With multimodal concept reduction (2-4 days) possible
- Cave! Modus of discharge different in studies (rehab vs. Medic-Hotel vs. discharge)

Kehlet et al., Lancet 2013
Kehlet et al., Knee 2013

- Cave! Financial stimuli
- Current DRG-system counterproductive
- < 3 days (risk for decreased reimbursement)

Functional outcome

- Define parameters
- Extension at discharge is predictor for extension 1 year after surgery.

→ Extension is the crucial criteria

Naylor et al., Eval Clin Pract, 2012

Decrease of morbidity

- Immediate mobilization vs. bedrest
- Multiple RCTs

→ Up to 30-fold reduction of DVT-risk

Husted et al., Acta Orthop 2014
Pearse et al., JBR 2007
Chandrasekaran et al., ANZ J Surg 2009
Husted et al., Acta Orthop 2010

→ Decrease of morbidity rate

Kehlet et al., Knee 2013
Malvia et al., Acta Orthop 2011
McDonald et al., Knee 2012
Jörgensen et al., Br J Anaesth 2013
Cost effectiveness

- Compared to the 3–4 day standard-stay group, the costs at 2 years were:
  - $8527 (lower) for the outpatient group
  - $1967 (lower) for the 1–2 day group
  - $1159 (higher) for the 5+ day group.

Lovald et al., J Arthroplasty 2014

Adverse effects

- No increased general complication rate
- No increased unplanned readmission rate

Kehlet et al., Lancet 2013
Kehlet et al., Knee 2013
Husted et al., AOTS 2010

- NO increased specific complication rate
  (infection, loosening, manipulation under anaesthesia)

Wied et al., Knee 2015
Berger et al. J Arthroplasty 2005

Difficulties for widespread implementation

- Diversity of hospital settings
- Inadequate staffing of wards
- Use of opioid-based analgesia regimens
- Insufficient postoperative mobilisation
- Absence of well defined discharge criteria,
- Suboptimum preoperative patient information

Kehlet et al., Lancet 2013
Contraindications

- History within 1 year of myocardial infarction, pulmonary embolism
- Patients on anticoagulation therapy
- Significant obesity (body mass index, N 40)
- 3 or more significant medical comorbidities

Selection criteria

- Medicare Data Set patients with a TKA between 1997 and 2009
- 71,341 3–4 day standard-stay patients, 23,134 5+ day, 7755 1–2 day, and 454 outpatient patients
- Short stay patients in this study are younger and healthier, and thus patient selection, hospital specialization, and appropriate follow-up protocol continue to be suggested as key elements to a successful early discharge program.

Selection criteria

Lovald et al., J Arthroplasty 2014
**Readmission after arthroplasty**

- 6538 patients who underwent TKA or THA between 2006 and 2010
- The overall 90-day readmission rate was 7.8%
- Most common readmission diagnoses were related to infection and procedure-related complications
- Increased likelihood of readmission was found with coronary artery disease, diabetes, increased LOS, underweight status, obese status, age (over 80 or under 50) and Medicare

**Readmission after arthroplasty**

- 11,814 and 8105 patients who underwent primary TKA and THA from 2011
- Readmission rates within 30-days of surgery were 4.6% for TKA and 4.2% for THA
- Increased likelihood of readmission was found in TKA with age, male gender, cancer history, elevated BUN, a bleeding disorder and high ASA class
- In THA obesity, steroid use, a bleeding disorder, dependent functional status and high ASA class

- The outpatient and 1–2 day stay groups reported less pain and stiffness
- The 1–2 day group also had a higher risk for revision

Lovald et al., J Arthroplasty 2014
Risk factors for outpatient TJA

- 1012 consecutive patients undergoing elective primary hip and knee arthroplasties
- 70 complications (6.9%) requiring additional physician interventions occurred following surgery
- Most major medical complications requiring additional physician interventions occur greater than 24 hours
- Patients with history of COPD, CHF, CAD, and cirrhosis should not undergo short stay or outpatient TJA

Needs for fast track arthroplasty

- Specific selection criteria
- Specific discharge criteria
- Proper less invasive technique
- Multi disciplinary collaboration
- (anaesthesiologists, surgeons, nurses, and physiotherapists)
- Monitoring of data, and adjustment of the programme on the basis of scientific evidence
Conclusion

• Sufficient potential for further process optimization and outpatient surgery in THA/TKA arthroplasty
• Key is patient selection, hospital specialization, and appropriate follow-up protocol
• Contraindication are CHF, CAD, Cirrhosis, COPD ...
• Preoperative preparation of patient (education, metabolism, anemia, physical therapy)
• Perioperative setting (MIS, TXA, LIA, regional anaesthesia)
• Postoperative management (mobilization, pain management)

True outpatient arthroplasty

Thank you!