

Total Joint Replacement and Chronic Pain

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EVIDENCE-BASED ORTHOPAEDICS

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Indications for TJR

No hard rules/”magic number”

Moderate consensus(for ortho surgeons):

- **Pain** – severe, rest/night, activity-limiting daily, progressive
- **Disability** – “significant” impairment of wt.bearing activities and ADL
- **Radiology** – correlation between XR & Sx poor, but preferred

Additional factors to consider..

- Mono-articular/polyarticular disease
- Hip vs knee
- Age
- Expectations
- Comorbidities
- Motivation/psycho-social factors
- Gender(?)

Hip vs Knee

Patient Perspective Survey of Total Hip vs Total Knee Replacement Surgery

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Survey Responses: Pain

	THA	TKA	
Preoperative	Mean (SD)	Mean (SD)	P-value
Severity of pain	7.9 (2.5)	8.2 (2.2)	0.151
Severity of disability	7.3 (2.5)	7.9 (2.1)	0.002

VAS scale – 0=no pain/disability, 10=extreme pain/disability

	THA	TKA	
In-Hospital	Mean (SD)	Mean (SD)	P-value
Postoperative pain	5.0 (2.9)	5.5 (2.7)	0.002
Difficulty to begin walking	4.0 (2.7)	5.2 (2.7)	0.000

Survey Responses

Overall satisfaction with TJR meeting preoperative expectations for:

	THA Mean (SD)	TKA Mean (SD)	P-value
Pain relief	8.6 (2.2)	8.7 (5.1)	0.843
Improvement in function	8.1 (2.5)	7.7 (2.5)	0.125
Improvement in range of motion	8.4 (2.1)	7.7 (2.7)	0.003
Improvement in quality of life	8.5 (2.3)	7.9 (2.7)	0.021

VAS scale – 0=not satisfied, 10=extremely satisfied

THA vs TKA

- THA's trend to higher satisfaction cf. knees despite equivalent pain relief
- THA's achieved greater change in score as measured by Oxford scores
- THA is more likely to "feel normal" cf TKA

Conclusions

- THA's trend to higher satisfaction cf. knees despite equivalent pain relief
- THA's achieved greater change as measured by Oxford scores
- THA is more likely to "feel normal" cf TKA
- Hips are happier, knees have more "issues"

Predictive factors for Outcomes

- Polyarticular disease
 - inferior functional outcomes
 - no described impact on pain
- Early (XR grade) OA
 - higher risk of PPOP & dissatisfaction with overall outcome (Polkowski et al CORR Jan 2013)

Predictive factors for Outcomes

- Comorbidities – negative impact on outcomes especially function
- Age
 - younger (<55)- better scores/objective outcomes but inferior satisfaction
(Williams et al JBJS 2013)
 - ?expectations?

Patient expectations/satisfaction

- Multiple studies – similar findings
- \pm 85 -90% pts expectations (largely) fulfilled (hips>knees)
- \pm 80-85% pts satisfied overall
- 80% satisfied with functional outcome
- 87% satisfied with pain relief

Nisdotter et al 2009

Patient expectations/satisfaction

- Discordance in TKA expectations between patients and surgeons
- 37% pts (esp. females) have higher expectations re outcomes of surgeon

Ghomrawi, Mancuso et al CORR Jan 2013

Patient expectations/satisfaction

How do we do??

Outcomes

Health-related quality of life in total hip and total knee arthroplasty. A qualitative and systematic review.

Ethgen et al JBJS May 2004

- Overall both highly effective procedures
- Pts with poorer preop QoL more likely to experience greater improvement (change in score) but inferior ultimate/absolute scores

Global HAG Database

Oxford Hip/Knee Score

Oxford Hip/Knee Score abstracted from global database including data on 6376 primary THA/TKA cases performed at one site, among 6 surgeons between September 1998 and December 2007.

	THA	TKA	
	Mean (SD)	Mean (SD)	P-value
Preoperative Oxford	42.8 (7.8)	40.5 (7.6)	0.000
1-year Oxford	20.3 (8)	23.9 (8.6)	0.000
Oxford Change Score (Preop – 1year)	-22.5 (9.7)	-16.6 (9.5)	0.000

Not the full picture...

- Despite unremarkable clinical or radiographic findings it has been reported that 10-30% of TKA patients experience minimal or no improvement after surgery - persistent pain = major issue

(Hawker GA et al, JBJS-Am 80(2);1998; Robertsson O et al, Acta Orthop Scand 71(3);2000; Noble, CORR 452;2006; Gandhi R et al, J Rheumatol 35(12);2008)

Oxford Hip/Knee Pain Score (Hip vs Knee study) 1 Year Pain Compared to Preop Pain

Oxford Pain	THA	TKA	P-value
1yr Pain <u>Better than</u> Preop Pain	95.5%	86.4%	0.034
1yr Pain <u>Same as</u> Preop Pain	3.4%	12.5%	0.024
1yr Pain <u>Worse than</u> Preop Pain	1.1%	1.1%	0.994
1yr Pain <u>Same as or Worse than</u> Preop Pain	4.5%	13.6%	0.034

HAG Database 5 yr “Snapshot”

1106 1°THA – 111 (10%) 1yr pain rating same
or worse cf preop
55% of these improved by 5yrs

1963 1°TKA – 234 (12%) 1yr pain rating same
or worse cf preop
45% of these improved by 5yrs

Negative Predictors for Pain relief post-TKA?

- OA cf RA
- Poorer S/E status
- Anxiety/depression
- Low self-efficacy
- Pain catastrophizing/poor pain coping strategies
- Chronic Opioid use
- Chronic pain
- WSIB/Medico-legal litigation

Age, gender – impact
function not pain
BMI not significant
predictor of outcomes

Painful TJR??

- Hips – can usually find an organic cause
back, infection, loosening, soft tissue
impingement etc
- Knees – take longer than hips to reach MMR
multiple potential organic pathologies
true incidence of PPOP unknown - 6-12%?

Painful TKA – Organic pathology

- “Referred” pain – hip/spine/PVD
- Infection
- Loosening/fixation failure
- Malalignment
- Instability
- Patellar AVN
- Sensory neuromata
- RSD

- PPOP – no clear organic pathology identified

Persistent Postop. Pain

WSIB/Med-Legal litigation

- Well established that see $\pm 50\%$ reduction in all outcome measures including pain
- More than doubles recovery time
- Complex – resentment/hostility etc
conflict – monetary vs medical

Persistent Postop. Pain

Pain Catastrophizing

Strong association with PPOP Vissers et al 2012,
Sullivan et al 2011,

Preop PCS scores predictive of PPOP Forsythe et al 2008,
Riddle et al 2010

Somewhat complex – associated with worry,
anxiety, helplessness, symptom magnification,
low mental health

Persistent Postop. Pain

Pain Catastrophizing

Recent pilot study - improved TKA outcomes (decreased severity of postop pain, decreased PPOP and improved function) with psychologist-directed preop. pain coping skills training intervention

Riddle et al 2011

Persistent Postop. Pain

Self-efficacy:

Predicts function not pain Wylde et al 2012

Anxiety and depression:

Affect pain & function at 1 year – resolves by 5 yrs
i.e. slows recovery but not clearly associated with true PPOP

Fibromyalgia:

Controversial impact – D'Abruzzo et al 2012 - Yes

Bican et al 2011 - No

Persistent Postop. Pain Central sensitization?

Singh et al 2008 - High preop pain predictive of PPOP

Lundblad et al 2008 – PPOP associated with high preop pain VAS and low pain threshold - ? Central sensitization?

Arendt-Nielsen et al 2010 – clear evidence of central sensitization in pts with OA knee and high self-reported pain levels

Persistent Postop. Pain Chronic Pain?

Wylde et al 2011 - Increased PPOP in pts with history of preop. chronic pain elsewhere
? Inherent vulnerability?

Liu et al 2012 – Chronic pain elsewhere independent risk factor for PPOP

Persistent Postop. Pain Chronic Opioids?

Chu et al 2006 – risk of tolerance and hyperalgesia with
chronic opioid use

Zywiell et al JBJS 2011 - Chronic opioid use prior to TKA
cf. matched controls

Stat. signif. - increased LoS
increased PPOP
unexplained stiffness
increased reoperation rate (all causes)

Persistent Postop. Pain Prevention??

Psychological screening and preop intervention ?

Periop pregabalin ? – PRCT – decreased opioids

postop plus ? decreased PPOP (Buvanendran et al 2010)

Low dose IV ketamine I/Op?

Persistent Postop. Pain

- A greater problem than previously thought in TJR patients
- Multiple predisposing factors
- Area of current and future (planned) research

Thank You

