

PE exchange and soft tissue procedure : does it make sense?

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Case

- Male, 69yo
- ROM : 0-10°-100°
- 122Kg, 174cm (BMI=40)





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Case

Day 7!









Ligament balancing + Liner exchange 9 to 15mm









Treatment Options

- Isolated liner exchange
- Single component revision
- Full component revision
- Hinge arthroplasty



Liner Exchange

- Attractive low morbidity option
- Minimizes morbidity of revision surgery
- When does it work?

Polyethylene exchange only for prosthetic knee instability. Brooks et al. CORR 2002



Requirement 1: Complete Preoperative Evaluation

- Clinical Examination
- AP & lateral views
- Skyline patella views
- Long leg films X-Rays
- Stress X-Rays (varus valgus, A/P)
- +/- CT-Scan







Requirement 2: Classification & Etiology

EXTENSION INSTABILITY

Extension Gap Problem

GLOBAL INSTABILITY

Multiple Planes

FLEXION INSTABILITY

Flexion Gap Problem

MIDFLEXION INSTABILITY

Laxity 30-60°

Requirement 3: Components

1. Stable fixation

2. Proper axial alignment



Requirement 4: Differential diagnosis

1. No Infection

2. No Ext. mechanism disrupture

3. No wear



Requirement 5: Surgical report & prosthesis details

1. Can you change the liner?

2. Do you have the appropriate liner?

3. Modularity and continuum of constraint?



Posterior-Stabilized Constrained Total Knee Arthroplasty for Complex Primary Cases. Lombardi AV et al. JBJS (Am) 2007

GLOBAL INSTABILITY

Multiple Planes





Over-Resection of tibia

- Well balanced in flexion and extension
- Symmetric instability
- Isolated liner exchange may work



Pagnano et al. Flexion instability after primary posterior cruciate retaining TKA. Clin Orthop 1998

FLEXION INSTABILITY

PCL Insufficiency

Availability of ultra congruent anterior constrained PE?



EXTENSION INSTABILITY

Var/Valgus Imbalance

- Rebalance ligaments
- Soft tissue release on concave side
 Liner Thickness

Caution! Gap imbalance may require a femoral revision or constrained implant

Principles of ligament balancing in RTKA

- Complete concave releases
- Equalize flexion extension gaps
- Recreate the joint line
- +/- Tighten the convex side





Clin Orthop Relat Res (2010) 468:96–101 DOI 10.1007/s11999-009-1023-3

SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL MEETINGS OF THE KNEE SOCIETY

Isolated Tibial Polyethylene Insert Exchange Outcomes After Total Knee Arthroplasty

Seann E. Willson MD, Michelle L. Munro BS, Julie C. Sandwell MPHc, Kace A. Ezzet MD, Clifford W. Colwell Jr. MD

Table 3. Reported ITPIE outcomes

Authors Diagnosis		Number of patients	Followup time (average)	Failure rate	
Babis et al. [1]	Instability	27	5.8 years	44% revised or painful	
Babis et al. [1]	Multiple	56	4.6 years	25% revised	
Babis et al. [2]	Stiffness	7	4.2 years	86% revised or painful	
Brooks et al. [4]	Instability	14	56 months	29% unstable	
Engh et al. [5]	Wear	48	7.4 years	17% revised	
Engh et al. [5]	Severe wear	22	less than 5 yrs	27% revised	
Griffin et al. [6]	Wear/lysis	68	3.6 years	16% revised or lysis	
Jensen et al. [8]	Multiple	27	40 months	15% revised	
Current study	Multiple	42	5.6 years	29% revised and 21% painfu	

ITPIE = Isolated tibial polyethylene insert exchange.

CLINICAL ORTHOPAEDICS AND RELATED RESEARCH Number 405, pp. 182–188 © 2002 Lippincott Williams & Wilkins, Inc.

Polyethylene Exchange Only for Prosthetic Knee Instability

D. Hodari Brooks, MD; Thomas K. Fehring, MD; William L. Griffin, MD; J. Bohannon Mason, MD; and Thomas H. McCoy, MD

- 47 rTKA for tibiofemoral instability
- 14 isolated liner exchange
- Mean increase of liner thickness of 5.7mm
- Success : 10/14 (71%)
- F/E gaps imbalance

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The Effectiveness of Isolated Tibial Insert Exchange in Revision Total Knee Arthroplasty

BY GEORGE C. BABIS, MD, ROBERT T. TROUSDALE, MD, AND BERNARD F. MORREY, MD

Investigation performed at the Mayo Clinic and Mayo Foundation, Rochester, Minnesota

• n=27

- Mean increase of 4.3mm
- Success in 15/27 (55%)
- Failure at 3y (0.6-6.4)

TABLE I Results of Isolated Insert Exchange According to the Indication for the Revision

	Total No. of	No. o Knees	f Failed (N = 21)	No. of Surviving	Knee Society Knee Score for Surviving Knees (points)	
Indication	Knees (N = 56)	Rerevised	Severe Pain	Knees (N = 35) for		
Instability	27	8	4	15†	80 (50-100)	
Wear	24	5 (+1*)	2	16 †	87 (33-99)	
Other	5	1	-	4	89 (67-97)	

*Above-the-knee amputation was performed because of chronic osteomyelitis of the ankle and chronic pain at the site of the total knee arthroplasty. †At 5.8 years (range, two to 14.2 years) after insert exchange. ‡At 4.6 years (range, two to 8.8 years) after insert exchange.

The Journal of Arthroplasty 33 (2018) 2946-2951

	Contents lists available at ScienceDirect	THE JOCENAL OF ARTHROPLASTY					
	The Journal of Arthroplasty						
ELSEVIER	journal homepage: www.arthroplastyjournal.org						
Revision Arthroplasty							
Isolated Polyethylene Exchange With Increased Constraint Is Comparable to Component Revision TKA for Instability in Properly Selected Patients							
H. John Cooper, MD [*] , Joaquin Moya-Angeler, MD, PhD, Marcel A. Bas-Aguilar, MD, Matthew S. Hepinstall, MD, Giles R. Scuderi, MD, Jose Rodriguez, MD							
Department of Orthopaed	lic Surgery, Lenox Hill Hospital, Northwell Health, 130 East 77th Street, New York, NY						

Table 6

Prior Studies Reporting Results of ITPIE.

	ITPIE							
	Instability	Others	CG	F/U	FR	KSK	KSF	↑ Constraint
Engh et al ¹⁷	0	63	Ν	88	17%	65	HSS ^a	0%
Brooks et al ⁹	14	0	Ν	56	29%	73	HSS ^b	0%
Babis et al ⁸	27	29	Ν	99	44%	76	59	0%
Willson et al ¹⁰	23	19	Ν	67	59%	85	65	NR
Konrads et al ¹⁸	NR	62	Ν	35	11%	120	/	NR
Present study	36	0	Y	39	19%	82	81	47%

- n=90 revision TKA, 3.7 years FU
- 40% isolated tibial PE exchange with increased constraint, 60% component revision
- Mean increase of 4.4mm
- Failure rates **19.4% versus 18.5%** (ns)
- Re-revision rates significantly lower (6.3% vs 30.8%) when insert constraint was increased

The Journal of Arthroplasty 35 (2020) 1328-1332



Revision Arthroplasty

Isolated Polyethylene Insert Exchange for Flexion Instability After Primary Total Knee Arthroplasty Demonstrated Excellent Results in Properly Selected Patients

Cody C. Green, MD, George J. Haidukewych, MD *

Division of Orthopaedic Trauma & Complex Adult Reconstruction, Department of Orthopaedic Surgery, Orlando Regional Medical Center, Orlando, Florida



31 knees with insert exchange for flexion instability after primary TKA

Check for updates

- FU = 41 months (24-85)
- 62% : Cruciate-retaining TKAs revised to deep-dish insert
- 38% : PS TKAs revised to thicker PS insert
- KSS improved from 70 to 86 (p<0.05), function scores from 39 to 44 (p<0.05)
- Failure rates 6.5%

> Bone Joint J. 2021 Jun;103-B(6):1103-1110. doi: 10.1302/0301-620X.103B6.BJJ-2020-1954.R2.

Isolated tibial insert exchange in revision total knee arthroplasty : reliable and durable for wear; less so for instability, insert fracture/dissociation, or stiffness

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Matthew W Tetreault <sup>1</sup>, Jeremy T Hines <sup>1</sup>, Daniel J Berry <sup>1</sup>, Mark W Pagnano <sup>1</sup>,
Robert T Trousdale <sup>1</sup>. Matthew P Abdel <sup>1</sup>
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Affiliations + expand PMID: 34058882 DOI: 10.1302/0301-620X.103B6.BJJ-2020-1954.R2 From 1985 to 2016, 270 isolated insert exchanges 55% Instability 39% Wear 5% Insert fracture 1% Stiffness

- Global survivorship @ 10 years : 68%
 - Insert wear : 74%
 - FT instability : 69% (reccurence of the original indication)
 - Insert fracture : 33%



Review article

Rate of complications and short-term Functional Results of Revision Total Knee Arthroplasty for Tibio-femoral Instability: do stability and range of motion are restored in 62 revisions

Antoine Labouyrie ^{a,b,*}, Julien Dartus ^b, Sophie Putman ^b, Teddy Trouillez ^b, Henri Migaud ^b, Gilles Pasquier ^b

^a Université de Médecine de Lille, CHU Lille, Hôpital Salengro, Hauts de France, 59000 Lille, France ^b Service d'Orthopédie 2, CHU Lille Hôpital Roger Salengro, Avenue Emile Laine, 59000 Lille, France

- 8 isolated insert exchange
- Moderate global FT instability

« ...must be carefully indicated, otherwise instability may not be corrected and/or functional consequences such as stiffness may occur

xford Knee Score evolution by type of instability and type of implants used for
evision Total Knee Arthroplasty.

	n = 59	Delta OKS Mean ± SD [Min- Max]	р	RTKA type	Delta OKS Mean ± SD [Min- Max]	р
1				Semi- constrained prosthesis (n = 20)	$14.4 \pm 10.2 = [-8-33]$	
	Extension (n = 25)	12.7 ± 11 [-8-33]		Rotating hinge prosthesis (n = 5) Isolated Polyethylene insert exchange (n = 0) Semi-	5.6 ± 11.4 [-7-22]	0.054 [°]
				constrained prosthesis $(n = 17)$	$\begin{array}{c} \textbf{16.2} \pm \textbf{9} \\ \textbf{[4-33]} \end{array}$	
	Flexion/ Midflexion (n = 19)	15,8 ± 8.9 [4–33]	0.77 ^ª	Rotating hinge prosthesis (n = 2) Isolated Polyethylene insert exchange (n = 0) Semi-	13 ± 9.9 [6–20]	N/A
				constrained prosthesis $(n = 5)$	12 ± 11.1 [0–31]	
	Global $(n = 15)$	$\begin{array}{c} 11.5\pm11\\ [-1{-}31] \end{array}$	0.13 ^b	Rotating hinge prosthesis $(n = 2)$	19.5 ± 6.9 [14–29]	N/A
t b m	е ау оссі	ur »		Isolated Polyethylene insert exchange (n = 8)	10.1 ± 10.1 [-1-29]	0.31 ^d

Take Home Message

- Low morbidity
- Still controversial, 55-80% success
 - Increase of thickness at least 4mm
 - Increase constraint if possible
 - Best indication : global or flexion instability (PCL deficiency)
 - A Gap imbalance may require a femoral revision or constrained implants

THE TOTAL KNEE ARTHROPLASTY 24 - 26 SEPTEMBER 202

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Journées Lyonnaises de Chirurgie du Genou

