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Keeping you active.

Journal Club: Knee Arthroplasty Cases

Chancellor F. Gray, MD

September 20, 2024

Case 1- Patient DM

- 69yoF
- Longstanding R knee pain
- Attempted injections, NSAIDs, activity modification

- Wants to discuss surgery

- Has failed weight loss efforts over 2 years

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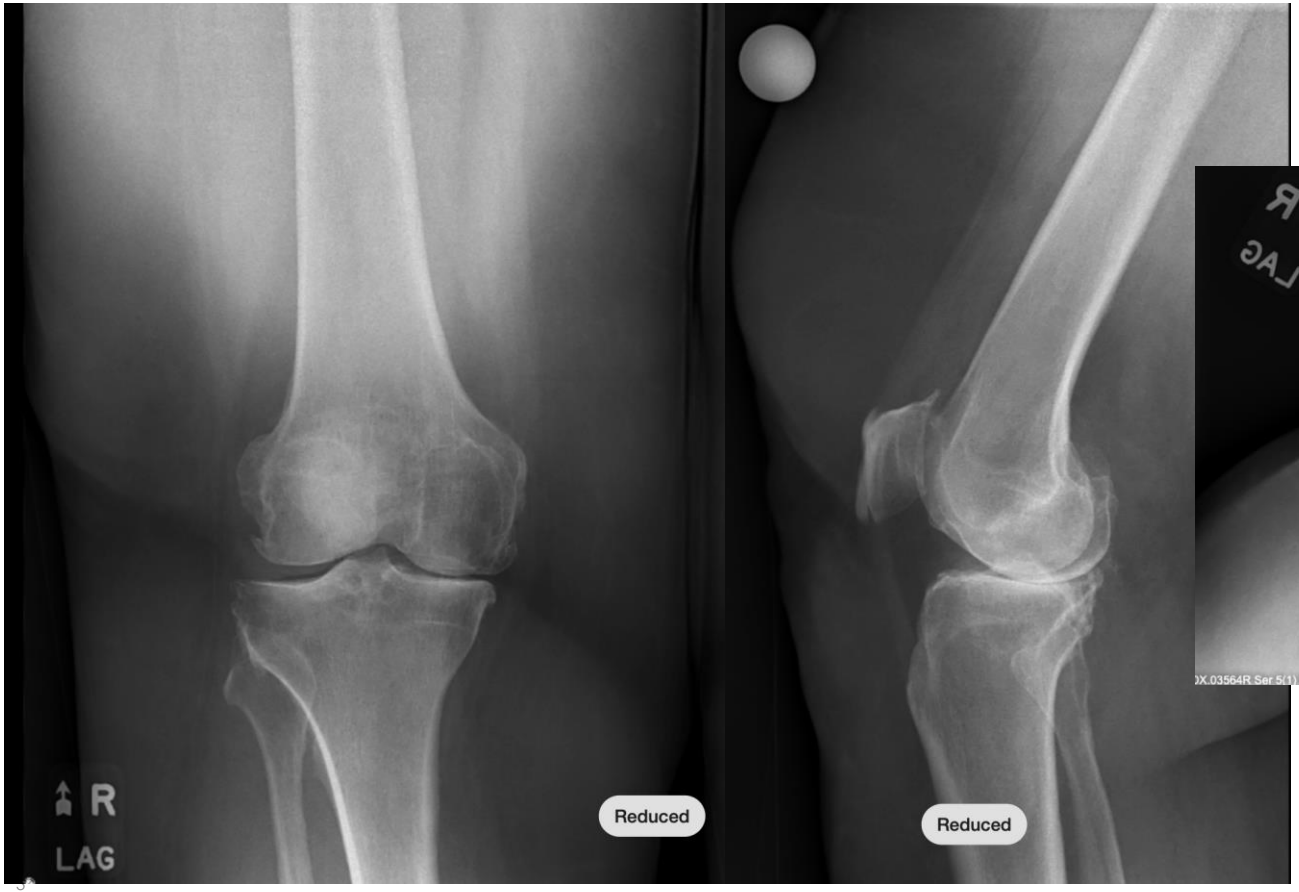
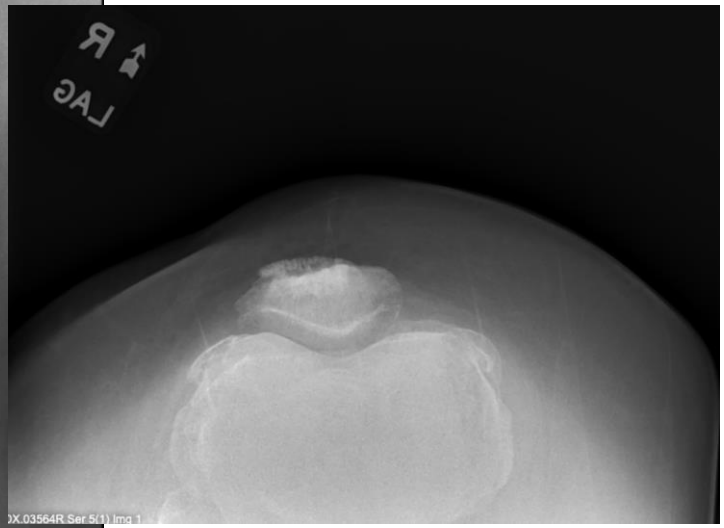
Case 1- Patient DM



BMI: 49.9



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Case 1- Patient DM- Questions

1. How do you manage “the weight conversation?”
2. What programs do you use to help with weight loss?
3. When do you discuss surgery?
4. Any special other measures you take at surgery?

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Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Knee

Is Morbid Obesity a Modifiable Risk Factor in Patients Who Have Severe Knee Osteoarthritis and do Not Have a Formal Perioperative Optimization Program?

Check for updates

Mina Botros, MD [a], Paul Guirguis, MD [a], Rishi Balkissoon, MD, MPH [a], Thomas G. Myers, MD [a], Caroline P. Thirukumaran, MBBS, MHA, PhD [a, b], Benjamin F. Ricciardi, MD [a, b, *]

[a] *Department of Orthopaedics and Rehabilitation, University of Rochester Medical Center, Rochester, New York*
[b] *Center for Musculoskeletal Research, University of Rochester Medical Center, Rochester, New York*

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University of Rochester
~625 patients presented for TKA eval with BMI >40, and K-L Grade 3-4 OA

Questions:

1) What weight loss strategies were used?
2) Who effectively lost weight?
3) Who ultimately went on to surgery?

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Table 1
Demographics and Interventions Performed for Morbidly Obese Patients Who Have Severe Knee Osteoarthritis.

Parameter	Weight Loss Treatment			Total (N = 624)	*P* Value
	No Treatment (N = 306)	Nonsurgical Treatment (N = 244)	Surgical Treatment (N = 74)		
Age (mean [range])	58 (31 to 79)	57 (31 to 84)	53 (27 to 69)	57 (27 to 84)	<.001[a]
Sex (N, %)					.472
Women	224 (75)	185 (76)	65 (81)	474 (76)	
Men	76 (25)	59 (24)	15 (19)	150 (24)	
Race (N, %)					.044[a]
White	209 (70)	193 (79)	58 (73)	460 (74)	
Non-White	91 (30)	51 (21)	22 (28)	164 (26)	
Ethnicity (N, %)					.643
Non-Hispanic	294 (98)	236 (97)	78 (98)	608 (97)	
Hispanic	6 (2)	3 (2)	2 (3)	16 (3)	
KL Grade (N, %)					.981
3	151 (50)	122 (50)	41 (51)	314 (50)	
4	149 (50)	122 (50)	39 (49)	310 (50)	
Charlson Comorbidity Index (CCI) (mean, SD)	2 (1.5)	3 (1.2)	2 (1.2)	2 (1.4)	.005[a]
Diabetes Mellitus (N, %)					.007[a]
Yes	105 (35)	111 (46)	23 (29)	239 (38)	
No	199 (65)	133 (54)	57 (71)	389 (62)	
Hemoglobin A1C (mean, SD)	6.6 (1.5)	6.4 (1.4)	5.9 (1.1)	6.4 (1.4)	<.001[a]
Current Smoking (N, %)					.213
Yes	30 (10)	22 (91)	3 (4)	55 (9)	
No	270 (90)	222(91)	77 (96)	569 (91)	
Opioid Use (N, %)					.493
Yes	58 (19)	38 (16)	13 (16)	109 (17)	
No	242 (81)	206 (84)	67 (84)	515 (83)	
Second Opinion (N, %)					.282
Yes	37 (12)	30 (12)	15 (19)	82 (13)	
Insurance (N, %)					.229
Commercial	131 (44)	120 (49)	43 (54)	294 (47)	
Medicaid	16 (16)	31 (13)	10 (13)	88 (14)	
Medicare	107 (36)	76 (31)	16 (20)	199 (32)	
Other	15 (5)	17 (7)	11 (14)	43 (7)	
Length of Follow-up, mo (mean, range)	35 (12 to 145)	54 (12 to 139)	56 (12 to 135)	45 (12 to 145)	
Area Deprivation Index (ADI) (mean, SD)	73 (17)	70 (19)	71 (17)	72 (18)	.323

SD, standard deviation.
[a] $P < .05$.

Table 2
Association of Weight Loss Interventions With Joint Arthroplasty Surgery and Changes in Body Weight.

Parameter	Weight Loss Treatment			Total (N = 624)	*P* Value
	No Treatment (N = 300)	Nonsurgical Treatment (N = 244)	Surgical Treatment (N = 80)		
Joint Arthroplasty Surgery (N, %)					.004[a]
No Surgery	281 (94)	207 (85)	67 (84)	555 (89)	
Surgery	19 (6)	37 (15)	13 (16)	69 (11)	
Maximum Change in BMI (mean, range)	0.4 (0 to 15)	−2.6 (0 to 12)	−3.3 (0 to 22)	−1 (6)	<.001[a]
Maximum Change in BMI (N, %)					
More than or Equal to 10	3 (1)	21 (8)	19 (24)	43 (7)	
Less than 10	239 (80)	208 (85)	54 (68)	501 (80)	
Missing	58 (19)	15 (6)	7 (9)	80 (13)	
Maximum Change in BMI (N, %)					<.001[a]
More than or Equal to 5	18 (6)	66 (27)	31 (39)	115 (18)	
Less than 5	224 (75)	163 (67)	42 (53)	429 (69)	
Missing	58 (19)	15 (6)	7 (8)	80 (13)	

SD, standard deviation.
[a] $P < .05$.

Conclusions

1. Low likelihood of making a significant BMI change without intervention
2. Even then, odds are low of getting less than 40 kg/m2
3. Surgical yield overall low (~11%)

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Case 2- Patient WC

- 73yoM bilateral, R>L knee pain for several years
- Attempted injections, activity modifications
- PMH: “healthy” except TIA 2 years ago (“amaurosis fugax”)
- Per wife, “He is avoiding picking up the grandkids now…”
- Remains very active- works in yard, on house (15 acre property)

Case 2- Patient WC

Case 2- Patient WC- Questions

1. Do you consider bilateral?
2. What about outpatient?
3. What fixation do you favor for high activity males?
4. Any concerns with cementless fixation in older patients?

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Proceedings of the Knee Society 2023

Cementless Total Knee Arthroplasty: Does Age Affect Survivorship and Outcomes?

Adit R. Maniar, MBBS, MS, DNB *, James L. Howard, MD, MSc, Lyndsay E. Somerville, PhD, Brent A. Lanting, MD, MSc, Edward M. Vasarhelyi, MD, MSc

Division of Orthopaedic Surgery, Department of Surgery, Schulich School of Medicine and Dentistry, Western University and London Health Sciences Centre, London, Ontario, Canada

Western University and London Health Science Centre, Ontario
~350 patients with cementless fixation, divided to three age groups: <60yo, 60-70yo, >70yo

Questions:

1) Are there differences by age in PROMs?
2) Are there differences in age by short-term outcome (aseptic loosening)?

Table 1
General Demographics.

Demographics	Group A	Group B	Group C	*P* Value
Sex				
% Women	55.1	36.3	24.6	<.001
BMI	36.35	33.39	30.54	<.001
Laterality				.456
% Right	52.5	46.4	54.1	
ASA grade	%	%	%	.521
1	2.5	1.2	1.6	
2	45.8	42.3	31.3	
3	49.2	53.0	63.9	
4	2.5	3.6	3.3	

ASA, American Society of Anesthesiologists; BMI, bod mass index.

Table 3
Implant Characteristics Comparison.

Implant Characteristics	Group A	Group B	Group C	*P* Value
Implant model				.316
% Implant 1	86.4	91.7	86.9	
% Implant 2	13.6	8.3	13.1	
PS versus CS versus CR				.161
% CS	86.4	91.7	85.2	
% CR	14.4	7.7	13.1	
% PS	0	0.6	1.6	
Patella resurfacing	0.8	1.2	0	

Implant 1 — Triathlon System (Stryker, USA).
Implant 2 — Attune System (DePuy, USA).
PS, posterior stabilized; CS, cruciate substituting; CR, cruciate retaining.

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Table 6
Clinical Scores at Final Follow-up.

Outcomes	Group A Mean ± SD	Group B Mean ± SD	Group C Mean ± SD	*P* Value
Range of motion	115.71 ± 11.56	117.66 ± 7.53	116.71 ± 10.09	.388
KSCRS total	183.24 ± 21.16	182.40 ± 21.68	183.32 ± 20.90	.955
KSCRS function	91.13 ± 13.67	88.38 ± 17.09	89.10 ± 18.13	.521
KSCRS knee	92.11 ± 10.53	94.02 ± 8.76	93.97 ± 10.06	.378
WOMAC total	76.03 ± 18.50	78.85 ± 18.45	76.32 ± 20.74	.552
WOMAC stiffness	70.17 ± 22.78	72.20 ± 21.05	71.71 ± 24.09	.818
WOMAC function	75.59 ± 20.90	79.21 ± 18.84	76.55 ± 21.32	.449
WOMAC pain	79.58 ± 18.99	81.85 ± 19.09	78.42 ± 21.53	.567
VR-12 physical	43.20 ± 9.52	43.36 ± 10.79	41.94 ± 11.15	.772
VR-12 mental	51.11 ± 11.20	55.98 ± 8.86	55.37 ± 9.61	.003

KSCRS, Knee Society Clinical Rating Scale; WOMAC, Western Ontario and McMaster University Osteoarthritis Index; VR-12, Veterans Rand 12 Item Health Survey; SD, standard deviation.

No cases of aseptic loosening!

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Conclusions

1. Cementless fixation likely durable even for older males
2. We don’t know about older females (from this study)
3. At early-mid follow-up, no changes in PROMs

AJRR Data 2023

Figure 3.11 Cumulative Percent Revision for Cemented Versus Cementless Fixation Primary Total Knee Arthroplasty in Male Medicare Patients 65 Years of Age and older with Primary Osteoarthritis, 2012-2022

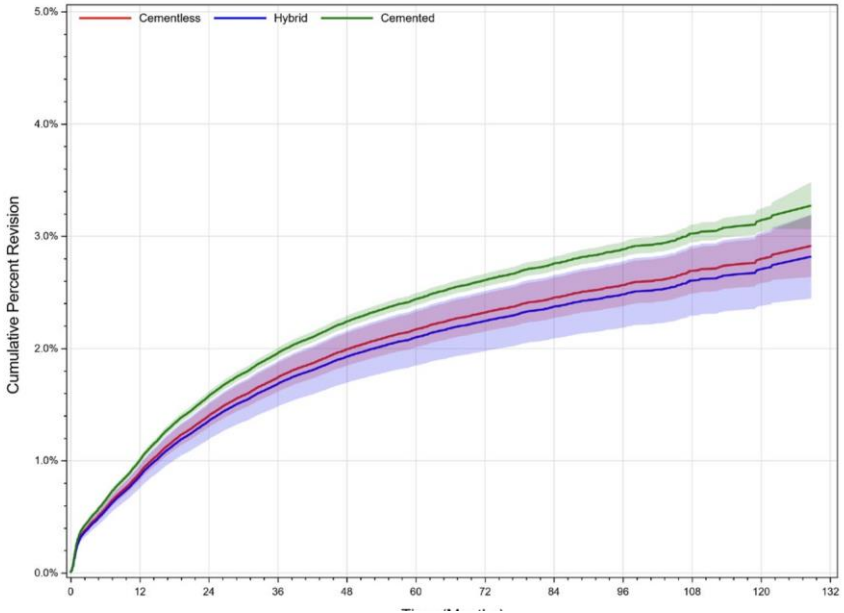
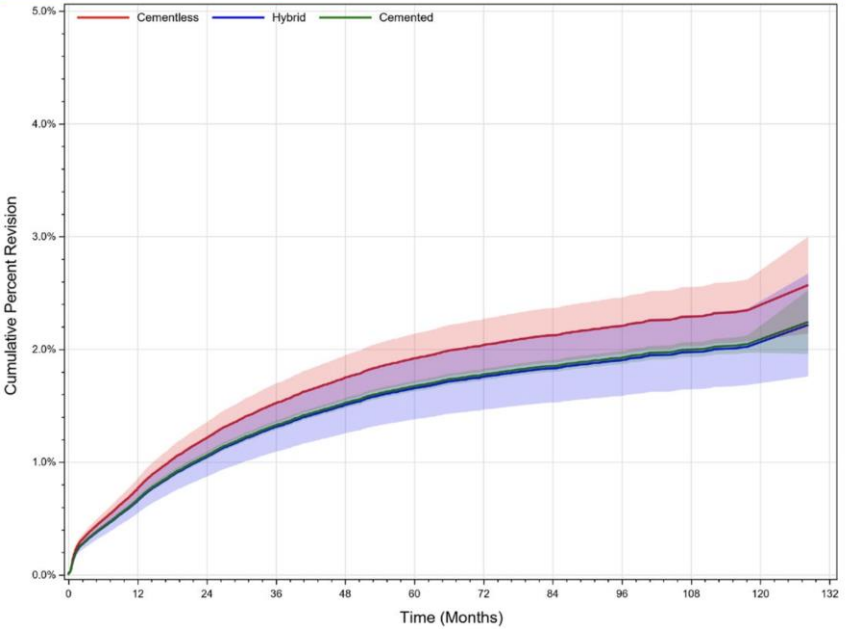


Figure 3.12 Cumulative Percent Revision for Cemented Versus Cementless Fixation Primary Total Knee Arthroplasty in Female Medicare Patients 65 Years of Age and older with Primary Osteoarthritis, 2012-2022



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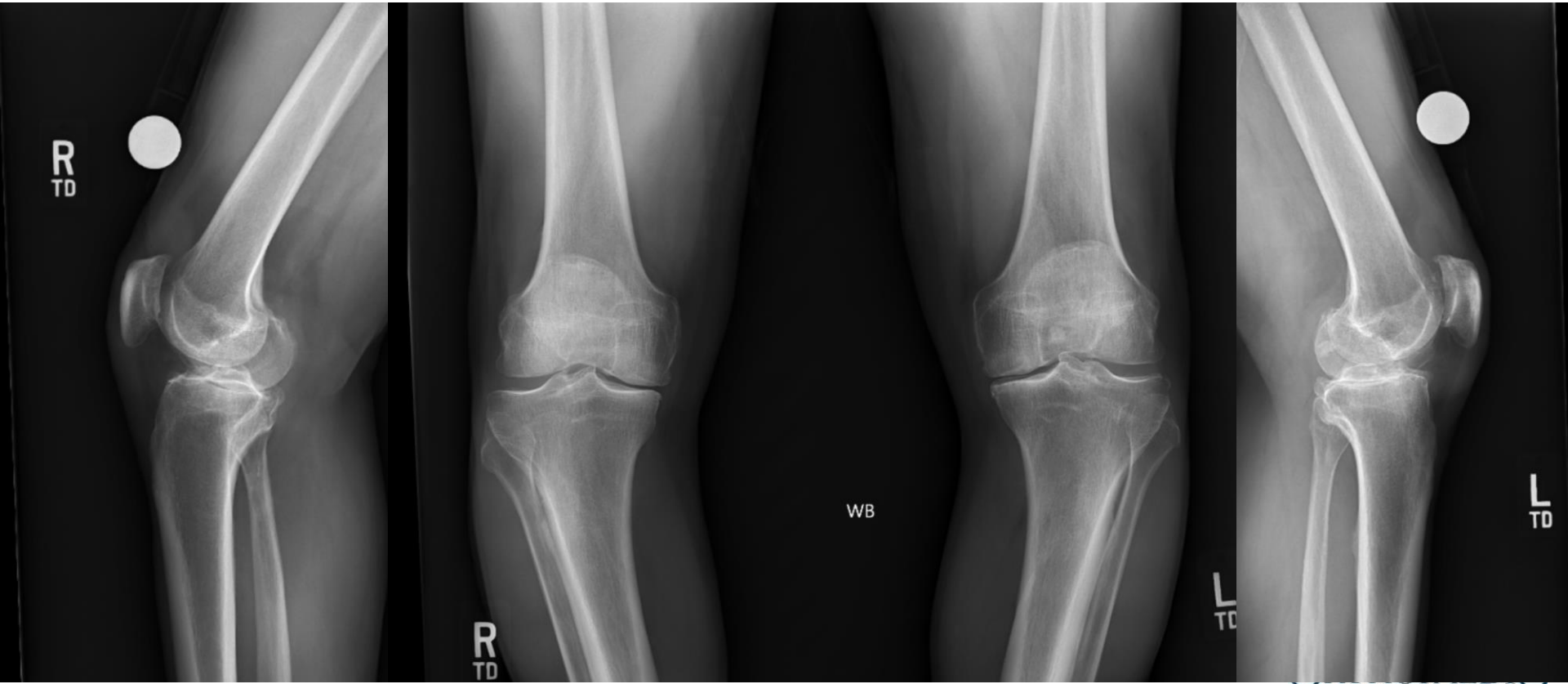
Case 3- Patient JF

- 81yoM bilateral, R>L knee pain for several years

- Attempted injections, activity modifications
- 3rd orthopaedic consult
- 1hr office visit at first eval

- Remains very active- works in yard, on house (15 acre property)

Case 3- Patient JF



Case 3- Patient JF- Questions

1. How do you handle the hyper-attentive, over-researched, google expert?
2. What if they ask about robotics (or implants, or approach, etc)?
3. If you do robotics, do you charge a differential?
4. Should all payers be expected to pay the robotic CPT code(s) [20985 for TKA]?

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The Cost-Effectiveness of Computer-Assisted Compared with Conventional Total Knee Arthroplasty

A Payer's Perspective

Yao Tian, PhD, MS, MPH, Abdalrahman G. Ahmed, BS, Annika N. Hiredesai, BA, Lynn Wei Huang, MS, Ankita M. Patel, BSPT, and Hassan M.K. Ghomrawi, PhD, MPH

Feinberg School of Medicine, Northwestern (and the Center for Health Services and Outcomes Research)

A Markov Analysis (Decision Tree)—Type of economic and game theory analysis using assumptions of event probabilities and gain (or loss) of function (expressed as QALYs)

Question:

1) Is it worth it for public (and/or private payers) to pay extra for computer technology in surgery?

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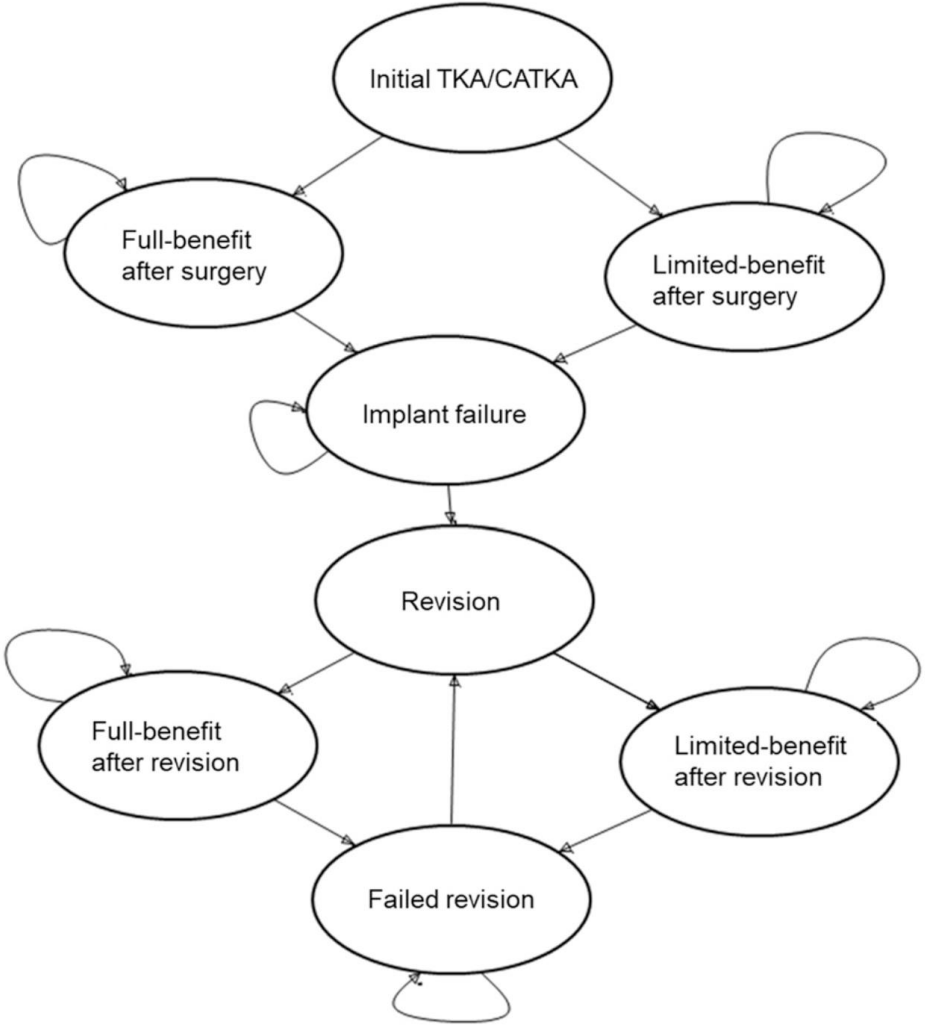
Initial TKA/CATKA
Full-benefit after surgery
Limited-benefit after surgery
Implant failure
Revision
Full-benefit after revision
Limited-benefit after revision
Failed revision

TABLE I Key Model Parameters Collected from Published Literature*

	Computer-Assisted TKA	Conventional TKA
Costs†		
Initial surgery (bundled payment program)		
Joint replacement without complications (MS-DRG: 470)	$26,333[43]	$26,333[43]
Joint replacement with complications (MS-DRG: 469)	$41,244[43]	$41,244[43]
Initial surgery (FFS program)		
Joint replacement without complications (MS-DRG: 470)	$33,258[43]	$33,258[43]
Joint replacement with complications (MS-DRG: 469)	$47,851[43]	$47,851[43]
Revision	$59,528[28]	$59,528[28]
Implant failure	$8,827.5[27,28]	$8,827.5[27,28]
Effectiveness *(QALYs)*		
Full benefit	0.823 when entering the state, decreasing over years[27,28]	0.823 when entering the state, decreasing over years[27,28]
Limited benefit	0.749 when entering the state, decreasing over years[27,28]	0.749 when entering the state, decreasing over years[27,28]
Failure	0.590 when entering the state, decreasing over years[27,28]	0.590 when entering the state, decreasing over years[27,28]
Death	0	0
1 year after initial surgery‡	0.828	0.828
Transition probabilities§		
Postoperative complication rate	0.004[15]	0.028[15]
15-year failure rate‡	0.055[13]	0.059[13]

*MS-DRG = Medicare Severity Diagnosis Related Group. †In 2022 U.S. dollars. ‡Threshold analysis was used to quantify potential differences with

There were limitations to this study. First, the 15-year failure rate data were derived from the AOANJRR[13], as no other longitudinal data are publicly available to compare the long-term failure rate between conventional TKA and computer-assisted TKA. The U.S. failure rates may be different from those in Australia; however, U.S. data are not yet available. Second, the postoperative complication rate data were obtained from 1 prior study[15], which compared the rate between conventional TKA and computer-assisted TKA using the most comprehensive list of complications published by the CMS and recent population-based data of which we are aware. Although the study used data from 2 large states, this evidence is still not representative of the entire United States. Lastly, we did not assess the cost-effectiveness of computer-assisted TKA on the basis of patients' comorbidity status, as this information (e.g., computer-assisted TKA-specific mortality rates stratified by comorbidity status) was not available.

TABLE II Costs and Cumulative Effectiveness of Computer-Assisted TKA Compared with Conventional TKA

Analysis	Cost*	Cumulative Effectiveness† *(QALYs)*	Incremental Cost*	Incremental Effectiveness† *(QALYs)*	Incremental Cost-Effectiveness Ratio *($/QALY)*
Elderly patients reimbursed through a bundled payment program in the lifetime term					
Computer-assisted TKA	$30,609	14.425	—	—	Dominant
Conventional TKA	$31,239	14.424	$630	−0.001	Dominated
Elderly patients reimbursed through an FFS program in the lifetime term					
Computer-assisted TKA	$37,532	14.425	—	—	Dominant
Conventional TKA	$38,155	14.424	$623	−0.001	Dominated
Patients who were not elderly reimbursed through a bundled payment program in the short term (3, 5, and 10 years)					
Computer-assisted TKA	$26,841, $26,997, $27,353	2.459, 4.068, 7.854	—	—	Dominant
Conventional TKA	$27,235, $27,409, $27,799	2.459, 4.068, 7.854	$394, $412, $446	—†	Dominated
Patients who were not elderly reimbursed through an FFS program in the short term (3, 5, and 10 years)					
Computer-assisted TKA	$33,765, $33,920, $34,277	2.459, 4.068, 7.854	—	—	Dominant
Conventional TKA	$34,151, $34,325, $34,716	2.459, 4.068, 7.854	$386, $405, $439	—†	Dominated

*Costs are shown in 2022 U.S. dollars. †As cumulative QALYs are rounded to 3 decimal places, very small differences between computer-assisted TKA and conventional TKA are not visible for patients who were not elderly and were reimbursed in the short term through either a bundled payment or an FFS program.

Conclusions

1. Computer assisted TKA *may* actually be cheaper from a payer perspective
2. Better US data to assess relative long-term results is needed

Post-op Films

Case 4- Patient LH

- 70yoM h/o bilateral staged TKA
  - L 2004 – he loves it (Duke, NC)
  - R 2013 – constant pain (Ocala, FL)

- Got a letter in Summer 2022 about a “recall;” lost trust in his operating surgeon

- Remains very active- golfs every day and plays pickleball and tennis, but with pain

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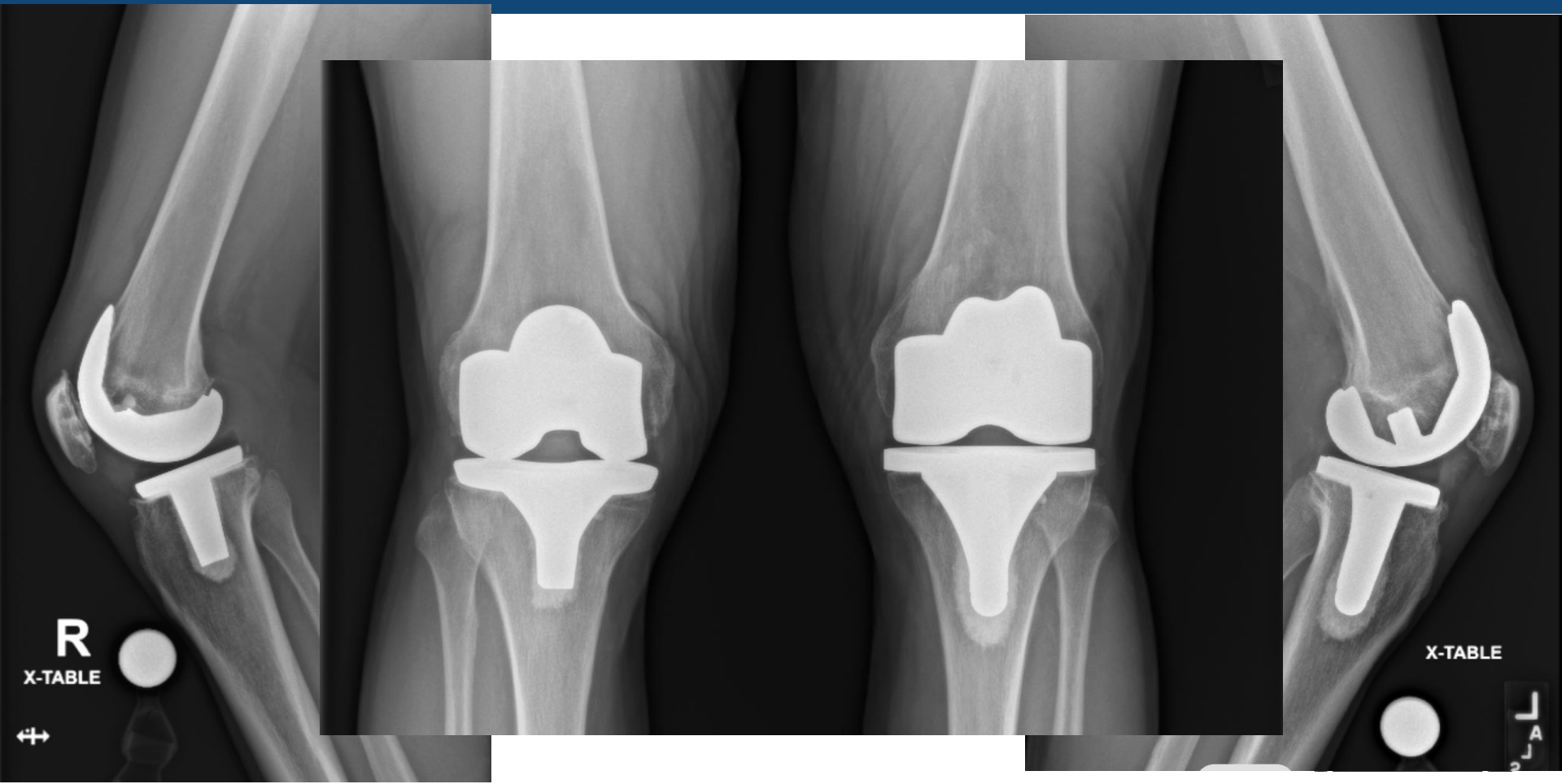
Case 4- Patient LH



Case 4- Patient LH- Questions

1. Any further imaging/ studies?
2. What's the role of observation?
3. How do you counsel him on your surgical plan?/ What's your threshold to start fresh?
4. What do you do with the patella?

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Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Knee

Femoral Component Debonding Frequently Missed on Advanced Imaging Prior to Revision of a Recalled Total Knee Arthroplasty

Tracy M. Borsinger, MD [a, b], Sonia K. Chandi, MD [a, *], Elshaday S. Belay, MD [a], Yu-Fen Chiu, MS [a], Elizabeth B. Gausden, MD [a], Thomas P. Sculco, MD [a], Geoffrey H. Westrich, MD [a]

[a] *Adult Reconstruction and Joint Replacement, Hospital for Special Surgery, New York, New York*
[b] *Department of Orthoapedic Surgery, University of Virginia, Charlottesville, Virginia*

Hospital for Special Surgery (Probably second to Ocala, FL among the Exactech capitals of the US)

77 patients revised with Exactech Optetrak who had advanced imaging to assess implant fixation (in addition to poly problem, high rate of femoral debonding)

Questions:

1) How are CT and MRI at identifying debonding in confirmed loose implants?
2) Are there identifiable risk factors for this problem?

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- 46 of 77 femora (60%) were debonded when tested intraoperatively
- No cohort specific risk factors identified

Table 3
Sensitivity and Specificity for Identification of Femoral Component Debonding With Radiographs, CT, and MRI.

Imaging Modality	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)	Negative Predictive Value (%)	LR+	LR−	Diagnostic OR	Accuracy	AUC
Radiograph	24	100	100	47	–	0.8	–	55%	0.620
CT	28	97	93	48	8.8	0.7	11.8	56%	0.625
MRI	3	94	89	50	5.7	0.7	8.5	60%	0.653

CT, computed tomography; MRI,magnetic resonance imaging; LR, likelihood ratio; OR, odds ratio; AUC, area under the curve.

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Conclusions

1. Take seriously any patient with this implant and pain, even with negative radiographs, advanced imaging
2. Plan to vigorously test all femoral components intraoperatively when revising
3. My preference is full revision regardless

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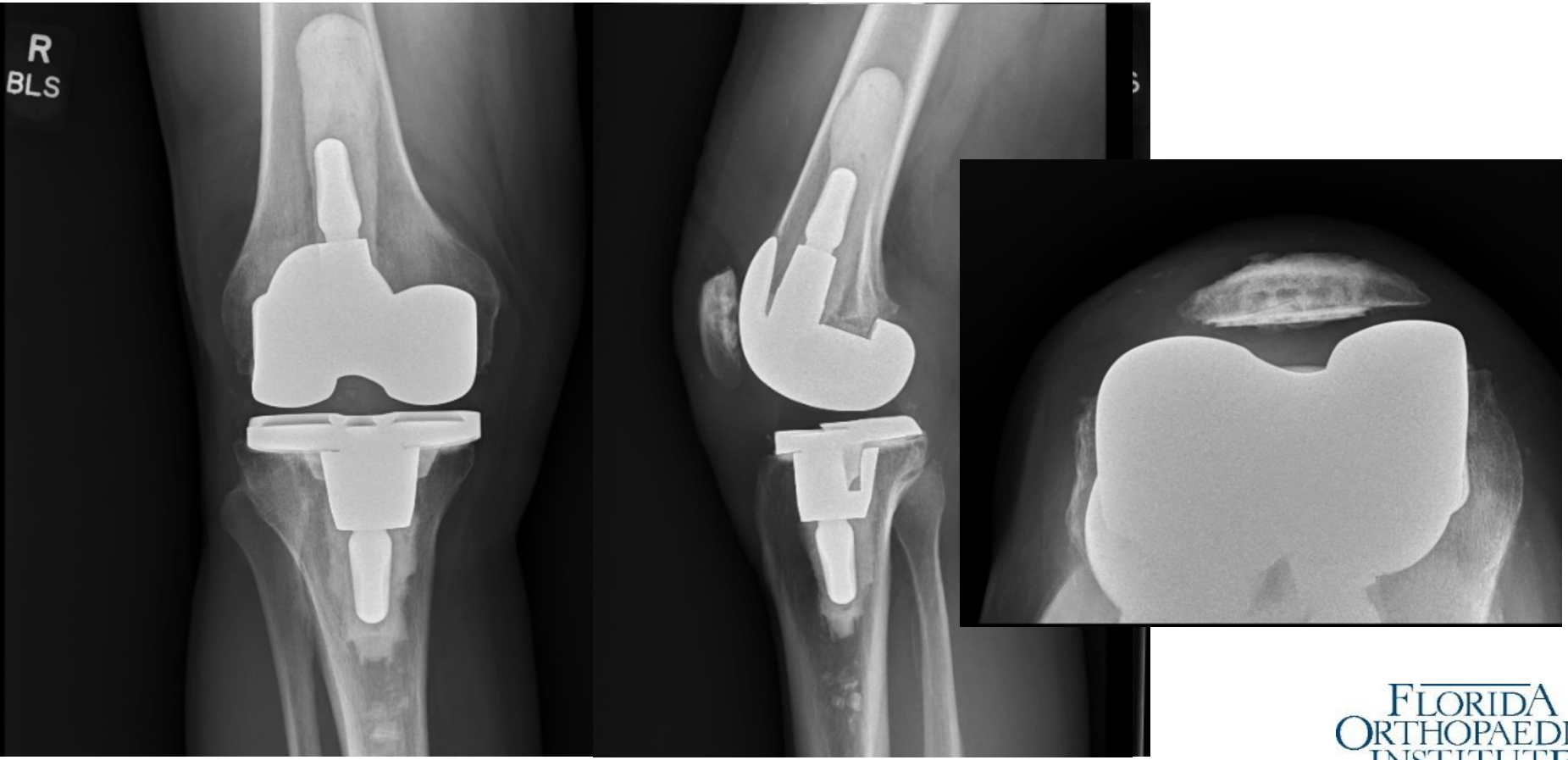
Post-op Films



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Case 5- Patient DD

- 61yoM bilateral knee pain
- PMH: high blood pressure, former smoker (>10 years ago)

- Very active in softball league, snowbird between Chicago and Florida

- Now skipping softball regularly

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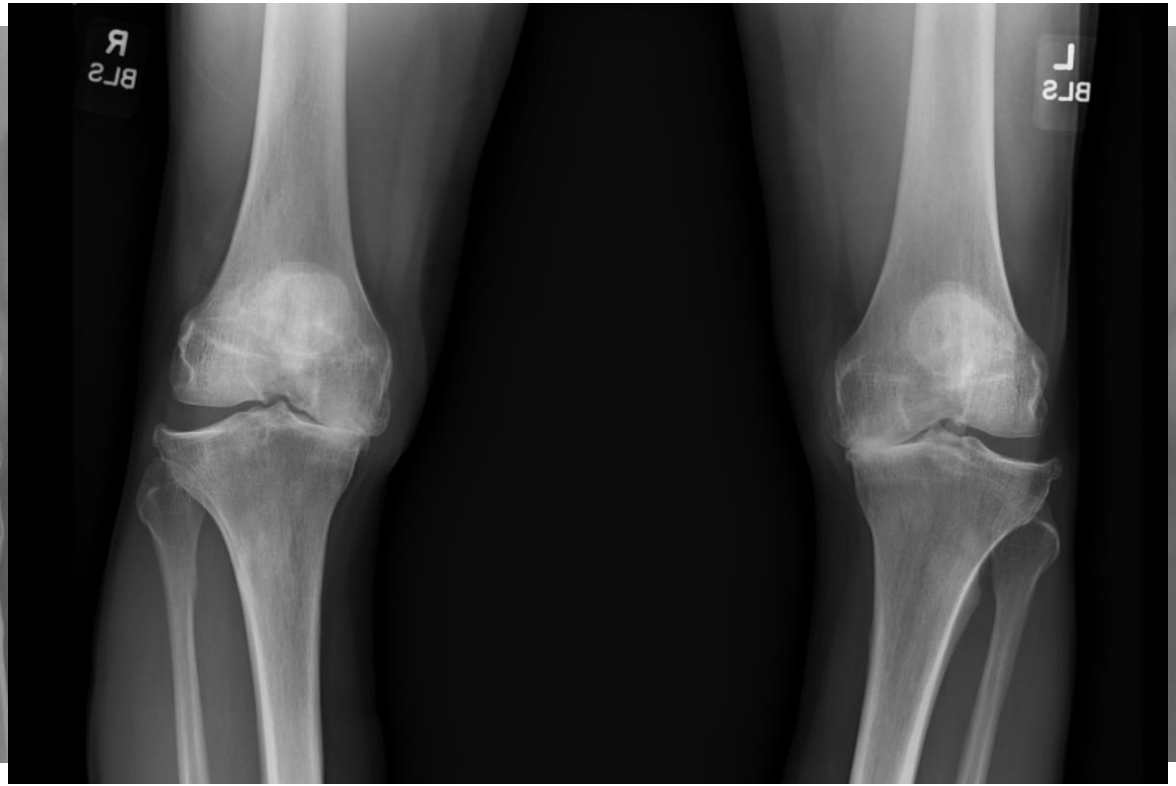
Case 5- Patient DD



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Case 5- Patient DD- Questions

1. How do you manage the insistent bilateral request?
2. Any special clearances or counseling?
3. Changes in surgical technique or post-operative protocol?

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Complications and Safety of Simultaneous Bilateral Total Knee Arthroplasty

A Patient Characteristic and Comorbidity-Matched Analysis

Mary K. Richardson, BS, Kevin C. Liu, BS, Cory K. Mayfield, MD, Natalie M. Kistler, BS, Alexander B. Christ, MD, and Nathanael D. Heckmann, MD

Investigation performed at the Keck School of Medicine of USC, Los Angeles, California

Keck School of Medicine, USC

Database review of Premier Healthcare Database—21000 bilateral simultaneous patients with 6:1 match of non-bilateral to power analysis of rare complications

Question:

1) Is there an increased complication profile for simultaneous bilateral TKA when controlling for non-modifiable risk factors?

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TABLE II Patient Comorbidities Upon Admission Demonstrating the Matching of Certain Comorbidities

Comorbidity	Simultaneous Bilateral TKA Group* (N = 21,044)	Unilateral TKA Group* (N = 126,264)	P Value†
Acute kidney injury or chronic kidney disease	547 (2.60%)	3,282 (2.60%)	1
Blood loss anemia	3 (0.01%)	18 (0.01%)	1
Congestive heart failure	40 (0.19%)	240 (0.19%)	1
Chronic obstructive pulmonary disease	2,025 (9.62%)	12,150 (9.62%)	1
Diabetes mellitus			
Without complications	2,246 (10.67%)	13,476 (10.67%)	1
With complications	431 (2.05%)	2,586 (2.05%)	1
Hypertension	12,403 (58.94%)	74,418 (58.94%)	1
Obesity	6,315 (30.01%)	37,890 (30.01%)	1
Peripheral vascular disease	62 (0.29%)	372 (0.29%)	1
Pulmonary circulation disorder	2 (0.01%)	12 (0.01%)	1
History of venous thromboembolism	288 (1.37%)	1,728 (1.37%)	1
History of stroke	167 (0.79%)	1,002 (0.79%)	1
Alcohol abuse	225 (1.07%)	1,193 (0.94%)	0.087
Chronic peptic ulcer disease	85 (0.40%)	303 (0.24%)	**<0.001**
Coagulopathy	329 (1.56%)	2,077 (1.64%)	0.387
Iron-deficiency anemia	243 (1.15%)	1,282 (1.02%)	0.064
Depression	2,587 (12.29%)	17,011 (13.47%)	**<0.001**
Drug abuse	167 (0.79%)	1,061 (0.84%)	0.49
Fluid imbalance	1,805 (8.58%)	6,167 (4.88%)	**<0.001**
HIV or AIDS†	7 (0.03%)	36 (0.03%)	0.709
Hypothyroidism	3,171 (15.07%)	19,147 (15.16%)	0.72
Liver disease	196 (0.93%)	1,513 (1.20%)	**0.001**
Lymphoma	25 (0.12%)	182 (0.14%)	0.364
Metastatic cancer	6 (0.03%)	25 (0.02%)	0.42
Paralysis	14 (0.07%)	81 (0.06%)	0.9
Psychosis	21 (0.10%)	247 (0.20%)	**0.003**
Rheumatoid arthritis	609 (2.89%)	4,221 (3.34%)	**0.001**
Valve disease	83 (0.39%)	590 (0.47%)	0.147
Abnormal weight loss	36 (0.17%)	131 (0.10%)	**0.007**
History of myocardial infarction	4 (0.02%)	40 (0.03%)	0.325
Circulatory disorder	45 (0.21%)	290 (0.23%)	0.655
Tumor	96 (0.46%)	487 (0.39%)	0.132

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TABLE IV Complication Rates Between Simultaneous Bilateral and Unilateral TKA Groups

Complication	Simultaneous Bilateral TKA Group* (N = 21,044)	Unilateral TKA Group* (N = 126,264)	Univariable Regression		Multivariable Regression	
			OR†	P Value‡	Adjusted OR§	P Value‡
PJI	91 (0.43%)	598 (0.47%)	0.91 (0.73 to 1.14)	0.418	0.89 (0.72 to 1.12)	0.321
Sepsis	49 (0.23%)	256 (0.20%)	1.15 (0.85 to 1.56)	0.374	1.09 (0.80 to 1.48)	0.599
Pulmonary embolism	57 (0.27%)	159 (0.13%)	2.15 (1.59 to 2.92)	**<0.001**	2.13 (1.57 to 2.89)	**<0.001**
Deep vein thrombosis	104 (0.49%)	680 (0.54%)	0.92 (0.75 to 1.13)	0.413	0.9 (0.73 to 1.10)	0.305
Wound dehiscence	80 (0.38%)	442 (0.35%)	1.09 (0.86 to 1.38)	0.496	1.08 (0.85 to 1.37)	0.541
Seroma	6 (0.03%)	15 (0.01%)	2.4 (0.93 to 6.19)	0.07	2.33 (0.90 to 6.03)	0.082
Stroke	28 (0.13%)	73 (0.06%)	2.3 (1.49 to 3.56)	**<0.001**	2.21 (1.42 to 3.42)	**<0.001**
Pneumonia	62 (0.29%)	311 (0.25%)	1.2 (0.91 to 1.57)	0.197	1.12 (0.85 to 1.48)	0.412
Respiratory failure	96 (0.46%)	426 (0.34%)	1.35 (1.08 to 1.69)	**0.007**	1.21 (0.96 to 1.51)	0.100
Myocardial infarction	22 (0.10%)	113 (0.09%)	1.17 (0.74 to 1.85)	0.505	1.12 (0.71 to 1.77)	0.637
Urinary tract infection	203 (0.96%)	1,249 (0.99%)	0.97 (0.84 to 1.13)	0.739	0.93 (0.80 to 1.08)	0.325
Hematoma	26 (0.12%)	190 (0.15%)	0.82 (0.54 to 1.24)	0.345	0.83 (0.55 to 1.25)	0.366
Hemarthrosis	9 (0.04%)	61 (0.05%)	0.89 (0.44 to 1.78)	0.733	0.86 (0.42 to 1.73)	0.664
Acute blood loss anemia	5,658 (26.89%)	18,765 (14.86%)	2.11 (2.04 to 2.18)	**<0.001**	2.06 (1.99 to 2.13)	**<0.001**
Hemorrhage	24 (0.11%)	227 (0.18%)	0.63(0.42 to 0.97)	**0.034**	0.61 (0.40 to 0.94)	**<0.001**
Transfusion	1,100 (5.23%)	850 (0.67%)	8.14 (7.43 to 8.91)	**<0.001**	7.84 (7.16 to 8.59)	**<0.001**
90-day readmission	589 (2.80%)	2,591 (2.05%)	1.37 (1.26 to 1.50)	**<0.001**	1.35 (1.24 to 1.48)	**<0.001**
90-day in-hospital death	10 (0.05%)	48 (0.04%)	1.25 (0.63 to 2.47)	0.521	1.15 (0.57 to 2.27)	0.698

*The values are given as the number of patients, with the percentage in parentheses. †The values are given as the OR, with the 95% CI in parentheses. ‡Significant values are shown in bold. §The values are given as the adjusted OR, with the 95% CI in parentheses.

Conclusions

1. Despite (probably) being selectively offered, simultaneous bilateral surgery has increased perioperative risks
2. Still a low readmission rate (2.8% at 30 days)
3. Any cardiopulmonary history should give you pause
4. Extensively counsel these patients

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Keeping you active.

Thank you!