

Patellofemoral Arthroplasty in Younger Patients: Are Recreational Activities Feasible?

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BACKGROUND

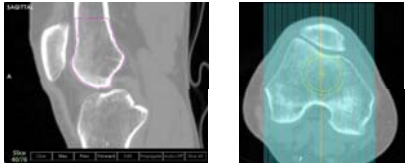
Treatment of isolated severe patellofemoral osteoarthritis in younger active patients is challenging

Patellofemoral arthroplasty (PFA) is a viable option for symptomatic patients in whom severe joint damage and loss of joint space is isolated to the patellofemoral compartment

PFA indications

- Painful patellofemoral arthritis
- Trochlear dysplasia
- Chronic joint dislocation or subluxation
- Trauma

Few studies have determined if patients who undergo PFA can return to recreational sports and work activities without subsequent problems.



STUDY PURPOSE

Prospective investigation on early results of 33 consecutive third-generation PFA procedures. Determine sports and work activity levels in younger active patients.

METHODS

33 Consecutive PFAs in 29 patients (4 bilateral)
Mean age 40 (range, 22-68); 26 patients < 50 yrs

96 Prior Operative Procedures (27 knees)

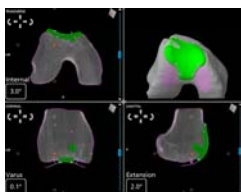
- 16 PF realignment (10 knees)
- 9 articular cartilage restorative procedures (7 knees)

Indications

- DJD: 18 knees
- Osteoarthritis secondary to malalignment: 11 knees
- Osteoarthritis secondary to trauma: 4 knees

PFA Procedure

- Cemented implant (RESTORIS MCK PF Implant System, Stryker)
- 3-D modeling, computer-assisted robotic surgical navigation (RIO, MAKOplasty Partial Knee Resurfacing, Stryker).



Preoperative planning

Allows precise reshaping of abnormal trochlea geometry with minimal bone resection

METHODS (Continued)

Concurrent Procedures

5 PF realignment 11 Z-plasty lateral release

Comorbidities 13 patients

6 Obesity, 2 tobacco, 2 diabetes, 1 obesity & tobacco, 1 Ehlers-Danlos syndrome, 1 tobacco & deficiency anemia

Comprehensive clinical evaluation, Cincinnati Knee Rating System, IKDC objective rating

Radiographs (standing AP, lateral, weight-bearing PA, PF axial)
- Trochlear dysplasia (Dejour) - Patellar height (Linclau)
- Kellegreen-Lawrence and IKDC (medial & lateral tibiofemoral)

RESULTS

31 knees (mean age 40; 22-68)
followed mean 4 years (range, 2-7 yrs) postop

Cincinnati Knee Rating System SYMPTOMS, FUNCTION

FACTOR	POINTS	PREOP	F.U.	P
Pain*	0-10	1.9 ± 0.9	5.6 ± 1.5	< 0.0001
Swelling	0-10	2.7 ± 1.5	5.5 ± 1.9	< 0.0001
Patient perception	1-10	3.0 ± 1.2	7.6 ± 2.1	< 0.0001
Walking	0-40	26 ± 8	39 ± 3	< 0.0001
Stair-climbing	0-40	9 ± 12	34 ± 8	< 0.0001
Squatting, kneeling	0-40	4 ± 8	19 ± 15	< 0.001

*2/31 (6%) pain ADL

SPORTS Before and After PFA

TYPE OF SPORT	FREQUENCY	PREOP* (no.)	FU (no.)
Low impact (swimming, cycling, aerobics)	1-3 days/mo	0	5
	1-3 days/wk	3	10
	4-7 days/wk	3	11
High-impact (jumping, pivoting, cutting)	1-3 days/wk	1	1
Not participating in any sports		24	4
Change in sports activity level at follow-up			
Increased, no knee problems			20
Same, no knee problems			4
Playing with knee symptoms			3
Did not return because of knee condition			3
Did not return non-knee related reasons			1

*All were participating with symptoms and functional limitations.

No effect outcomes

- Concomitant patellofemoral realignment procedure
- Pre-existing comorbidity

No symptomatic subluxations or dislocations

RESULTS (Continued)

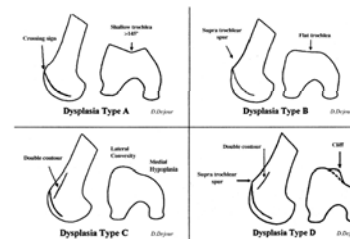
OCCUPATIONS Before and After PFA

WORK LEVEL	PREOP* (no.)	FU (no.)
Very light - light	10	15
Moderate - heavy	5	2
Disabled due to knee condition	8	3
Not working due to reasons not related to knee condition	8	11
*All patients except one who were working had knee-related symptoms and/or functional limitations.		
Change in occupational level at follow-up		
Increased, no knee problems		5
Same, no knee problems		10
Decreased, no knee problems		1
Working with knee symptoms		1

Conclusion: high 85% return to work activities in employed subgroup

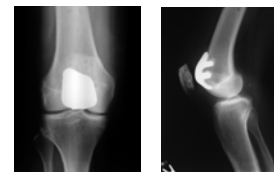
RADIOGRAPHIC FINDINGS

Preop Patella Alta - 3 knees, Infera - 2 knees
Dejour: A - 19 knees, B - 7 knees, C - 5 knees
39% severe dysplasia (B, C)



Follow-up

Normal position PFA prosthesis all knees
IKDC rated A-B and K-L rated 0-1 in 97% knees
Patella Alta - 2 knees, Infera - 3 knees



SUBSEQUENT OPERATIVE PROCEDURES

2 TKA 1 Lateral unicondylar replacement
1 MPFL recon 3 Arthroscopic scar tissue releases

COMPLICATIONS - FAILURES

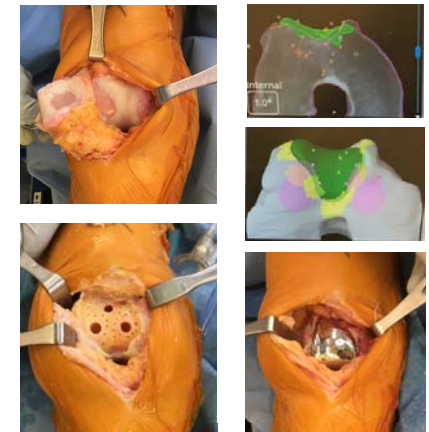
1 Infection 2/33 (6%) conversion TKA

DISCUSSION

1. High patient perception rating: mean 3.1 pre, 7.6 post (1-10 scale)
2. High participation light sports: pre 22%, post 87%
3. High return work employed subgroup: 85%
4. CRPS preoperative in 6 (18%)
Treat before PFA, recognize return CRPS symptoms postop, knee symptoms improve with PFA
5. Articular cartilage restoration failed, requiring PFA
7 (21%) knees, mean age 32.7 (23-47)
6/7 improved, returned light sports/work; 1 CRPS symptoms f.u.

Operative Procedure Advantages:

- Trochlear dysplasia corrected via PFA implant
- No tibial tubercle correction required for patella alta
- Correct soft tissue (MPFL) deficiency when required
- PF malalignment, z-plasty lateral release commonly required



Potential future problem:

- Knee flexion > 90 deg, patella prosthesis contacts femoral condyles, may produce alterations in cartilage
- Avoid high knee flexion activities postoperatively

CONCLUSIONS

- Robotic PFA is a successful treatment option younger active patients isolated PF arthritis
- Allows return to low-majorty recreational activities and occupations in the majority

REFERENCES

Noyes FR, Barber-Westin SD: Unicompartmental patellofemoral replacement. In Noyes' Knee Disorders: Surgery, Rehabilitation, Clinical Outcomes, 2nd Ed, Elsevier, pp. 1036-1057, 2017.