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KONKUK UNIVERSITY MEDICAL CENTER

Return to Sports and Work after Distraction Arthroplasty Combined with Lateral Meniscal Allograft in Active Population with Advanced Lateral Osteoarthritis

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Faculty Disclosure Information

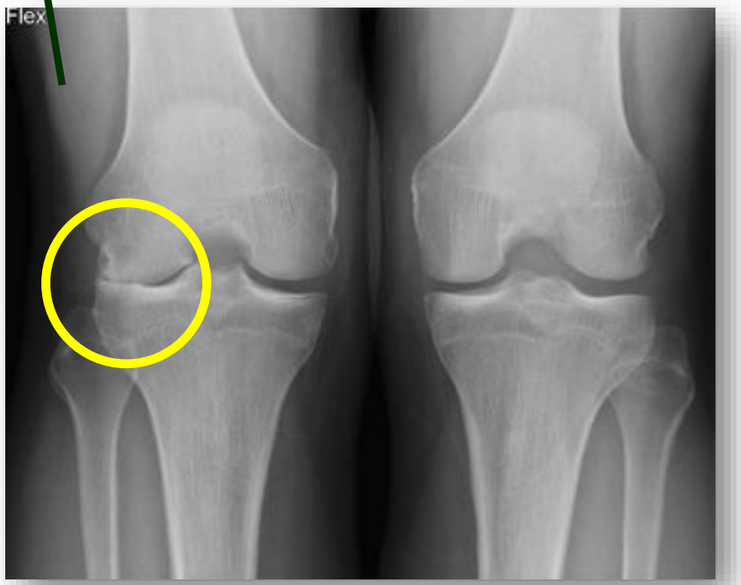
- There is no conflict of interests.

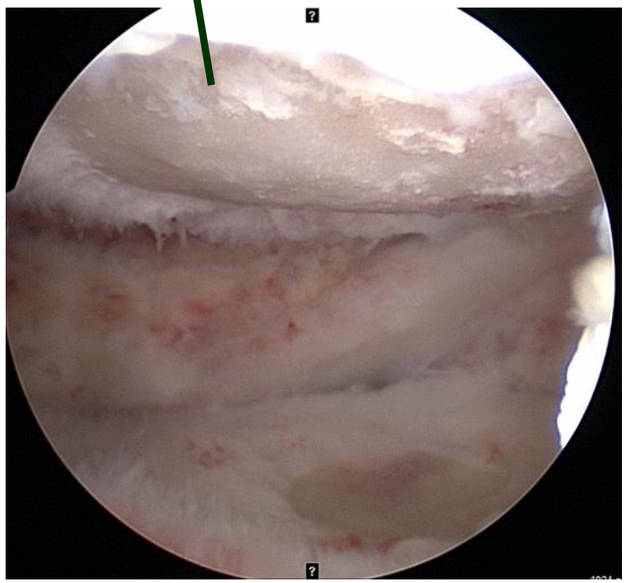
Introduction

What is your choice for active and young patients?

Lateral meniscus deficiency with advanced lateral osteoarthritis (OA)

- ✓ Lateral joint space narrowing without mal-alignment
- ✓ Large cartilage lesion (Gr 4)





Introduction: Distraction Arthroplasty

Knee Surg Sports Traumatol Arthrosc (2011) 19:1823–1829
DOI 10.1007/s00167-011-1403-6

KNEE

Unload it: the key to the treatment of knee osteoarthritis

Craig Waller · David Hayes · Jon E. Block · Nicholas J. London

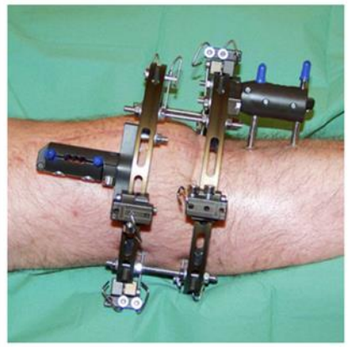


Fig. 4 Knee joint distraction

Review

Distraction to treat knee osteoarthritis

Charles-Henri Flouzat-Lachaniette*, François Roubineau, Clémence Heyberger, Charlie Bouthors

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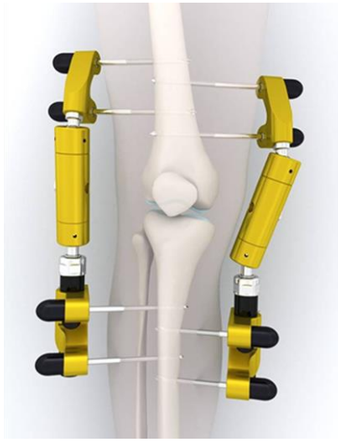


Technologies that **“unload”** the joint may **reverse the structural damage**, which is the cardinal feature of advanced OA.

Reestablishing a favorable local mechanical environment may not only **delay the requirement for an invasive procedure.**

Purpose

to report the **outcomes of DA plus lateral meniscal allograft transplantation (MAT) combined with cartilage repair** in active patients with advanced osteoarthritis

to evaluate the clinical efficacy of DA and its ability to allow **return to sports (RTS) and return to work (RTW)** for patients

Hypothesis

DA combined with lateral MAT would provide **improvements in clinical and radiological outcomes and enable RTS and RTW for most patients.**

Methods (Inclusion and Exclusion)

✓Case series (a total of **21 patients**)

Inclusion

① age ≤ 50 years

② lateral meniscus–deficient knee

③ duration of symptoms within 3 years

④ moderate joint space narrowing

(50–75% loss of JSW)

① mechanical axis deviation < 5°

② no ligament laxity

Exclusion

① mechanical axis deviation > 3° (n=1)

② No follow-up magnetic resonance imaging (MRI) (n=3)

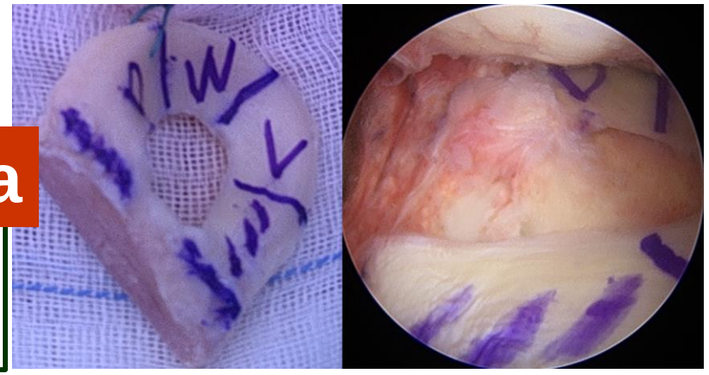
③ Incomplete clinical data (n=2)

④ follow-up durations < 2 years

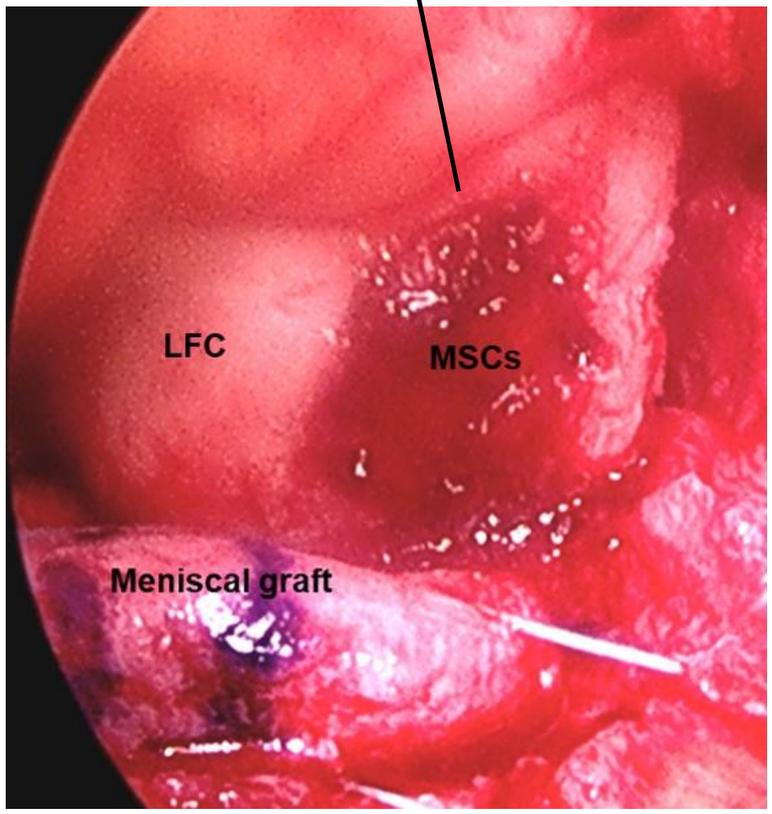
Methods (Surgical Techniques)

a Lateral MAT
b Cartilage repair
c Distraction arthroplasty

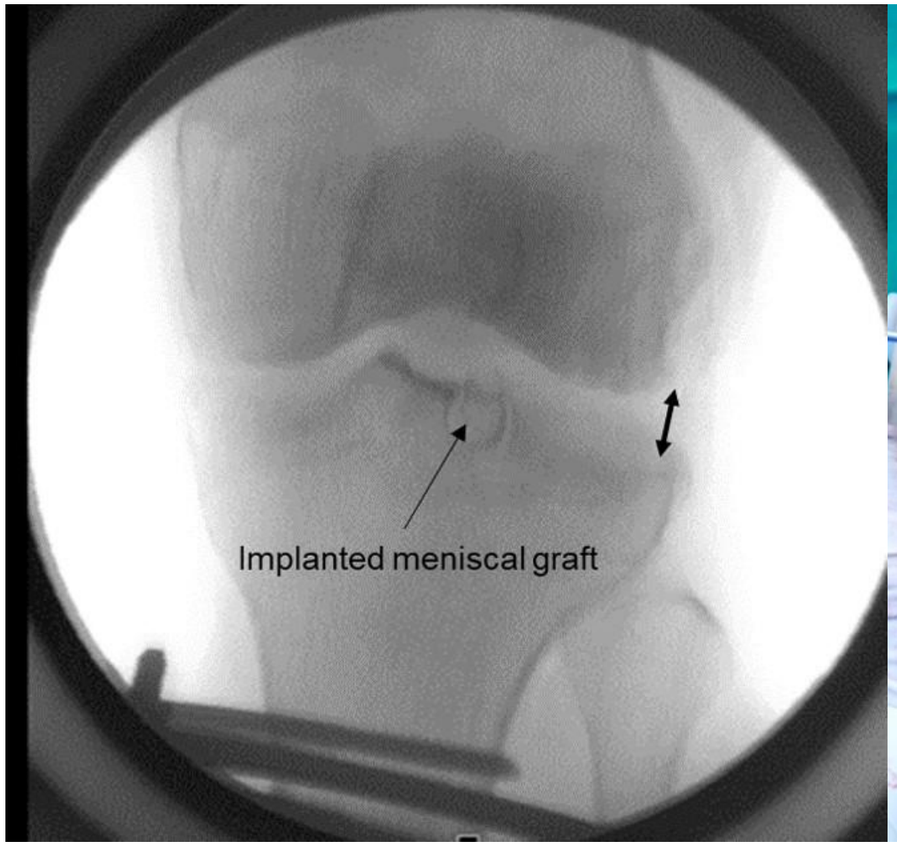
a



b human umbilical cord blood–mesenchymal stem cells (hUCB-MSCs)



c 3-5mm joint distraction using Ilizarov external fixator (RISC RTO, Kurgan, Russia)



Methods

X- rays

Before surgery, 6 and 12 months after surgery, and every year thereafter

✓ **Joint space width (JSW) analysis**

1) Central JSW of lateral compartment on weight-bearing full extension view

From the center of the femoral condyle to the center of tibial plateau

2) JSW at lateral edge on Rosenberg view

From the lateral edge of femoral condyle to the lateral edge of tibial plateau

3) Progression of joint space narrowing (JSN) assessment

4) Kellgren-Lawrence grade

Statistical analysis

- ✓ SPSS software (IBM SPSS Statistics 21; IBM Corp, Somers, NY)
- ✓ paired t-test or Wilcoxon signed-rank test : Preoperative and postoperative parametric or non-parametric variables
- ✓ the kappa value and classified as excellent (0.81–1.00), substantial (0.61–0.80), moderate (0.41–0.60), fair (0.21–0.40), and slight (0–0.21)

Magnetic Resonance Imaging (MRI)

3 times: preoperatively, 8 weeks and 12 months postoperatively

- ✓ **Graft extrusion**
- ✓ **Cartilage loss of the lateral compartment**
- ✓ **Cartilage regeneration (ICRS grading system)**

Clinical evaluations

- ✓ **Before surgery, 6 and 12 months after surgery, and every year thereafter**
- ✓ **Subjective knee function**

  Lysholm score, International Knee Documentation Committee (IKDC) knee score, Tegner activity scale(TAS), Questionnaires about sports and work (RTS and RTW), Satisfaction

- ✓ **Objective knee function**

  Isokinetic strength test, Single leg hop for distance test, Single leg vertical jump test

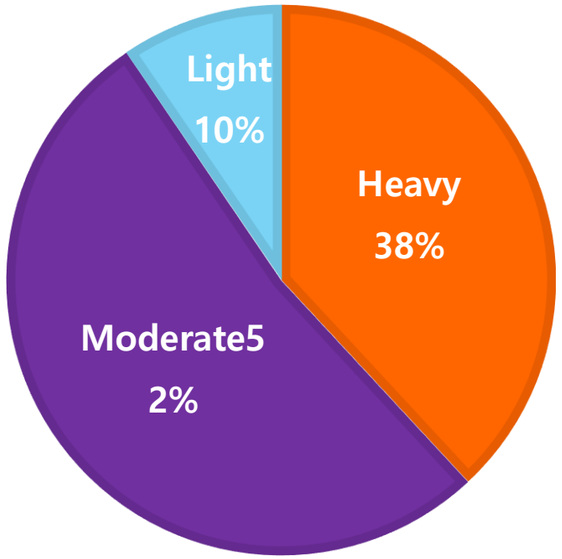
Results (Demographic and clinical characteristics)

Age (years)	37.2 ± 6.9
Sex, male/female	16/5
Body mass index (kg/m^2)	23.4 ± 3.5
Diagnosis of discoid meniscus, n (%)	17 (81%)
Clinical follow-up duration (months)	38.3 ± 8.4
Lysholm score before DA plus MAT	58.4 ± 8.2
IKDC subjective score before DA plus MAT	52.8 ± 8.7
Best TAS score during 5 years before DA plus MAT	**6.8 ± 1.0**
TAS score 6 months before DA plus MAT	4.4 ± 0.7

Best Tegner Activity Scale

6.8

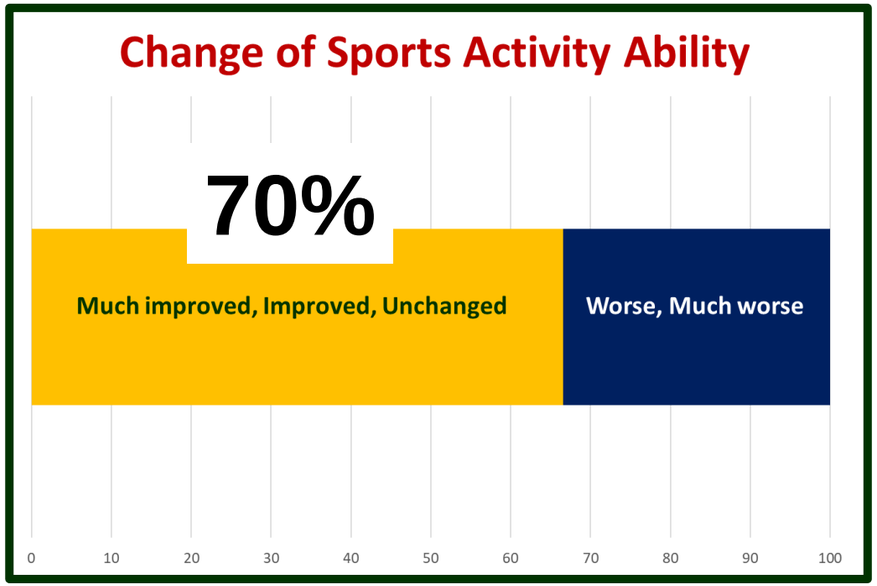
Best Occupation Intensity



DA, distraction arthroplasty; MAT, meniscal allograft transplantation; IKDC, International Knee Documentation Committee; TAS, Tegner activity scale

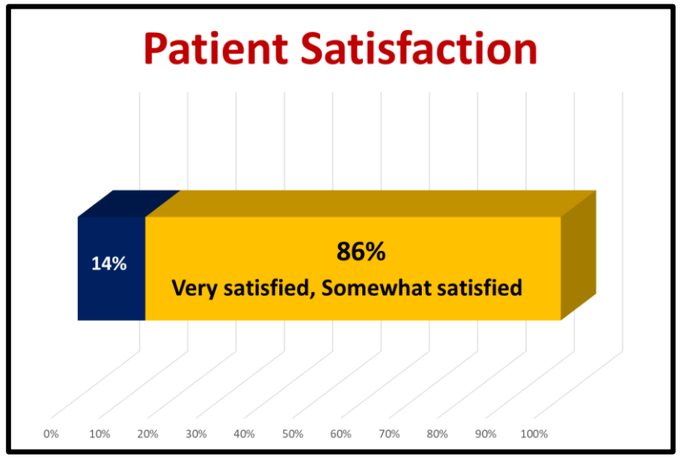
Results (Return to sports)

	12 Months	Last follow-up
Tegner activity scale	5.3 ± 0.9	5.9 ± 1.1
Rate of return to any sports activity, n (%)	18 (87.5%)	21 **(100%)**
Rate of return to the best sports activity level during 5 years before DA plus MAT, n (%)	8 (38.1%)	11 **(52.4%)**
Sports activity ability compared with the best level during 5 years before DA plus MAT, n (%)		
Much improved		
Improved	1 (4.8%)	1 (4.8%)
Unchanged	2 (9.5%)	3 (14.3%)
Worse	6 (28.6%)	10 (47.6%)
Much worse	10 (47.6%)	6 (28.6%)
	2 (9.5%)	1 (4.8%)



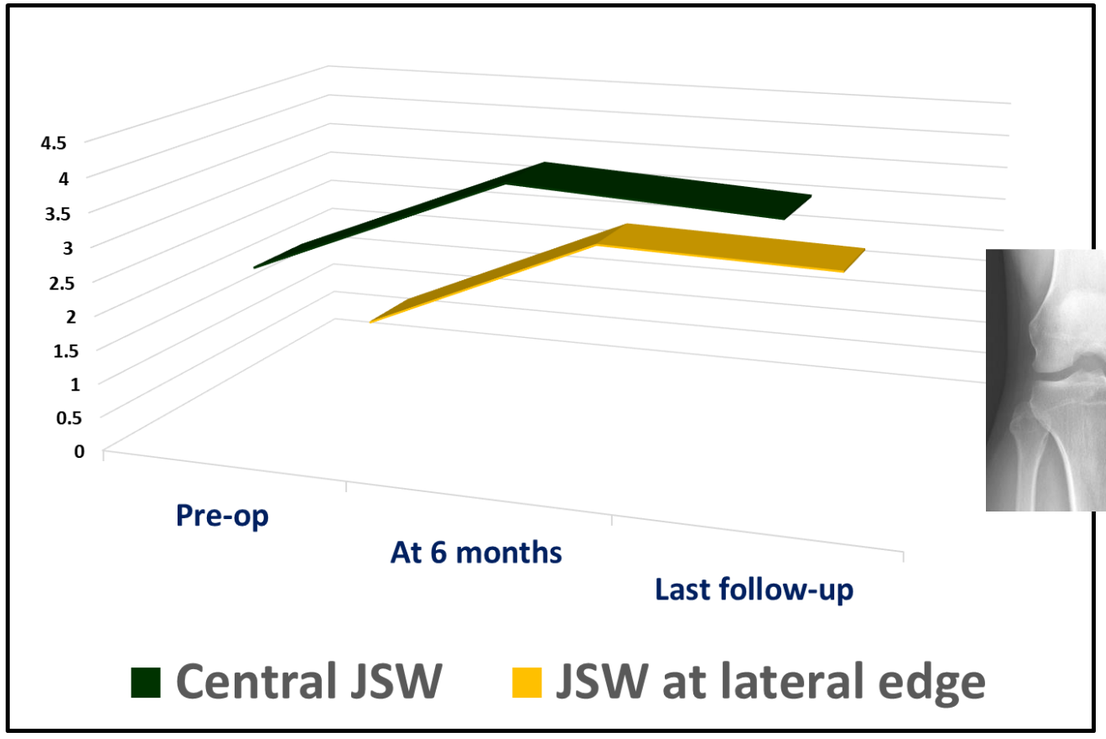
Results (Return to work and patient satisfaction)

	6 Months	Last follow-up
Rate of return to any work, n (%)	19 (90.5%)	21 **(100%)**
Rate of return to the best level of occupation intensity during 5 years before DA plus MAT, n (%)	8 (38.1%)	15 **(71.4%)**
Occupation intensity, n (%)		
Heavy	4 (19%)	7 (33.3%)
Moderate	12 (57.1%)	11 (52.4%)
Light	5 (23.8%)	3 (14.3%)
Sedentary	0	0
Satisfaction, n (%)		
Very satisfied	4 (19%)	12 (57.1%)
Somewhat satisfied	6 (28.6%)	6 (28.6%)
Neither satisfied nor dissatisfied	9 (42.9%)	2 (9.5%)
Somewhat dissatisfied	2 (9.5%)	1 (4.8%)
Very dissatisfied	0	0



Results (Trend of central JSW and JSW at the lateral edge measured on Rosenberg)

	Preoperative central JSW	Preoperative JSW at the lateral edge	Central JSW 6 months postoperatively	JSW at the lateral edge 6 months postoperatively	Central JSW at the last f/u	JSW at the lateral edge at the last f/u
Mean (mm)	2.6 ± 1.2	0.8 ± 0.5	4.1 ± 1.4	2.4 ± 1.2	3.9 ± 1.8	2.3 ± 1.0



Conclusion

All patients who underwent distraction arthroplasty plus lateral MAT combined with cartilage repair returned to any sports and work at the last follow-up. Significant improvements in clinical outcomes and the radiographic joint space width were observed.

This one-stage joint salvage treatment is a promising option for young and active patients with advanced OA who wish to return to high levels of sports activity and occupation intensity (≥ Tegner activity scale 4).

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