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# MACI Case Series in Patients Aged 40-55

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## Disclosures:

### Deryk Jones, MD

- Active Implants: Paid presenter or speaker
- Arthrex, Inc: Paid presenter or speaker
- Biorez: Stock or stock Options
- CONMED Linvatec: Paid presenter or speaker
- DePuy, A Johnson & Johnson Company: Paid presenter or speaker
- Genzyme: Paid presenter or speaker; Research support
- Linvatec: Paid presenter or speaker
- Mitek: Paid consultant; Paid presenter or speaker
- Musculoskeletal Transplant Foundation: Board or committee member;  
Paid presenter or speaker



# Purpose

- Matrix-induced autologous chondrocyte implantation (MACI) is a regenerative procedure aimed to recreate a hyaline-like repair tissue, restoring a biologically and biomechanically valid articular surface with durable clinical results.
- The purpose of this study is to assess patient reported outcome measures (PROMS) in a series of patients aged 40 to 55 to characterize and elucidate results when using the MACI graft in place of the previous ACI or CACI “sandwich” procedures.



# Methods & Materials

- Cohort study of prospectively collected data
- Inclusion criteria:
  - Patients aged 40-55 undergoing MACI procedures
  - Minimum 6-month follow-up
- Primary endpoint defined improvement of pain scores as measured at a min. 6M post-operative compared to preop
- Secondary endpoints included IKDC, KOOS, Lysholm, and SF-12 scores.
- Stats: generalized linear mixed model with a Poisson distribution and a random patient effect to account for correlations over time.
- All P-values adjusted for multiple comparisons using the Tukey-Kramer method with  $\alpha < 0.05$  considered statistically significant



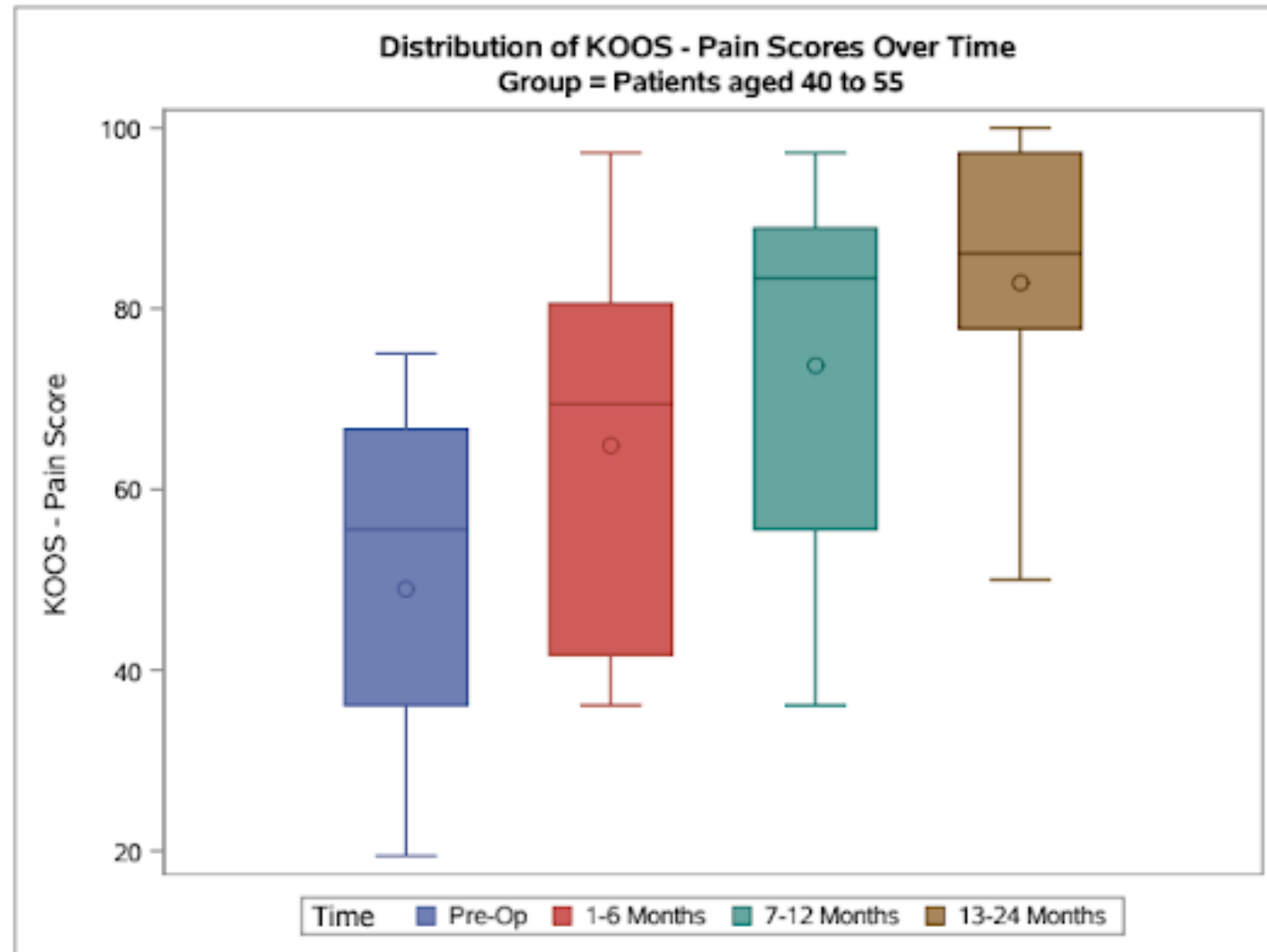
# Results

## Pre-operative and post-operative outcomes among MACI patients 40-55 years of age

Outcome	Pre-op	Months Post-Op		
		1-6	7-12	13-24
	<b>(N=11)</b>	<b>(N=11)</b>	<b>(N=11)</b>	<b>(N=11)</b>
Pain Severity, mean (SD)	5 (2.3)	4.2 (2)	3.4 (2.1)	3.1 (2.5)
IKDC Function, mean (SD)	29.2 (11)	43.7 (15.5) <sup>b</sup>	51.9 (15.7) <sup>c</sup>	57.5 (15.5) <sup>c</sup>
Lysholm, mean (SD)	43.9 (12.9)	55.5 (21.2)	65.7 (18.6) <sup>b</sup>	75.3 (17.6) <sup>c</sup>
KOOS-Pain, mean (SD)	49 (19.1)	64.9 (22.1)	73.7 (20.4) <sup>a</sup>	82.8 (16) <sup>c</sup>
KOOS-Symptom, mean (SD)	49 (21.1)	58.8 (24.8)	74.4 (21.5) <sup>a</sup>	76.8 (14.4) <sup>b</sup>
KOOS-ADL, mean (SD)	55.9 (24.3)	76.2 (18.7) <sup>a</sup>	80.2 (17.1) <sup>a</sup>	86 (15.2) <sup>b</sup>
KOOS-Sports, mean (SD)	24.5 (24.6)	37.3 (33.2)	53.6 (24.6)	52 (28.5)
KOOS-QOL, mean (SD)	17 (16.1)	35.8 (28.7)	40.3 (28.7)	45.6 (23) <sup>a</sup>
PSF-12, mean (SD)	32.6 (5.4)	37 (9.4)	38.3 (8.8)	43.9 (8.7) <sup>b</sup>
MSF-12, mean (SD)	49.7 (7.6)	49.9 (10.2)	56.2 (8.9)	56.2 (9.3)
<sup>a</sup> P value < 0.05				
<sup>b</sup> P value < 0.01				
<sup>c</sup> P value < 0.001				



# Results



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# Key Conclusions

- 11 patients mean age 43.9 years underwent MACI for symptomatic osteochondral lesions with mean follow up 23.4 months (14-51 months)
- Statistically significant improvements were noted at most recent follow up in 7 of 10 outcome measures
- MACI has clinically significant results at 2-year post-operative follow up in improving patient reported outcome measures in patients aged 40 to 55





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## References:

1. Kon E, Filardo G, Di Martino A, Marcacci M. ACI and MACI. *J Knee Surg.* 2012 Mar;25(1):17-22. doi: 10.1055/s-0031-1299651. PMID: 22624243.
2. Zeifang F, Oberle D, Nierhoff C, Richter W, Moradi B, Schmitt H. Autologous chondrocyte implantation using the original periosteum-cover technique versus matrix-associated autologous chondrocyte implantation: a randomized clinical trial. *Am J Sports Med.* 2010 May;38(5):924-33. doi: 10.1177/0363546509351499. Epub 2009 Dec 4. PMID: 19966102.
3. Pascual-Garrido C, Slabaugh MA, L'Heureux DR, Friel NA, Cole BJ. Recommendations and treatment outcomes for patellofemoral articular cartilage defects with autologous chondrocyte implantation: prospective evaluation at average 4-year follow-up. *Am J Sports Med* 2009; 37 (1, Suppl 1) 33S-41S.
4. Peterson L, Minas T, Brittberg M, Nilsson A, Sjögren-Jansson E, Lindahl A. Two- to 9-year outcome after autologous chondrocyte transplantation of the knee. *Clin Orthop Relat Res* 2000; (374) 212-234.
5. Gooding CR, Bartlett W, Bentley G, Skinner JA, Carrington R, Flanagan A. A prospective, randomised study comparing two techniques of autologous chondrocyte implantation for osteochondral defects in the knee: Periosteum covered versus type I/III collagen covered. *Knee* 2006; 13 (3) 203-210.
6. Kon E, Delcogliano M, Filardo G, Busacca M, Di Martino A, Marcacci M. Novel nano-composite multilayered biomaterial for osteochondral regeneration: a pilot clinical trial. *Am J Sports Med* 2011; 39 (6) 1180-1190.

