

# Failure and Complication Rates Following Meniscal AllInside and Inside-Out Repairs: A Systematic Review and Meta-Analysis

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#### DISCLOSURES



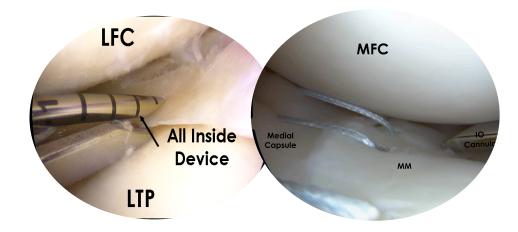
Authors Juan Bernardo Villarreal-Espinosa, Rodrigo Saad Berreta, Lucas Pallone, Jared Rubin, Felicitas Allende, Fernando Gómez-Verdejo, Zeeshan A. Khan, Sachin Allahabadi do not possess any potential conflicts of interest.

Jorge Chahla reports a relationship with American Orthopaedic Society for Sports Medicine: Board or committee member; Arthrex, Inc: Paid consultant; Arthroscopy Association of North America: Board or committee member; CONMED Linvatec: Paid consultant; International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine: Board or committee member; Ossur: Paid consultant; Smith & Nephew: Paid consultant; Paid presenter or speaker

### **OBJECTIVES**

#### To examine:

- Failure
- Complication rates
- Patient reported outcome measures (PROMs)
  - International Knee Documentation Score (IKDC)
  - Tegner Score

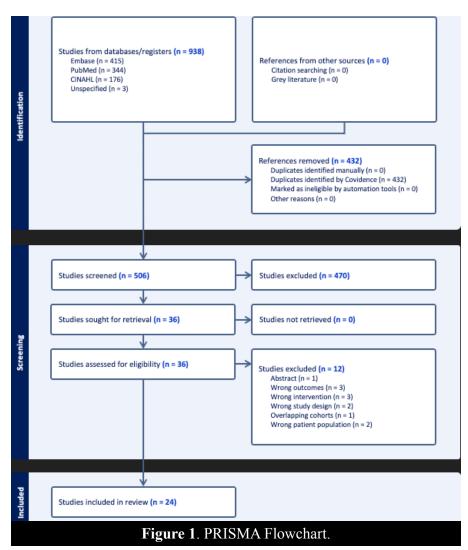


All inside (AI) Vs. Inside Out (IO)

Meniscal Repair

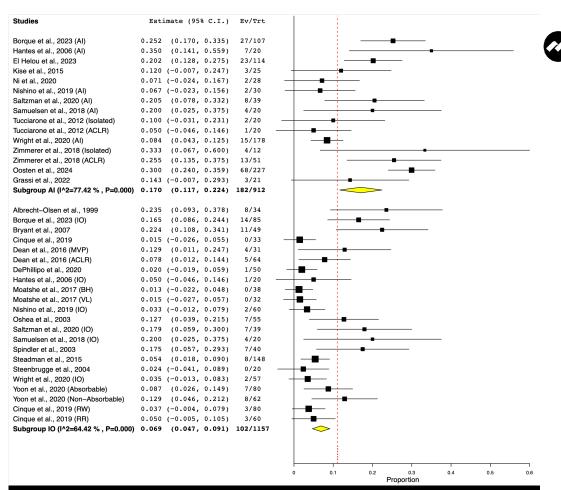
#### **METHODS**

- PRISMA Guidelines
- Inclusion:
  - Level I-III (comparative)
  - Reporting outcomes after all-inside vs. inside out meniscal repair
  - Non dart, arrow, screw, or hook-based Al devices.
- MINORS/GRADE
- Fixed/Random-effects meta-analysis



## RESULTS

- 24 studies
  - 912 AI
    - Mean follow-up: 22-192 months
    - Failure rate: 5-35%
      - 5-34% in concomitant ACLR
  - 1,117 IO
    - Mean follow-up: 18.5-155 months
    - Failure rate: 0-25%
      - 0-12.9% in concomitant ACLR

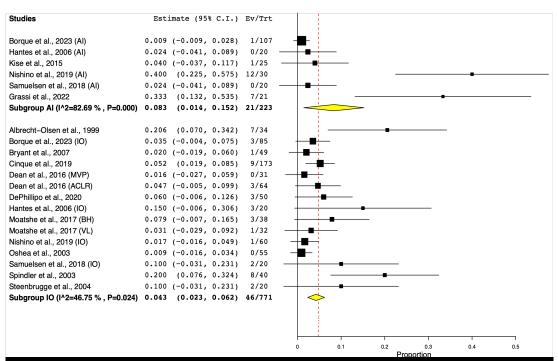


**Figure 2**. Single-arm forest plot representing meniscal failure rates for comparative and non-comparative level of evidence I-III studies.

#### RESULTS



- 24 studies
  - 912 AI
    - Mean follow-up: 22-192 months
    - Complication rate: 0-40%
    - PO Tegner: 4-7 / IKDC: 81.2-93.8
  - 1,117 IO
    - Mean follow-up: 18.5-155 months
    - Complication rate: 0-20.5%
    - Postoperative Tegner: 4-8 / IKDC: 89.6-94



**Figure 3**. Single-arm forest plot representing meniscal complication rates for comparative and non-comparative level of evidence I-III studies.

## RESULTS

Data pooling (n=6 studies)

Failure

• AI: 15.9%

• IO: 11.1%

Complications

• AI: 7.3%

· 10: 4.8%

	All-Inside		Inside-Out			Odds ratio	Odds ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% C	M-H, Fixed, 95% CI
Borque et al. 2023	27	107	14	85	46.2%	1.71 [0.83 , 3.52	2]
Hantes et al. 2006	7	20	1	20	2.6%	10.23 [1.12 , 93.34	·]
Nishino et al. 2019	2	30	2	60	4.9%	2.07 [0.28 , 15.48	3]
Saltzman et al. 2020	8	39	7	39	22.0%	1.18 [0.38 , 3.65	<u> </u>
Samuelsen et al. 2018	4	20	4	20	12.7%	1.00 [0.21 , 4.71	
Wright et al. 2020	15	178	2	45	11.6%	1.98 [0.44 , 8.98	<u> </u>
Total (95% CI)		394		269	100.0%	1.77 [1.09 , 2.89	oj 📥
Total events:	63		30				-
Heterogeneity: Chi <sup>2</sup> = 3	.49, df = 5 (	P = 0.62	); I <sup>2</sup> = 0%				0.01 0.1 1 10 100
Test for overall effect: Z = 2.30 (P = 0.02)							Favours All-Inside Favours Inside-Out

**Figure 4**. Meta-analysis of comparative studies comparing meniscal failure rates between all-inside and inside-out techniques.

Study or Subgroup  Borque et al. 2023	All-Inside		Inside-Out		Odds ratio		Odds ratio	
	Events	Total	Events	Total	Weight	M-H, Random, 95% C	I M-H, Rand	om, 95% CI
	1	107	3	85	26.3%	0.26 [0.03 , 2.52]	2]	
Hantes et al. 2006	0	20	3	20	23.5%	0.12 [0.01, 2.53	3]	_
Nishino et al. 2019	12	30	1	60	26.9%	39.33 [4.78, 323.51	1]	
Samuelsen et al. 2018	0	20	2	20	23.3%	0.18 [0.01 , 4.01	1]	
Total (95% CI)		177		185	100.0%	0.77 [0.04 , 15.39	9]	
Total events:	13		9					
Heterogeneity: Tau <sup>2</sup> = 7	7.54; Chi² =	16.18, df	= 3 (P = 0	.001); I <sup>2</sup> =	= 81%		0.005 0.1	1 10 200
Test for overall effect: Z	C = 0.17 (P =	= 0.86)			Favours All-Inside	Favours Inside-Ou		

**Figure 5**. Meta-analysis of comparative studies comparing complication rates between all-inside and inside-out techniques.

#### LIMITATIONS



- Heterogeneity in concomitant procedures
- Lack of uniformity in patient activity levels
- Inability to stratify results by tear type, location, augmentation strategies, and presence of chondral lesions
- Lack of uniformity in AI devices used

#### CONCLUSION



"The present study underscores comparable clinical success between Al and IO meniscal repair techniques, with both techniques demonstrating similar complication rates. However, the Al repair technique was associated with 1.77 times higher odds of failure compared to the IO cohort."



#### **THANK YOU!**

