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Title: Comparison of Open versus Arthroscopic Surgical Outcomes for Patellar Tendinopathy: A Systematic Review

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Background

- Chronic patellar tendinosis (Jumper's Knee): causes symptoms at inferior pole of the patella and proximal patellar tendon
- Incidence: 14-17% (32-44% of high-impact activity individuals)[1,2].
- Blazina scale[3] for severity of patellar tendinopathy symptoms:

Grade I	Pain after activity
Grade II	Pain before and after activity
Grade III	Functional impairment and pain
Grade IV	Rupture of the patellar tendon

Background (cont'd)

- Surgery indicated for cases refractory to conservative mgmt.
- Common procedures:
  - Open: distal pole resection, drilling of distal patellar apex, reinforcement, longitudinal incisions through the patellar tendon, surgical tendon stimulation.
  - Arthroscopic : tendon debridement, dorsal proximal tendon shaving, removal of inferior pole hypertrophic synovitis[4,5,6,7].

Aim: Compare updated literature outcomes of open and arthroscopic surgical interventions for patellar tendinopathy.

Materials & Methods

- PubMed, Embase, CINAHL, Scopus, and Cochrane databases
- Inclusion:
  - Surgical intervention with outcomes published 2000-Jan 2022
  - Mean F/U > 6 months,
  - Reported quantifiable outcomes measures:
    - Patient reported outcome measures (PROMs)
    - Subjective Success, Return to Sport (RTS) data
- Exclusion:
  - LOE < IV,
  - Studies on revision surgeries
  - Methodology Papers

Materials & Methods (cont'd)

- Data analysis/Storage in Excel, STATA
- Outcomes measured:
  - Victorian Institute of Sports Assessment (VISA-P), Lysholm, modified Blazina, Tegner, IKDC, SANE scores
  - Success, RTS rate, RTS time
- 2-tailed t-test with unequal variance for descriptive statistics
- No meta-analysis due to heterogeneity of surgical techniques

Results

Surgical Type	Follow-up (months)	RTS Rate (%)	p	RTS Time (months)	p	Success (%)	p
Arthroscopic (n=360)	48.4 ± 27.6	86.8 ± 13.3	.097	4.2 ± 1.06	**.002**	89.8 ± 5.4	.19
Open (n=210)	50.0 ± 31.8	74.9 ± 17.3		8.0 ± 2.3		86.4 ± 9.4	
Combined O+A (n=60)	30.4 ± 19.4	91.3*		>6		85.6 ± 4.6	

Table 1. Summarized findings between surgical intervention groups reported as weighted mean ± standard deviation.

*data only presented in 1 study, so average unavailable

Complication Type	Arthroscopic	Open	Combined
Wound Healing/Infx		2	
Algodystrophy		1	
Repeat Surgery	1	5	2
New onset PFPS	2		

Table 2. Types of complications reported in included studies and the number of instances within each group

Results – Comparative Studies

Paper (year)	n	Technique Notes	Mean RTS Rate (%)	Mean RTS Time (months)	Mean Success (%)
Willberg et al. (2011)	A (26)	Ultrasound/Color doppler (US/CD) guided arthroscopic shaving	87	2	86.8
	N (26)	US/CD guided sclerosing polidocanol injections x3	n/r	-	52.9
Bahr et al. (2006)	O (20)	wedge-shaped full-thickness excision of tissue	45	12	85.0
	N (20)	eccentric strength training (ESWT) 12 weeks minimum, gradual RTS @ 8 weeks	55	>12	75.0
Maffullli et al. (2014)	O (23)	**unilateral** tendinopathy/paratenon excision, Hoffa body dissection, longitudinal tenotomy	87.0	8.5 (±1.2)	91.3
	O (23)	**bilateral** tendinopathy/paratenon excision, Hoffa body dissection, longitudinal tenotomy	73.9	10.1 (±1.7)	82.6
Cucurulo et al. (2009)	O (54)	patellar tip resection.	88	7 (3-18)	94.0
	A (10)	shaving of retrotendinous tissue, excision of damaged tendon.	(pooled above)	5 (3-18)	100.0
Coleman et al. (2000)	O (29)	open tenotomy	54	10 (4-12)	81.0
	A (25)	arthroscopic tenotomy	46	6 (2-18)	96.0
Peers et al. (2003)	O (14)	Tenotomy, retrotendinous tissue resection	50	-	50.0
	N (14)	ESWT 3 sessions	61.5	-	71.4

Table 3. Results of Comparative Studies. Surgical groups resulted in higher success and shorter RTS compared to non-surgical interventions. Bilateral procedures were less successful than unilateral. Direct comparison of open and arthroscopic groups (2 studies) demonstrated longer RTS time and lower subjective success rate in Open. Of note, Cucurulo et al performed patellar bony work in open group.

(A): Arthroscopic (O): Open (N): Nonsurgical Control group

Results – PROM improvement

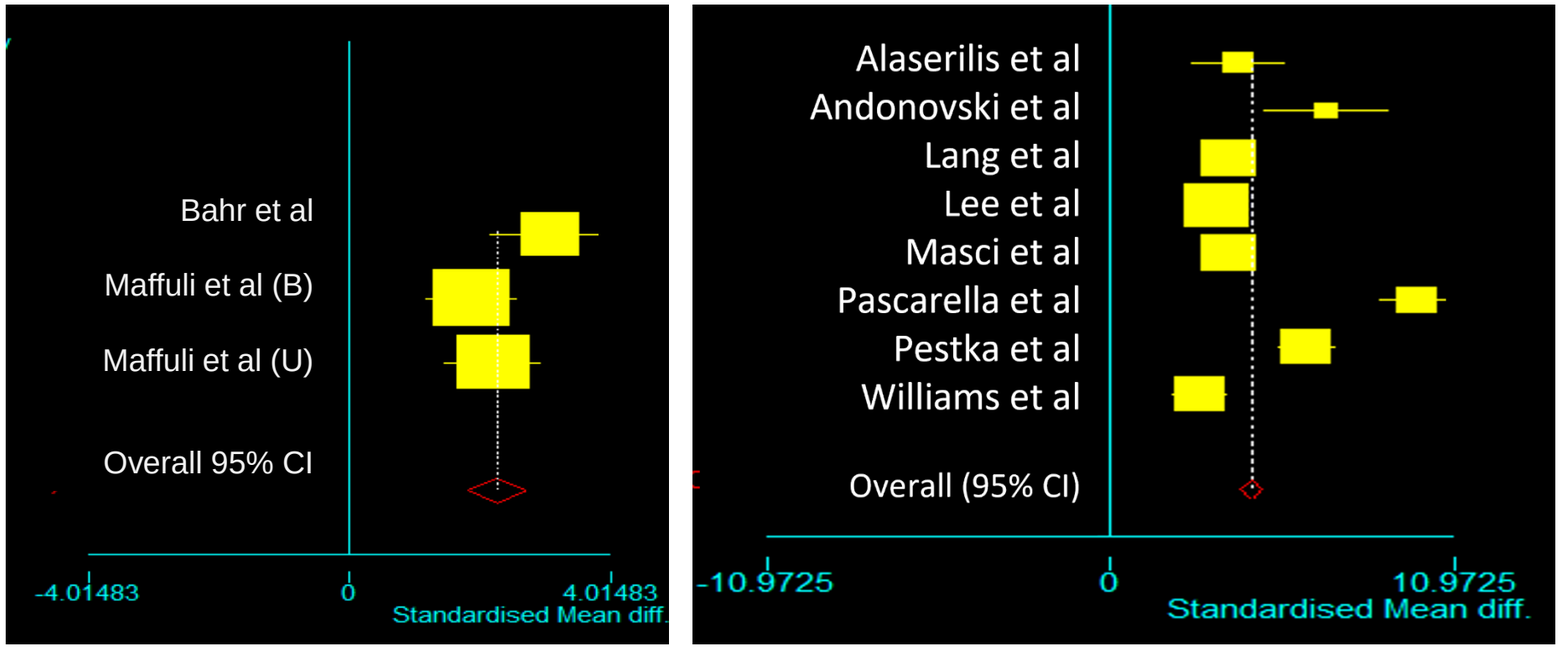

Figure 1. VISA-P scores significantly improved from preoperative conditions for Open (Left) and Arthroscopic (Right). Arthroscopic demonstrated higher SMD.

(B): Bilateral (U): Unilateral

Results

20 studies reported on 8 Open, 13 Arthroscopic, 2 combined O/A groups

Most important finding: Arthroscopic PT surgery leads to moderately higher RTS rates (87%) and significantly faster RTS time (4.2mo) than open surgery (75% and 8.0mo), with similarly high success and low complication rates

Conclusions

- Open, Arthroscopic, and Combined approaches all achieve high rates of success and RTS with minimal complications
- Quicker return to sport, better PROMs, and slightly fewer complications make arthroscopic procedures preferable if no extensive bony work is required
- Data heterogeneity limits ability to definitively identify which approach yields the best outcomes in short and long term
- Further study with randomized controlled trials using standardized operative techniques and post-op rehab are necessary before making definitive conclusions

Thank You!

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