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Complications Associated with Proximal Hamstring Tendon Repair: A Systematic Review

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Introduction

- Several potential complications of proximal hamstring tendon ruptures have been reported in the literature
- Paucity in the literature of the complication profile associated with proximal hamstring tendon repair
- Goal was to provide a comprehensive synthesis of all articles that have reported complications associated with proximal hamstring tendon repair
- **Purpose:** Identify the overall rate of complications following proximal hamstring tendon repair, to differentiate these complications into categories, and to compare the complication rates of open versus endoscopic repair



Methods

- Health science librarian developed search strategy
- Search conducted with PubMed, Medline (via Ovid), Embase (via Ovid), Web of Science Core Collection, and SPORTDiscus (via EBSCOhost)
- Date range inception – May 4, 2022
- Full-text articles obtained after initial screening
- All abstracts and full-text articles stored in Rayyan QCRI
- Articles extracted for study design, level of evidence, surgical approach (open vs. endoscopic), injury setting, chronicity of injury before repair, follow-up time, specific complications
- Overall complication rate calculated
- Complications further categorized into major/minor and open/endoscopic subcategories
- Complications aggregated and analyzed using descriptive statistics



Methods (continued)

Inclusion Criteria

- Published in English
- Level 4 evidence or higher
- Examine surgical repair of proximal hamstring tendon ruptures

Exclusion Criteria

- Nonoperative treatment
- Cadaveric studies
- Myositis ossificans
- Proximal hamstring tendinopathy
- Avulsion fractures of ischial tuberosity
- Proximal hamstring tendon reconstruction with allograft

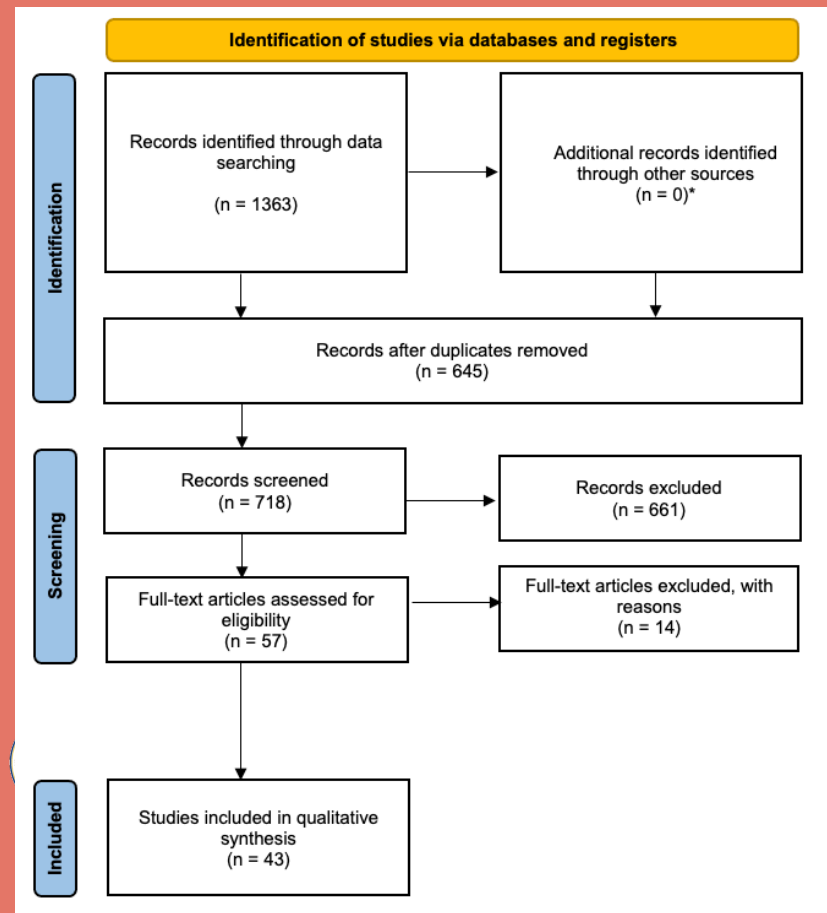


Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram illustrating study inclusion and exclusion

Results

- 43 studies met inclusion criteria
- Date range of studies: 1995-2022
- 15 (34.9%) prospective, 28 (65.1%) retrospective
- Level 4 case series 76.6% of included studies
- 2,823 surgeries
- 40 studies on open hamstring repair
- 3 studies on open + endoscopic hamstring repair
- 62.8% male, 37.2% female
- Overall complication rate: 15.4% (n = 436)



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Results (Major Complications)

Major complications: those that caused debilitating injury, required an operation, or were potentially life-threatening

Major complication rate: 4.6% (n = 129)

- 0.8% rate of re-rupture (n = 22)
- 0.8% re-operation rate (n = 23)
- 1.8% rate of sciatic nerve injury (n = 48)
- 0.9% rate of venous thromboembolism (VTE) (n = 25)
- 0.4% rate of deep infection (n = 11)

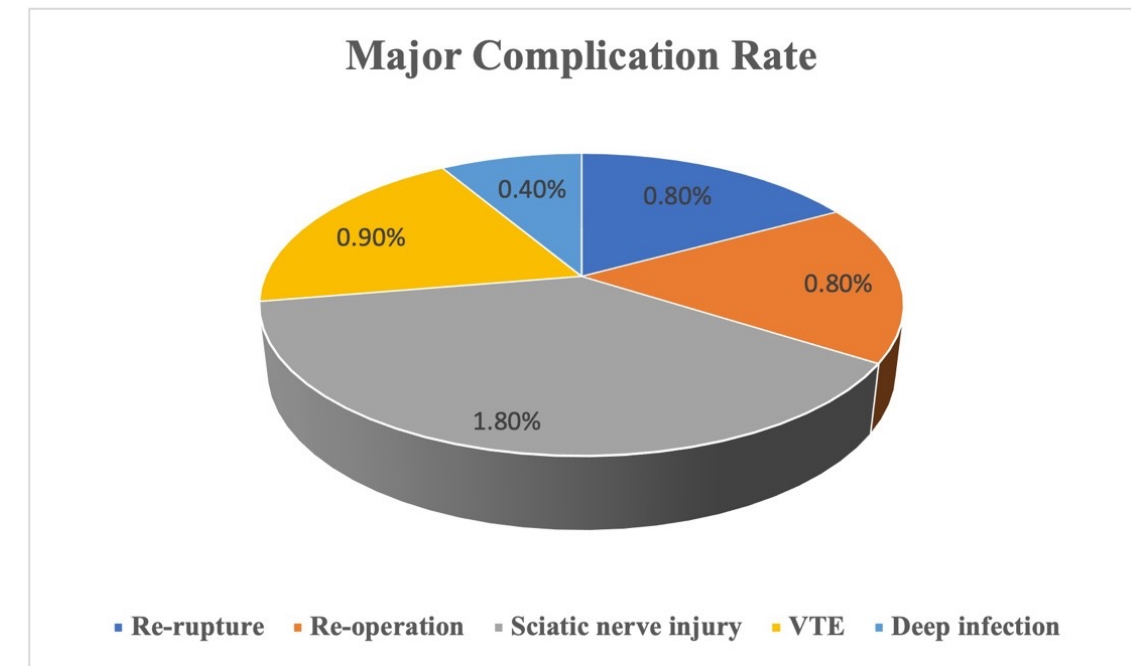


Figure 2. Percentages of major complications

Results (Minor Complications)

Minor complications: those that caused persistent symptoms without significant impairment, such as pain, numbness, superficial infection, and transient nerve injury

- Minor complication rate: 10.6% (n = 300)
- 2.5% rate of posterior femoral cutaneous nerve (PFCN) injury (n = 69)
- 2.2% rate of persistent sitting pain (n = 62)
- 2.3% rate of persistent hamstring myopathy (n = 65)
- 0.8% rate of hematoma/seroma formation (n = 23)
- 1.8% rate of peri-incisional numbness (n = 50)
- 1.1% rate of superficial infection (n = 31)

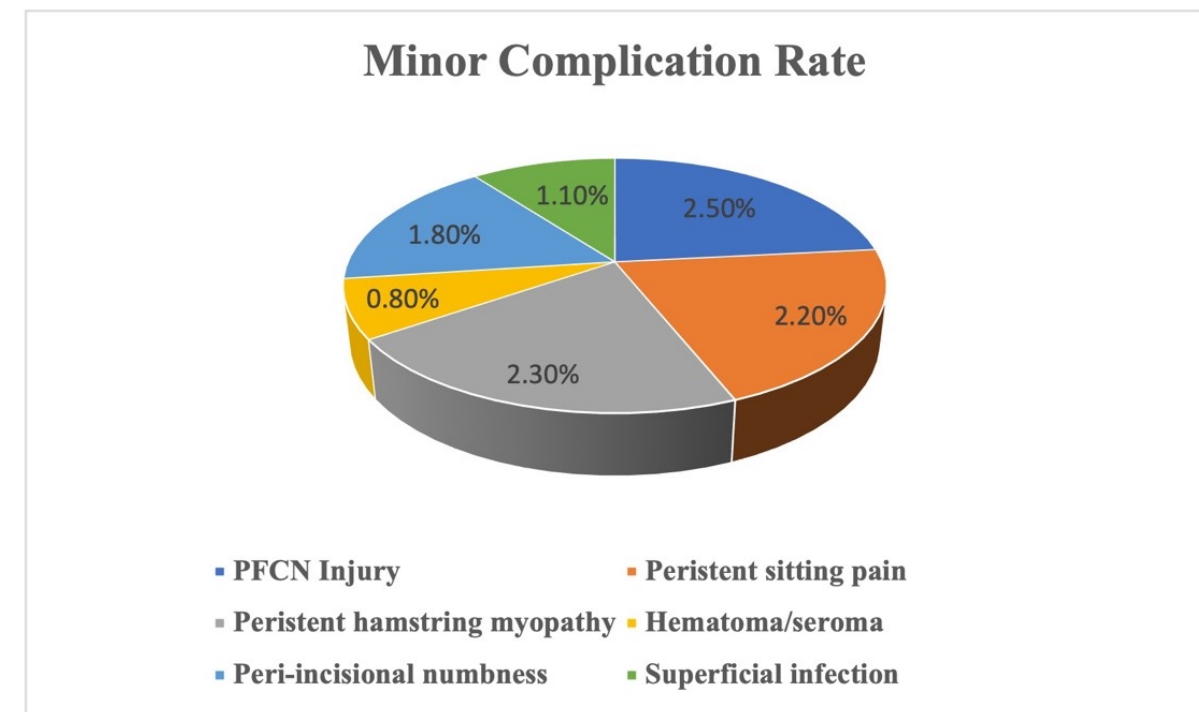


Figure 3. Percentages of minor complications

Results (Major and Minor Complications by Approach)

Figure 4. Comparison of major complication rates in endoscopic vs. open repair

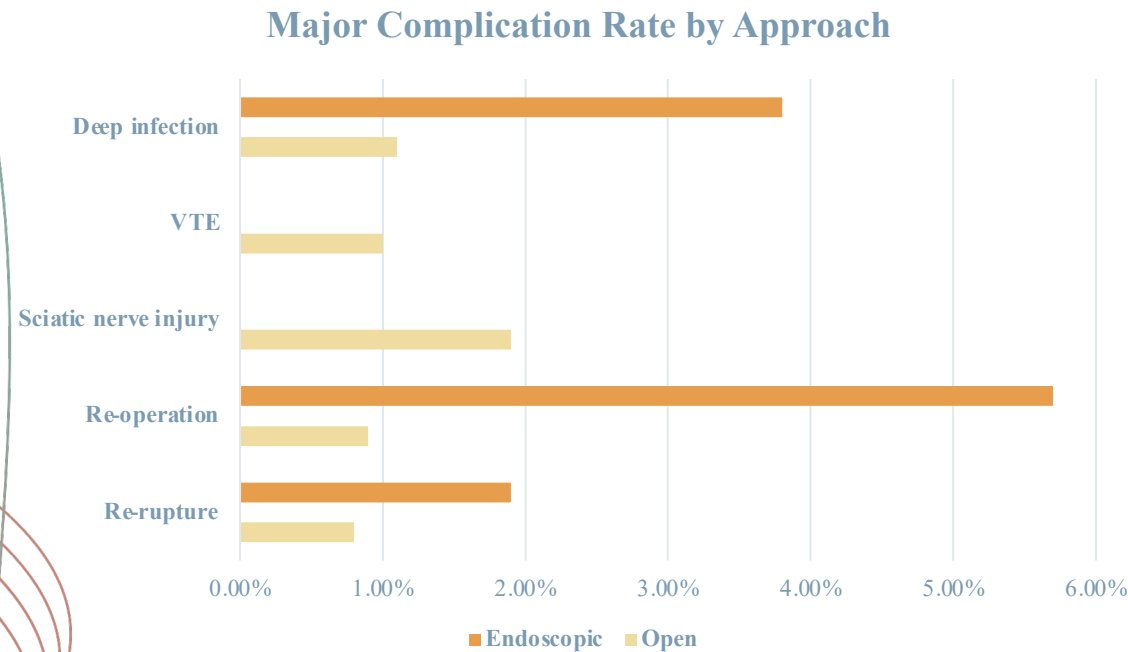
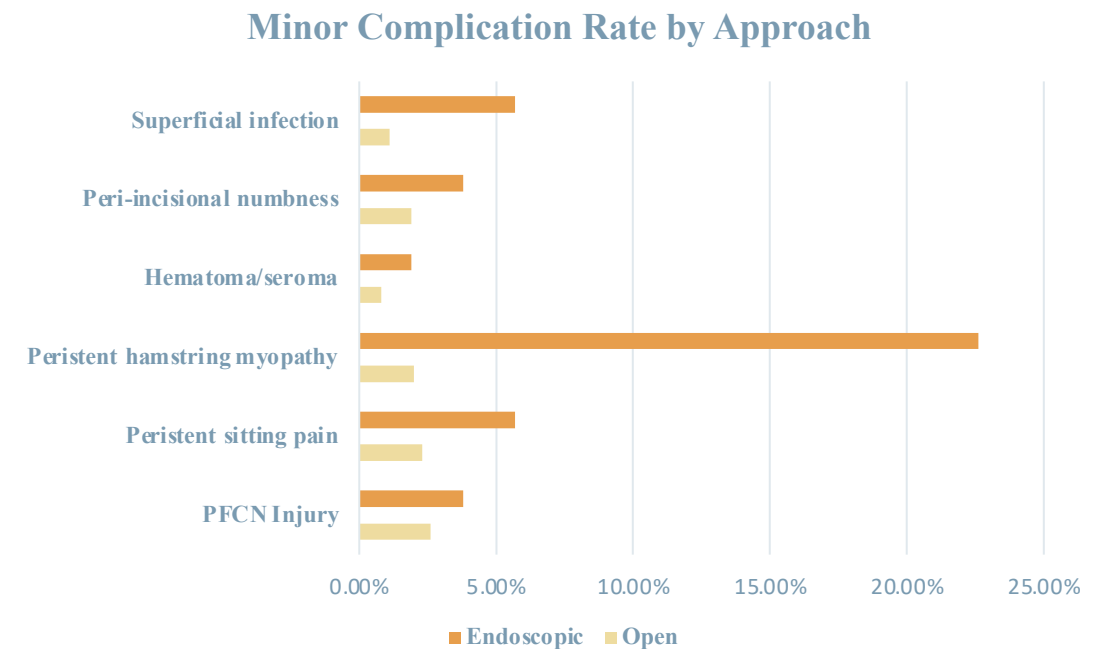


Figure 5. Comparison of minor complication rates in endoscopic vs. open repair



Endoscopic approach associated with higher:

- Overall complication rate (p = 0.012)
- Major Complication rate (p = 0.048)
- Minor complication rate (p < 0.001)



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Discussion / Limitations

- Despite successful outcomes associated with proximal hamstring tendon repair, there is a substantial risk of sustaining an intraoperative or postoperative complication
- Findings (15.4%) comparable to previous systematic reviews on proximal hamstring tendon repair that reported overall complication rates (15.7% Jokela et al¹) and (23.2% Bodendorfer et al²)
- Endoscopic repair associated with higher postoperative complication rates than open repair
- Paucity in existing literature on endoscopic repair for these types of injuries
- Significant heterogeneity in temporally defining an acute vs. chronic hamstring tendon injury
- Lack of clear classification of a major vs. minor complication



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Conclusion

- Proximal hamstring tendon repair is associated with an overall complication rate of 15.4%, including a 4.7% rate of major complications
- There was a statistically significant increase in complications for patients treated endoscopically compared to those who underwent an open repair



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2. Bodendorfer BM, Curley AJ, Kotler JA, et al. Outcomes After Operative and Nonoperative Treatment of Proximal Hamstring Avulsions: A Systematic Review and Meta-analysis. *Am J Sports Med*. 2018;46(11):2798-2808. doi:10.1177/0363546517732526



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