INPLASY

Comparative Outcomes of Endoscopic vs. Open Surgery for Insertional Achilles Tendinopathy: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - Fellowship fees from the organization.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 February 2025 and was last updated on 27 February 2025.

INTRODUCTION

Review question / Objective P: patients with insertional achilles tendinopathy, and conservative management fails after a sufficient period
I: Endoscopic surgery
C: Open surgery
O: Outcome measures, such as Ankle-Hindfoot Scale of American Orthopaedic Foot and Ankle Society (AOFAS), VISA-A, VAS…, as well as complications rate, mean time return to daily life and sports.

Rationale Insertional Achilles tendinopathy is a debilitating condition that affects both athletes and the general population, often requiring surgical intervention when conservative treatments fail. While both open and endoscopic procedures are commonly performed, there remains a lack of high-quality evidence directly comparing their clinical outcomes, complication rates, and recovery timelines. This study aims to fill this gap by conducting a systematic review and meta-analysis to compare these surgical approaches. By evaluating outcome measures such as AOFAS, VISA-A, and VAS scores, as well as complication rates and return-to-activity timelines, we seek to provide updated evidence to guide surgical decision-making. This study follows PRISMA guidelines and employs rigorous selection criteria to ensure a comprehensive and unbiased analysis of the available literature.

Condition being studied Insertional Achilles tendinopathy (IAT) is a chronic condition characterized by persistent hindfoot pain, restricted range of motion, and swelling, often associated with overuse, rigid heel counters, and pes cavovarus deformity. It commonly coexists with retrocalcaneal bursitis and Haglund's deformity—an abnormal bony enlargement of the posterior calcaneus that increases tendon irritation and degeneration. Insertional Achilles tendinopathy primarily affects individuals aged 20–60 years,

particularly athletes, accounting for 5%–18% of running-related injuries. Diagnosis combines clinical assessment with imaging, including X-rays for calcifications and deformities, ultrasound for tendon thickening and degeneration, and MRI for edema and marrow involvement. Conservative treatments such as eccentric exercises, extracorporeal shockwave therapy, orthotics, and injections aim to relieve symptoms and restore function, but surgery is recommended if nonoperative management fails after six months. Open surgery provides direct visualization for debridement and Haglund's resection but carries higher risks of wound complications, stiffness, and paresthesia. Endoscopic surgery, a minimally invasive alternative, offers smaller incisions, faster recovery, and reduced complications, though it requires a steeper learning curve. This study compares the long-term outcomes, complications, and recovery times of open versus endoscopic surgery to provide updated evidence for optimal surgical decision-making.

METHODS

Search strategy Two reviewers, Chen and Tzeng, independently conducted searches in PubMed, Cochrane Library, Scopus, ScienceDirect, Web of Science, and Embase from January 1, 2003, to December 1, 2024, using the following search terms: ("Haglund" OR "retrocalcaneal bursitis" OR "insertional Achilles tendinopathy") AND ("reinsertion" OR "reattachment" OR "debridement" OR "retrocalcaneal decompression"), as well as ("Haglund" OR "retrocalcaneal bursitis" OR "insertional Achilles tendinopathy") AND ("Endoscopy" OR "Arthroscopy" OR "Minimally invasive procedure"). They independently screened titles, abstracts, patient numbers, and full-text articles to identify eligible studies. Studies were included if they reported clinical outcomes of open or endoscopic surgical procedures for IAT and included at least 20 patients with a minimum follow-up of six months. Duplicate articles and non-English studies were excluded. Exclusion criteria comprised case reports, animal and cadaveric studies, commentaries, technical reports, and clinical studies lacking methodological details or sufficient data. Studies with fewer than 20 patients, those published before January 1, 2003, or those with a follow-up of less than six months were also excluded. Additionally, studies involving gastrocnemius recession, Zadek osteotomy, or flexor hallucis longus tendon transfer were not considered. To ensure comprehensive coverage, a snowballing technique was applied, manually screening relevant reviews, reference lists of included studies, and citing articles to identify additional eligible research. The primary outcome was the mean American Orthopaedic Foot & Ankle Society (AOFAS) score [25], a clinician-reported measure assessing pain, function, and alignment in foot and ankle conditions. Secondary outcomes included the average time to return to daily life or sports, complications, and other measures such as the Victorian Institute of Sport Assessment-Achilles Scale (VISA-A) [21], a patient-reported scale evaluating the severity of Achilles tendinopathy through pain, function, and activity levels, and the Visual Analogue Scale (VAS) [29], which assesses pain intensity. Chen and Tzeng independently extracted data from the selected studies, including the first author, publication year, country, study design, type of surgery, number of patients, procedure details, laterality, gender distribution, mean age, follow-up duration, diagnostic methods, intervention details, rehabilitation protocol, and mean time to return to daily life and sports.

Participant or population A patient with insertional Achilles tendinopathy who has failed to respond to six months of conservative treatment.

Intervention Endoscopic surgery.

Comparator Open surgery.

Study designs to be included cohort, case series.

Eligibility criteria

Inclusion criteria:
1, Studies reported clinical outcomes of either open or endoscopic surgical procedures for insertional achilles tendinopathy
2, A minimum of 20 patients in the studies
3, Studies with a follow-up period of at least six months
4, Studies published in English

Exclusion criteria:
1. Study type include case reports, animal studies, cadaveric studies, commentaries, technical studies, and clinical studies lacking methodological details or sufficient quantitative or qualitative data
2. Studies with fewer than 20 patients
3. Studies published before January 1, 2003
4. Studies with a follow-up period of less than six months
5. Studies involving gastrocnemius recession, Zadek osteotomy, or flexor hallucis longus tendon transfer were Excluded.

Information sources PubMed, Cochrane Library, Scopus, ScienceDirect, Web of Science, and Embase.

Main outcome(s) Ankle-Hindfoot Scale of American Orthopaedic Foot and Ankle Society (AOFAS).

Additional outcome(s)
1. Other outcome measures, such as VISA-A, VAS…
2. Complication rate
3. Mean time back to daily life and sports after surgery.

Data management Use Endnote for article collection and storage, Excel for organizing detailed study data, and Review Manager for AOFAS score meta-analysis.

Quality assessment / Risk of bias analysis The reviewers, Chen and Tzeng, assessed the articles independently. If they could not reach a consensus, a third reviewer, Wang, provided an independent evaluation.
The quality of the study was assessed using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) system [18], and the level of evidence was determined according to the Oxford Centre for Evidence-Based Medicine 2011 criteria [49]. The risk of bias was assessed using the Methodological Index for Non-Randomized Studies (MINORS) [61], which has a maximum score of 24 for comparative studies and 16 for single-group studies. Comparative studies were classified as having a high risk of bias if their total score was 16 or lower, while those with a score above 16 were considered to have a low risk of bias. For single-group studies, a total score of 12 or lower indicated a high risk of bias, whereas a score greater than 12 was deemed to reflect a low risk of bias.

Strategy of data synthesis We reported all continuous variables as mean values with standard deviation (SD) or range, including AOFAS scores, other measurements, mean time to return to daily life or sports, and complications. Continuous outcomes were pooled using the inverse variance weighting method and presented as mean differences with 95% confidence intervals. All analyses were conducted using random-effects models.
We compared the changes in AOFAS scores from preoperative to the final follow-up for each surgical procedure. Complications, including infection, paresthesia, hypertrophic scars, residual pain, and surgical failures—such as Achilles tendon rupture, recurrence, and any need for secondary surgery—were recorded and analyzed to compare complication rates between open and endoscopic methods. The mean time to return to daily activities and sports was recorded and analyzed as mean ± SD.
We specifically selected studies that included highly active populations, such as athletes or young active people, and analyzed differences between subgroups and the general population in terms of recovery speed, outcome measures, and other key findings.
Statistical analyses were conducted using Review Manager 5.4 software (Cochrane Collaboration) to evaluate the changes in AOFAS scores from preoperative (pre-OP) to postoperative (pre-OP). Heterogeneity among the included studies was assessed using the I^2 statistic, where values below 40% indicated low heterogeneity, values between 40% and 75% indicated moderate heterogeneity, and values above 75% indicated substantial heterogeneity. A p-value of less than 0.05 was considered statistically significant.

Subgroup analysis We specifically selected studies that included highly active populations, such as athletes or young active people, and analyzed differences between subgroups and the general population in terms of recovery speed, outcome measures, and other key findings.

Sensitivity analysis None.

Language restriction Only English.

Country(ies) involved Taiwan - Department of Orthopedic Surgery, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City 231016, Taiwan.

Other relevant information 4 pictures, 4703 words

Keywords Insertional Achilles tendinopathy, Haglund's syndrome, Haglund's deformity, Retrocalcaneal bursitis, Endoscopic.

Dissemination plans International size journal (SCI).

Contributions of each author
Author 1 - Po-Yuan Chen - Author 1(Po-Yuan Chen) collected and review the all studies, recorded the data, meta-analysis, drafted the manuscript.
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Author 2 - I-SHIANG TZENG - Author 2 (I-Shiang Tzeng) review all studies to choose the studies and

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Author 4 - Chen-Chie Wang - Corresponding author(Chen-Chie Wang) provided guidance in resolving challenges and revised the manuscript.
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