INPLASY

Systematic Review and Meta-analysis of Efficacy and Safety of Transarterial Embolization for Chronic Refractory Achilles Tendinopathy

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Hsieh, ZY; Chen, JL.

Corresponding author:
ZhaoYu Hsieh

shaq1019@gmail.com

Author Affiliation:
Far Eastern Memorial Hospital.

ADMINISTRATIVE INFORMATION

Support - Review has no funding and no agreed support from an academic institution and is done in authors' own time. Peer review.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202680059

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 August 2026 and was last updated on 30 August 2026.

INTRODUCTION

Review question / Objective Synthesize the current evidence on the effectiveness and safety of TAE for chronic refractory Achilles tendinopathy, including changes in pain, functional outcomes, clinical success, and treatment-related complications.

Rationale Transarterial embolization (TAE) has shown promising results for chronic refractory Achilles tendinopathy. However, the currently available evidence is limited to small-scale studies, and large prospective studies or head-to-head comparative studies are lacking. This systematic review and meta-analysis aims to synthesize the current evidence on the effectiveness and safety of TAE for Achilles tendinopathy, including changes in pain, functional outcomes, clinical success, and treatment-related complications. The review will provide a more precise estimate of treatment effects and help clarify the potential role of TAE in the management of refractory Achilles tendinopathy.

Condition being studied Chronic refractory Achilles tendinopathy characterized by persistent pain and functional impairment despite conservative treatment. This review evaluates the effectiveness and safety of TAE for this condition.

METHODS

Search strategy Published studies will be searched without language restrictions.
The electronic databases will include PubMed, Embase, the Cochrane Library, Web of Science, and Scopus.
To maximize sensitivity, the search strategy will combine Achilles-related terms, including "Achilles tendon," "Achilles tendinopathy," "Achilles tendinitis," and "achillodynia," with embolization-

related terms, including "transarterial embolization," "transcatheter arterial embolization," and "transarterial periarticular embolization."
Controlled vocabulary and free-text terms will be adapted for each database. Terms within each concept will be combined using OR, and the Achilles-related and embolization-related concepts will be combined using AND.
The search strategy is intentionally broader than the clinical eligibility criteria to minimize the risk of missing relevant studies.

Participant or population
(1) Human participants;
(2) Participants aged ≥16 years;
(3) Achilles tendinopathy, including chronic refractory achillodynia consistent with Achilles tendinopathy, as diagnosed by the original study authors based on clinical assessment, with or without supportive imaging;
(4) Chronic or refractory symptoms persisting despite conservative management, as defined by the original study authors. Studies without an explicitly reported symptom duration may remain eligible if the condition is clearly described as chronic, refractory, or therapy-resistant and failure of conservative treatment is documented.

Intervention Transarterial embolization.

Comparator This review does not have any comparator(s) or control(s).

Study designs to be included Randomized or non-randomized clinical studies, prospective or retrospective cohort studies, case series, and uncontrolled before-after studies will be eligible. Studies will not be excluded solely because of small sample size.

Eligibility criteria Inclusion criteria
Original clinical studies that:
(1) Include eligible patients with chronic or refractory Achilles tendinopathy;
(2) Evaluate TAE as a therapeutic intervention;
(3) Report at least one relevant clinical, functional, technical, or safety outcome.
Exclusion criteria
(1) Single case reports;
(2) Reviews, meta-analyses, editorials, commentaries, and other non-original publications;
(3) Study protocols without clinical outcome data;
(4) Conference abstracts without sufficient extractable clinical data;
(5) Animal or non-human studies;
(6) Studies in which Achilles-specific outcomes cannot be separately extracted;
(7) Studies involving combined interventions when outcomes attributable specifically to TAE cannot be separately determined.

Information sources The following electronic databases will be searched:
• PubMed
• Embase
• Cochrane Library
• Web of Science
• Scopus
The reference lists of included studies and relevant review articles will be screened for potentially eligible studies (backward citation searching).
Forward citation searching of included studies will also be performed.
ClinicalTrials.gov will be searched for relevant ongoing, completed, or unpublished studies.

Main outcome(s) Pain assessment (VAS/NRS) at 1 day, 1, 3, 6 and 12 months.

Additional outcome(s) Functional and symptom assessment using the Victorian Institute of Sport Assessment–Achilles (VISA-A) score at approximately 6 months and other validated functional outcome measures where reported; technical success; clinical success; treatment-related complications or adverse events; and re-intervention.

Data management Formal synthesis is planned.

Quality assessment / Risk of bias analysis The NIH Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group will be used for uncontrolled pre-post studies.
If materially different study designs are included, an appropriate design-specific risk-of-bias or quality assessment tool will be applied.
Risk-of-bias assessment will be performed independently by two reviewers, with disagreements resolved by consensus.

Strategy of data synthesis A meta-analysis will be executed if the included data exhibit sufficient homogeneity. Under a REML-based random-effects model, continuous outcomes (e.g., pain and functional scores) will be pooled as mean differences (MD) or standardized mean differences (SMD), while dichotomous data (e.g., adverse events, clinical success) will be synthesized as proportions or risk ratios. Statistical heterogeneity will be evaluated utilizing Cochran's Q test, alongside I^2, and τ^2 statistics, supplemented by sensitivity and subgroup analyses to investigate potential variability. Should quantitative synthesis

prove unfeasible, the results will be detailed through a structured narrative synthesis.

Subgroup analysis No formal subgroup meta-analysis is planned because of the anticipated small number of eligible studies and limited statistical power within potential subgroups. Where relevant, clinical and methodological differences will be described qualitatively.

Sensitivity analysis Sensitivity analyses will be undertaken where feasible.
For pre-post continuous outcomes requiring an assumed within-participant correlation coefficient, the primary analysis will use r = 0.50 and sensitivity analyses will use r = 0.30 and r = 0.70.
Where sufficient studies are available, additional sensitivity analyses may examine the influence of very small studies or studies with important methodological limitations.

Language restriction No language restrictions will be applied. Non-English reports will be translated as necessary for eligibility assessment and data extraction.

Country(ies) involved Taiwan(R.O.C.).

Keywords Achilles Tendinitis; Transarterial Embolization; Efficacy; Safety.

Dissemination plans The findings from the INPLASTY Registry will be disseminated through presentations at national and international scientific meetings and publications in peer-reviewed medical journals. Results may also be shared with participating investigators and relevant healthcare professionals to support clinical practice and future research. All disseminated data will be presented in aggregate form, and no information that could identify individual participants will be disclosed.

Contributions of each author
Author 1 - ZhaoYu Hsieh - Author 1 conceived the study and designed the search protocol, conducted the statistical analysis. and wrote the first draft of the manuscript.
Author 2 - Jian-Ling Chen.
Author 1 and author 2 performed literature screening and data extraction independently. All authors contributed to critical revision and final approval of the submitted version.
Email: shaq1019@gmail.com