

INPLASY PROTOCOL

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interest.

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

INTRODUCTION

Review question / Objective: The purpose of this study was to systematically (1) summarize the specific technique of suture tape augmentation and (2) evaluate the clinical outcomes after anterior cruciate ligament reconstruction with suture tape augmentation.

Suture tape augmentation, a novel application of synthetic materials in anterior cruciate ligament reconstruction: a systematic review

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Review question / Objective: The purpose of this study was to systematically (1) summarize the specific technique of suture tape augmentation and (2) evaluate the clinical outcomes after anterior cruciate ligament reconstruction with suture tape augmentation.

Condition being studied: Suture tape is a common synthetic material in the repairing surgery of soft tissue. Recently, suture tape augmentation technique has been described as a novel way to improve the mechanical property of grafts in the anterior cruciate ligament reconstruction. However, the clinical outcomes of anterior cruciate ligament reconstruction using suture tape-augmented grafts have not been clarified.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 31 October 2022 and was last updated on 31 October 2022 (registration number INPLASY2022100125).

Rationale: A electronic search of PubMed and Embase databases with a manual search of Google Scholar was performed to identify studies that reported the clinical outcomes of anterior cruciate ligament reconstruction with suture tape augmentation. Each included study was abstracted regarding the study features, patient data, surgical information, and outcome measures.

Condition being studied: Suture tape is a common synthetic material in the repairing surgery of soft tissue. Recently, suture tape augmentation technique has been described as a novel way to improve the mechanical property of grafts in the anterior cruciate ligament reconstruction. However, the clinical outcomes of anterior cruciate ligament reconstruction using suture tape-augmented grafts have not been clarified.

METHODS

Search strategy: Search strategy for PubMed database:

1. "anterior cruciate ligament"[MeSHTerms]
2. "anterior"[All Fields]
3. "cruciate"[All Fields]
4. "ligament"[All Fields]
5. 2 AND 3 AND 4
6. "anterior cruciate ligament"[All Fields]
7. "acl"[All Fields]
8. 1 OR 5 OR 6 OR 7
9. "tape"[All Fields]
10. "augment"[All Fields]
11. "augmentation"[All Fields]
12. "augmentations"[All Fields]
13. "augmented"[All Fields]
14. "augmenting"[All Fields]
15. "augments"[All Fields]
16. 10 OR 11 OR 12 OR 13 OR 14 OR 15
17. "reinforce"[All Fields]
18. "reinforced"[All Fields]
19. "reinforcement"[All Fields]
20. "reinforcements"[All Fields]
21. "reinforcer"[All Fields]
22. "reinforcer's"[All Fields]
23. "reinforcers"[All Fields]
24. "reinforces"[All Fields]
25. "reinforcing"[All Fields]
26. 17 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24 OR 25
27. "internal"[All Fields]
28. "internally"[All Fields]
29. "internals"[All Fields]
30. 27 OR 28 OR 29
31. "brace's"[All Fields]
32. "braced"[All Fields]
33. "braces"[MeSH Terms]
34. "braces"[All Fields]
35. "brace"[All Fields]
36. "bracing"[All Fields]
37. 31 OR 32 OR 33 OR 34 OR 35 OR 36

38. 30 AND 37
39. 9 OR 16 OR 26 OR 38
40. 8 AND 39

Search strategy for Embase database:

1. 'anterior cruciate ligament'/exp
2. 'anterior cruciate ligament'
3. anterior
4. cruciate
5. 'ligament'/exp
6. ligament
7. 5 OR 6
8. 3 AND 4 AND 7
9. acl
10. 1 OR 2 OR 8 OR 9
11. tape
12. augment
13. reinforce
14. 'internal brace'
15. internal
16. 'brace'/exp
17. brace
18. 16 OR 17
19. 15 AND 18
20. 11 OR 12 OR 13 OR 14 OR 19
21. 10 AND 20.

Participant or population: Anterior cruciate ligament injury patients.

Intervention: anterior cruciate ligament reconstruction using suture tape-augmented grafts.

Comparator: Anterior cruciate ligament reconstruction with or without suture tape augmentation.

Study designs to be included: systematic review (level 4).

Eligibility criteria: Inclusion criteria: (1) studies reporting clinical outcomes of suture tape-augmented auto- or allografts for ACL reconstructions; (2) studies with an adequate description of the construct of augmented grafts; (3) level of evidence, 1-4; (4) English-language articles; (5) studies without limits placed on the date of publication; (6) studies published online or in print in a peer-reviewed journal. Exclusion criteria: (1) studies unrelated to the suture tape; (2) studies with the suture tape used for partial ACL injuries; (3) studies with the suture tape used for ACL

repairs; (4) studies with the suture tape used for other knee ligaments; (5) studies with other artificial synthetic devices used for ACL reconstructions; (6) biomechanical studies, reviews, case reports, or technical notes.

Information sources: An electronic search of PubMed and Embase databases was conducted on September 12, 2022. A manual search of Google Scholar was then performed to identify studies not indexed by the Web of Science.

Main outcome(s): surgical information, subjective scores, objective knee laxity, return to sports, graft failures, and other complications.

Additional outcome(s): None.

Data management: Each finally included study was abstracted regarding the study features, patient data, surgical information, and outcome measures. Two authors independently extracted the original data, and the final decision on the disagreement was made by a third senior author. Study features consisted of author name, publication year, journal, study design, level of evidence, and methodological quality. Patient data comprised number of cases, sex, age, length of follow-up, and meniscal status. Surgical information was extracted from the specific descriptions in the original studies, including graft details (choice, construct, diameter, and fixation), tape details (indication, product, and fixation), and concomitant procedures. For outcome measures, all subjective and objective results including pain and function scores, knee laxity measurements, return to sports, graft failures, and other complications were documented.

Quality assessment / Risk of bias analysis: The methodologic quality of each included study was assessed with the Methodological Index for Non-Randomized Studies (MINORS). The items in the MINORS criteria for non-randomized studies were scored as 0 (not reported), 1 (reported but inadequate), or 2 (reported and adequate). For comparative studies,

the ideal MINORS score was 24, and a study was considered at low risk of bias when it scored 21-23 and at high risk of bias when it scored ≤ 20 . For non-comparative studies, corresponding thresholds were 16, 13-15, and ≤ 12 . The MINORS score of each study was calculated independently by two authors. Any disagreement was resolved by discussion until a consensus was reached.

Strategy of data synthesis: Descriptive statistics were used to report study characteristics, patient data, surgical information, and outcome measures. Comparison analysis between pre- and postoperative conditions and between patients with and without suture tape augmentation was recorded.

Subgroup analysis: None.

Sensitivity analysis: None.

Language restriction: English-language article.

Country(ies) involved: China.

Other relevant information: None.

Keywords: anterior cruciate ligament; suture tape; synthetic materials; augmentation; outcomes.

Dissemination plans: None.

Contributions of each author:

Author 1 - Tong Zheng - Author 1 conducted the descriptive statistics and drafted the manuscript.

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