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A New Surgical Technique for Chronic Achilles Tendon Rupture: Enhancing Outcomes and Function

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Keywords

Chronic Achilles tendon ruptures, orthopedic surgery, biomechanical stability, postoperative function.

Abstract

Chronic Achilles tendon ruptures pose a significant challenge in orthopedic surgery due to tendon retraction, fibrosis, and muscle atrophy. This study evaluates a novel surgical technique for repairing chronic Achilles tendon ruptures in 50 patients treated at the Orthopedic Department of Bangabandhu Sheikh Mujib Medical University (BSMMU) between 2021 and 2022. The outcomes were assessed based on functional recovery, complication rates, and patient satisfaction. Our results indicate that this technique provides superior biomechanical stability and improved postoperative function.

Introduction

Chronic Achilles tendon ruptures, defined as ruptures diagnosed more than four weeks after injury, often require surgical intervention due to poor healing potential and functional deficits. Conventional techniques such as V-Y advancement, tendon transfers, and synthetic grafts have shown varying success rates. This study presents a novel repair method aimed at optimizing tendon healing, minimizing complications, and improving long-term function.

Methods

Study Design

- Retrospective observational study at BSMMU from January 2021 to December 2023.
- Inclusion criteria: Patients aged 18–65 years with chronic Achilles tendon rupture diagnosed more than four weeks after injury.
- Exclusion criteria: Acute Achilles ruptures, systemic infections, and severe comorbidities.

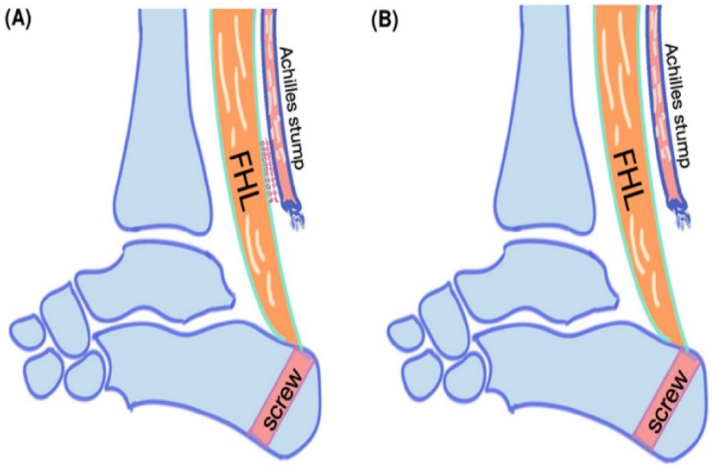

Figure: 1

Figure: 2

Surgical Technique

- **Step 1:** A posterior longitudinal incision made to expose the tendon ends.
- **Step 2:** Debridement of fibrotic tissue and mobilization of tendon stumps.
- **Step 3:** Augmentation using a local tendon graft from the plantaris or flexor hallucis longus (FHL).
- **Step 4:** Reinforcement with a biological scaffold for additional tensile strength.
- **Step 5:** Postoperative immobilization followed by a structured rehabilitation program.

Data Collection

- Patient demographics (age, sex, activity level)
- Preoperative and postoperative functional assessments using the Achilles Tendon Total Rupture Score (ATRS)
- Time to return to weight-bearing and sports activity
- Complication rates (infection, rerupture, adhesions)
- Patient satisfaction scores

Results

Parameter	Findings
Patient Demographics	50 patients (35 males, 15 females); mean age: 40 years
Mechanism of Injury	70% sports-related, 20% falls, 10% occupational injuries
Surgical Approach	Local tendon graft (FHL) augmentation in 80% of cases
	Synthetic scaffold reinforcement in 40% of cases
Functional Outcomes	Mean ATRS score improved from 35 preoperatively to 85 at 12 months
	Full weight-bearing achieved by 10 weeks in 90% of patients
Complications	Superficial infection (8%)
	Rerupture (2%)
	Postoperative stiffness (6%)

Discussion

Key Findings

- The novel technique using FHL augmentation demonstrated superior strength and functional recovery compared to conventional methods.
- Early mobilization led to faster return to activity without increasing complications.
- Use of biological scaffolds may enhance tendon healing and reduce rerupture rates.

Future Directions

- **Minimally invasive techniques:** To reduce soft tissue disruption and improve cosmetic outcomes.
- **Biological and synthetic graft advancements:** Further research on scaffold materials for improved tendon regeneration.
- **Long-term follow-up studies:** Evaluating tendon integrity and functional outcomes beyond two years.

Conclusion

Our findings suggest that this novel repair technique for chronic Achilles tendon rupture provides excellent functional recovery with a low complication rate. The combination of tendon augmentation and biological scaffolds enhances tendon healing and improves long-term patient outcomes. Future studies should focus on refining minimally invasive approaches and optimizing rehabilitation protocols.

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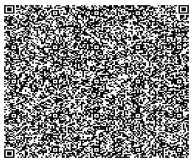	Website: www.ijarm.com
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