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The Novel Surgical Technique for Patellar Tendon Reconstruction with Triple Graft Cerclage in Neglected Patellar Tendon Tear



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Conflicts of interest

- Nothing to disclosure



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Introduction



- Neglected patellar tendon injuries are rare but present significant challenges due to fibrotic scarring, native tendon degeneration and quadriceps muscle atrophy.
- Various surgical techniques and graft choices for the patellar tendon reconstruction have been described. The ideal technique remains debatable
- The most common method is the horizontal trans-osseous tunnel in the patella for the graft passage.
 - Increased risk of the patellar complications e.g. iatrogenic fracture, surface penetration^(1,2)



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Introduction



- This study describes a novel surgical technique for patellar tendon reconstruction in a patient with a neglected patellar tendon injury using the triple autograft cerclage without the bone tunnel in the patella
 - To avoid the patellar complication
 - To offer the stable construct with the cerclage concept
 - Comparable outcome with other surgical techniques



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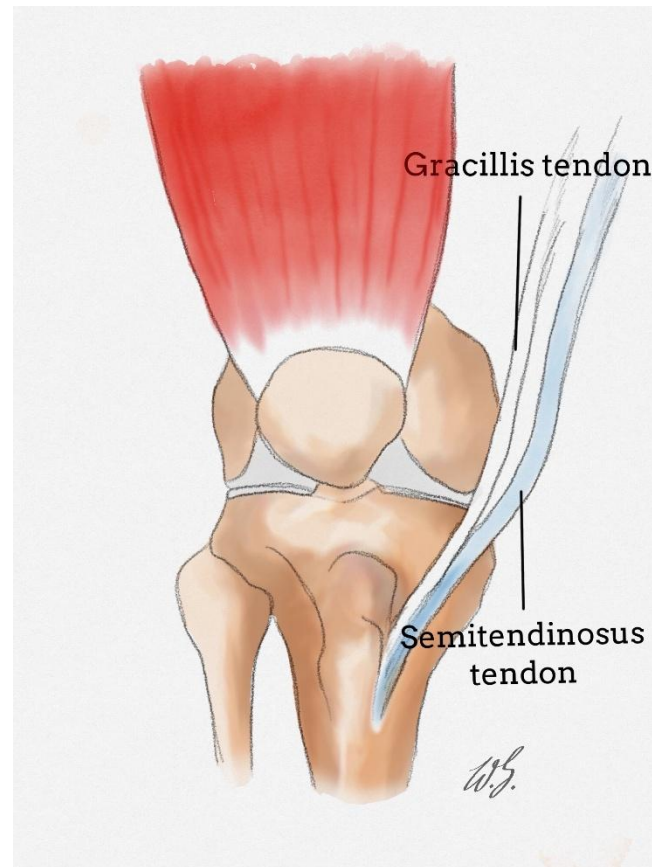
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Case information



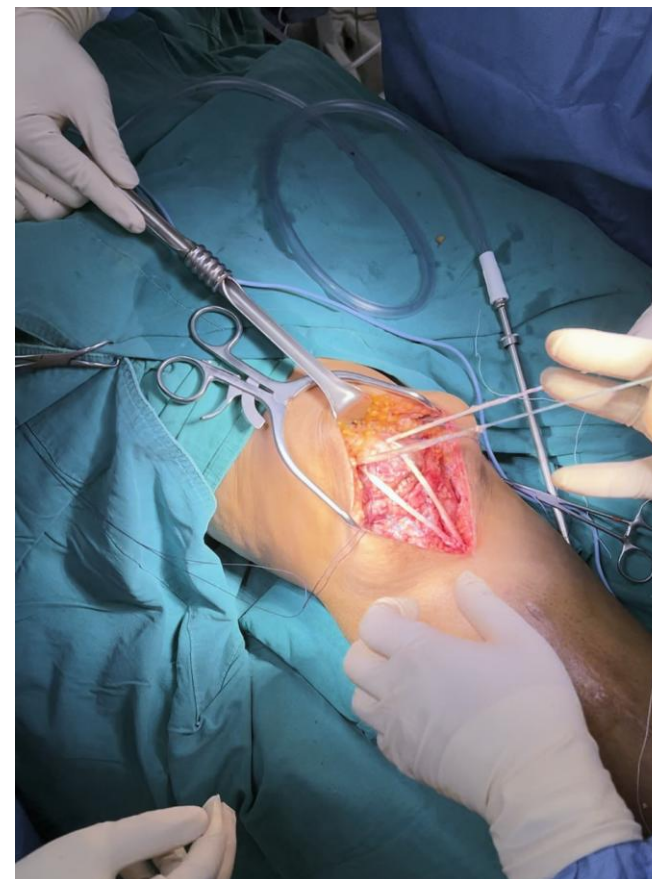
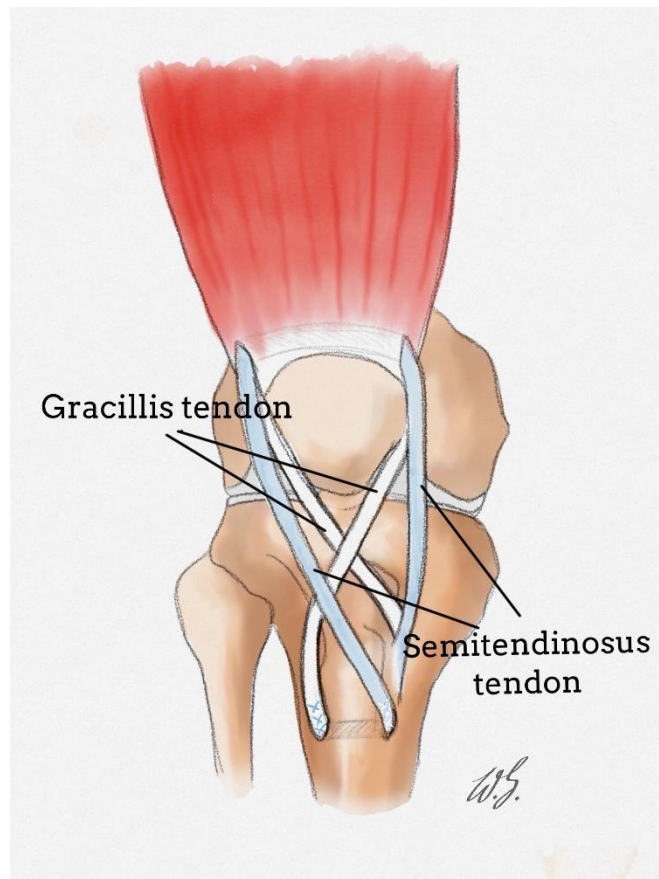
- A 56-year-old female presented with a neglected patellar tendon rupture, 1-year following wide excision of a tumor at her right knee. The patient reported an inability to extend her knee actively, intermittent pain and difficulty walking long distance.
- Plain radiographs demonstrated the superior migration of the patella (patella alta).
- MRI revealed a complete rupture of the patellar tendon at the patellar insertion, with proximal migration and buckling of the quadriceps tendon.

Patellar Tendon Reconstruction with Triple Graft Cerclage: Surgical Technique



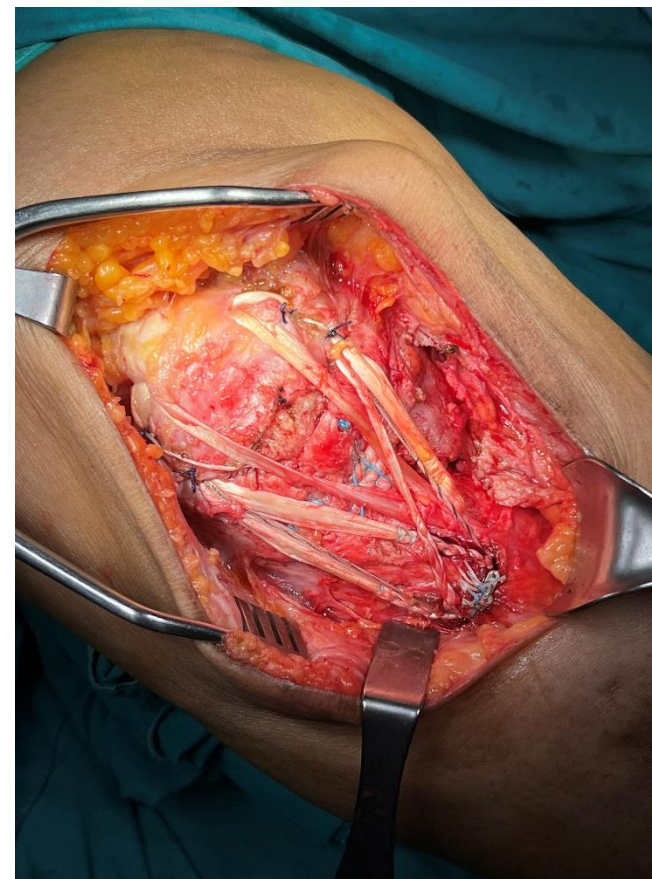
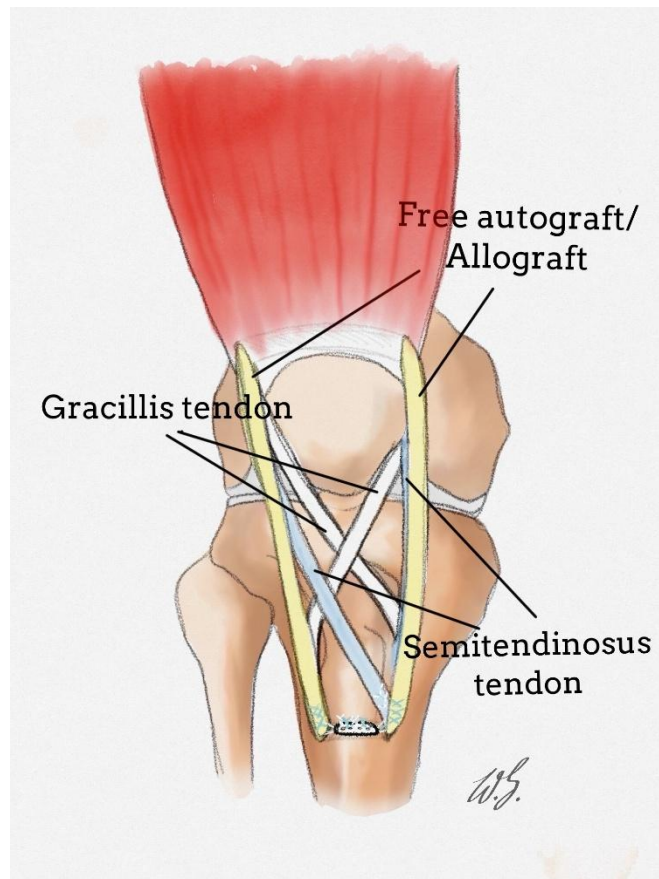
- The **gracilis** and **semitendinosus** tendons were harvested while preserving the tibial insertion.
- The open-loop tendon stripper was utilized to obtain the full length of each tendon.
- After meticulous removal of the surrounding muscle fibers, the free ends of the tendons were sutured for graft configuration.

Patellar Tendon Reconstruction with Triple Graft Cerclage: Surgical Technique



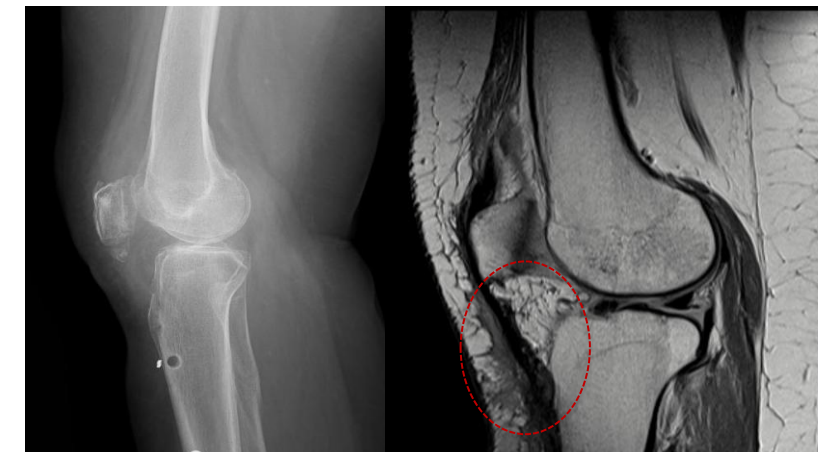
- A transverse tunnel was created using a wire passer through the quadriceps tendon just superior to the patella.
- The **gracilis** and **semitendinosus** grafts were passed through this tunnel in opposite directions to each other.
- A horizontal bone tunnel was drilled at the tibial tuberosity.
- The tendon grafts were then sequentially looped through the tibial tunnel in a figure-of-eight configuration to achieve secure fixation and force distribution.

Patellar Tendon Reconstruction with Triple Graft Cerclage: Surgical Technique



- A free autograft or allograft was additionally passed through the quadriceps tendon and tibial tunnel in a cerclage configuration.
- Intra-operative fluoroscopy was utilized to confirm the appropriate position of the patella prior to final fixation.
- All suture limbs from the tendon grafts were tensioned and secured using a cortical button placed on the anterior aspect of the tibial tubercle, with the knee maintained at 30 degrees of flexion during fixation.

Postoperative outcome



- The locked hinged knee brace in full extension was applied for 6 weeks with progressive weight bearing ambulation. At 6 weeks, gradually wean off the brace, range of motion exercise. At 2 months, stationary cycling was initiated, followed by a strengthening exercise at 3 months.
- By 6 months postoperatively, the patient had regained full ROM without extension lag. She was able to ascend and descend stairs and performed the single-leg stance without difficulty.
- Postoperative MRI confirmed the continuity of the reconstructed patellar tendon.

Discussion



- Chronic patellar tendon rupture is rare which reported after the neglect, native treatment or missed injury which is a difficult challenge.⁽³⁾
- Various surgical techniques of reconstruction have been published with several graft choices, construct configuration, fixation implants, augmentation and additional procedures.⁽⁴⁾
- The most common surgical technique is the horizontal bone tunnel in the patella to secure the graft within the bone.
- Anatomical studies demonstrated that the average patellar thickness in Asian population ranges from 20 to 22 mm.⁽⁵⁾ The creation of a bone tunnel within the patella may significantly increase the risk of the iatrogenic patella fracture, particularly in individuals with thinner patella.



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Discussion



- We propose that this surgical technique offers several advantages.
- This cerclage configuration helps avoid the patellar complication by transmitting the tensile load from the patella directly to the tibial tubercle, minimizing the stress on the patellar bone.
- Preservation of the native tibial insertion of the gracilis and semitendinosus tendons appears to maintain their vascular supply, which is critical for biological healing, particularly in chronic injury.⁽⁶⁾
- This technique is also applicable in cases of neglected idiopathic patellar tendon rupture following patellar resurfacing or total knee arthroplasty.



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Conclusion



- This demonstrates a successful outcome using a novel surgical technique for patellar tendon reconstruction employing triple graft cerclage in a patient with a neglected patellar tendon injury.
- This technique effectively avoids the transpatellar tunnel, thereby reducing the risk of iatrogenic patellar fracture particularly in populations with relatively thin patella.
- This technique may provide a valuable alternative for managing similar cases, offering a potential for excellent functional recovery and graft integrity.



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