

## Allograft Reconstruction for Unsalvageable and Recurrent Tears of Both Peroneal Tendons

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**Introduction/Purpose:** Surgical reconstruction for the complete loss of both peroneal tendons is challenging, with no established standard. This is true both for concomitant tears that extend superior to the superior peroneal retinaculum, and for nonfunctioning, unsalvageable peroneal tendons after prior repair or reconstruction, which have recurrent tears, tendon degeneration, scarring, and stretching. These cases have in common that there is no option for retention of the native tendons. Allograft reconstruction can bridge long defects, reestablishing the insertion of the proximal musculo-tendinous unit to the lateral foot. However, there are limited published data on allograft reconstruction, and series are small and heterogenous. This study reports the results of allograft reconstruction at a mean of 4.1 years follow-up (range 1.5-7.3 years).

**Methods:** A retrospective study reviewed patients who had allograft reconstruction for unsalvageable or recurrent tears of both the peroneus brevis and peroneus longus tendons. In all cases, the unsalvageable segments of both peroneal tendons were excised. A hamstring allograft tendon with width of >6mm was pre-stretched, then anchored to the proximal 5th metatarsal, and also sutured to itself and the adjacent brevis stump, if viable. The peroneal retinaculae were reconstructed over the allograft tendon. The peroneal muscle-proximal tendon units were extensively stretched inferiorly using suture loops in the tendons. They were maximally tensioned and anastomosed to the maximally tensioned allograft while holding the hindfoot in maximum eversion. Of the 14 eligible patients, 13 had minimum one-year follow-up and constituted the study population. Mean age was 50.7 years (range 26.3-68.6 years). Ten patients had at least one prior peroneal tendon surgery; four patients had at least two.

**Results:** At mean follow-up of 4.1-years, seven patients were 'very satisfied,' one 'satisfied,' one 'neutral,' and two 'dissatisfied.' Ten stated they would have the procedure again, one would not. Two could not be reached to answer these questions. Visual analogue scale pain score decreased from 4.6 to 3.4 ( $p=0.150$ ), ankle osteoarthritis scale (AOS) pain subscale decreased from 36.2 to 13.8 ( $p=0.013$ ), AOS disability subscale decreased from 42.8 to 21.9 ( $p=0.032$ ), and AOS total score decreased from 39.5 to 17.8 ( $p=0.014$ ). No statistical change in SF-36 physical function score ( $p=0.547$ ) or PROMIS physical function score ( $p=0.580$ ) was detected. At last examination, 12 of 13 patients had active eversion and a palpable, tensioned graft. The patient without active eversion underwent triple arthrodesis; no other patient had additional peroneal or hindfoot surgery.

**Conclusion:** Allograft interposition is effective to reconstruct unsalvageable concomitant tears of both peroneal tendons as well as the most difficult revision cases of nonfunctioning, unsalvageable peroneal tendons after prior repair or reconstruction, which have recurrent tears, tendon degeneration, scarring, and stretching. There is a high rate of restoration of peroneal function, a reasonable rate of patient satisfaction, and statistically significant improvements in ankle-specific patient-reported outcomes.