

PATIENT CHARACTERISTICS AND THEIR IMPACT ON RECOVERY AFTER ACUTE ACHILLES TENDON RUPTURE

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i R-aulan, Sahlgrenska Universitetssjukhuset Mölndal, fredagen den 11 april, klockan 13.00

av

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Avhandlingen baseras på följande delarbeten

- I. **Larsson E, Brorsson A, Carling M, Johansson C, Carmont MR, Nilsson Helander K Sex differences in patients' recovery following an acute Achilles tendon rupture - a large cohort study** *BMC Musculoskelet Disord.* 2022;23(1). doi: 0.1186/s12891-022-05875-9
- II. **Larsson E, LeGreves A, Brorsson A, Eliasson P, Johansson C, Carmont MR, Nilsson Helander K Fear of reinjury after acute Achilles tendon rupture is related to poorer recovery and lower physical activity postinjury** *J. Exp. Orthop.* 2024;11(7). doi: <https://doi.org/10.1002/jeo2.70077>
- III. **Larsson E, Brandt Knutsson S, Brorsson A, Johansson C, Nilsson Helander K Establishment of the Patient Acceptable Symptom State (PASS) for the Achilles Tendon Total Rupture Score in a Swedish Population** *Orthop J. Sports Med.* 2024;12(7). doi:10.1177/23259671241253280
- IV. **Larsson E, Nilsson Helander K, Falkheden Henning L, Heiskanen M, Carmont MR, Grävare Silbernagel K, Brorsson A Achilles tendon resting angle is able to detect deficits after an Achilles tendon rupture, but it is not a surrogate for direct measurements of tendon elongation, function or symptoms** *Knee Surg Sports Traumatol Arthrosc.* 2022;30(12):4250-4257. doi: 10.1007/s00167-022-07142-9
- V. **Larsson E, Brorsson A, Eliasson P, Szaro P, Nilsson Helander K Using tendon gap as a decision-making tool provides comparable function regardless of surgical or non-surgical treatment for an acute Achilles tendon rupture** *Manuscript*

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PATIENT CHARACTERISTICS AND THEIR IMPACT ON RECOVERY AFTER ACUTE ACHILLES TENDON RUPTURE

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Abstract

The incidence of acute Achilles tendon rupture has increased in the Swedish population. Several randomised controlled trials (RCTs) have been conducted to compare surgical and non-surgical treatment. The results demonstrate no significant differences in self-reported or functional outcomes between these treatment modalities. Notwithstanding the robust results of these RCTs, a unified approach to personalise patient treatment remains elusive. To support the development of individualised treatment plans, five studies have been performed to address this issue.

Study I investigated whether there were differences between men and women in self-reported outcomes. A total of 564 patients were included in the study, of which 129 (23%) were women. This study revealed that women self-reported significantly worse outcomes than men 1 to 6 years after injury. **Study II** evaluated the extent to which patients refrained from physical activity due to fear of re-injury to their Achilles tendon. In this study, 550 patients were included, of which 308 (56%) reported fear of re-injury. These patients also reported poorer self-reported outcomes compared to those who did not report a fear of re-injury. **Study III** aimed to establish the Patient Acceptable Symptom State (PASS) for the ATRS. The study comprised 316 participants; their responses to the anchor question and ATRS yielded a PASS value of 75 points for the Swedish Achilles tendon Total Rupture Score (ATRS). **Study IV** examined how the Achilles Tendon Resting Angle (ATRA) correlated with ultrasound (US) measurements at 6 and 12 months after an acute Achilles tendon rupture. Moreover, the correlations between the ATRA and other clinical measurements were evaluated. The study included 60 patients. The results demonstrated a significant correlation between relative ATRA and tendon elongation and between relative ATRA and heel-rise height. **Study V** investigated whether the distance between the tendon ends after an acute Achilles tendon rupture - as a criterion for treatment selection - could influence functional and self-reported outcomes. In the patient group where the tendon gap (measured by US) was < 5 mm, non-surgical treatment was employed. Conversely, patients were treated surgically if the tendon gap was > 5 mm. A total of 128 patients were included in the study, with 87 (68%) treated surgically and 41 (32%) treated non-surgically. One patient in each treatment modality suffered from a re-rupture. The functional and self-reported outcomes showed no statistically significant differences between the two treatment groups.

In conclusion, this thesis shows that clinicians should be aware of the inferior outcome in female patients and patients who suffer from fear of re-injury following an acute Achilles tendon rupture. Moreover, establishing the PASS for the Swedish ATRS may facilitate improved clinical interpretation of ATRS scores. The correlation between ATRA and tendon elongation, evaluated with US, supports using ATRA to detect tendon elongation in the clinical setting. Furthermore, this thesis has contributed to our understanding of the tendon gap and its clinical relevance in selecting appropriate treatment following acute Achilles tendon rupture.

Keywords: Acute Achilles tendon rupture, Sex-differences, Fear of re-injury, Recovery, ATRS, PASS, ATRA, Ultrasound, Treatment.

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