

## Infection and Immune reaction after Achilles repair: A systematic review

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**Introduction:** Achilles tendon rupture is among the most common tendinous injuries in athletes. As with any surgical procedure, Achilles tendon repairs have an inherent risk of infection. Surgeries in and around the ankle have been reported to have a higher incidence of infection than other orthopedic surgical sites, and the Achilles tendon has been reported to be infected with unique microorganisms differing from other orthopedic surgical sites. The purpose of this study is to systematically review the literature regarding infections following Achilles tendon reconstruction and identify common pathogens, risk factors, and methods associated with this outcome.

**Methods:** An electronic review was conducted via PubMed and Cochrane search. Primary factors assessed include causative microorganism, time to infection, treatment, foreign body identified, and risk factors. Because of the small size of studies and the lack of reporting on treatment information and causative agents, case reports were included to give detailed information on the clinical course and infectious agents.

**Results:** A total of 34 articles meeting inclusion criteria were included. This included 23 clinical studies, 10 case studies, and 1 systematic review. Of the 34 articles, 7 clinical studies mentioned time course, causative agent, and/or treatment of infection whereas 9 of 10 case reports included this information. *Staphylococcus aureus*, coagulase negative *Staphylococci*, and *Pseudomonas aeruginosa* were the most common infectious agents making up 32.97%, 19.78%, and 13.19% of cases, respectively. The greatest risk factors were open wounds prior to surgery ( $P < 0.001$ ), obesity ( $P < 0.0001$ ), and age ( $P = 0.03$ ). The time to infection spanned between 10 days up to 6 months, with most infections occurring within the first 8 weeks. Additionally, in the 6 studies comparing open vs minimally invasive repair, two studies found that open repair had a statistically significant increase in increase in post-operative complications including infections, while four studies found no statistically significant increase.

**Discussion:** *Staphylococcus aureus*, coagulase negative *Staphylococci*, and *Pseudomonas aeruginosa* were the most common infectious organisms, constituting 64.4% of cultured microorganisms. The differences in infection rate when compared with surgical repair methods may be due to heterogeneity of studies in regards to population and sample sizes. A limitation of the present study is that few identified studies included data related to infectious organisms, treatment, and course of infection for each case thus making it challenging to draw satisfactory conclusions without the inclusion of case reports, which were more likely to give detailed descriptions of these factors.

**Significance/Clinical Relevance:** Infections are a rare but serious complication of Achilles tendon repair. This study helps to identify common causative agents and risk factors as well as the time course to infection and infection recovery in the patients who experience this complication.

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