The Achilles heel of adults and children
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Citation for published version (APA):

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SECTION I: TERMINOLOGY AND PATHOLOGY

A consentient terminology of the Achilles tendon region is challenging: various matters impede this process: many eponyms are in use, terms are used interchangeably, numerous are closely related and definitions are susceptible to personal interpretation. Difficulties further extend due to the continuous change of preference influenced by both history and current trends. Multiple groups have tried to address these issues, however to less avail. Recently, a more evidence and anatomy based use of definitions was proposed, in addition to use eponyms as least as possible. The second chapter meticulously outlines the frequently seen pathologies and often used eponyms in the area of pre-Achilles fat pad (Kager triangle) to set out the definitions throughout this work. It remains an item of discussion whether the use of eponyms is favorable or not. If the use of the eponymous nomenclature is put aside and replaced by a uniform terminology based on a combination of anatomic location, symptoms, clinical findings, and/or histopathology, daily medical practice is less confusing. As the medical society is based and proud of its (eponymous) predecessors and traditions, the (debate on) eponymous nomenclature may also have become a lasting tradition.

SECTION II: IMAGING

The second section of this thesis focuses on the advancement of conventional radiography. The third chapter reports on a new imaging technique, the PIM-view, which may be more accurate in the detection of posterior osseous ankle impingement. Due to its anatomic relation posterior ankle impingement is an important differential diagnosis of Achilles tendon pathologies. Patients often complain of pain at or near the Achilles tendon, a meticulous physical examination combined with specific diagnostic imaging can differentiate between pure Achilles tendon disorders and posterior ankle impingement. This new imaging technique was evaluated in a prospective comparative study between the original Lat-view and the new PIM-view. The results show the significant diagnostic superiority of the PIM-view compared to the Lat-view in the detection of an os trigonum. Although the current advancements in CT/MRI imaging techniques are very important and provide new insights, the disadvantages should not go unnoticed: the radiation exposure, duration of investigation and financial burden. In addition, these advanced techniques may not be necessary to provide proper care to our patients. However conventional imaging is slowly losing ground on advanced techniques in modern medicine as the availability of advanced imaging is growing globally its use is equally expanding. The most important disadvantages of increased radiation and its substantial costs have decreased substantially over the years; more often MR is used and compared to recent history the financial burden...
has decreased evidently. This may limit the use of the PIM-view over time; however as the costs remain distinctively higher for advanced imaging, improved conventional imaging still has its place in current medicine. The second study of the diagnostic section (chapter 4) also discussed the use of conventional radiography. Instead of the common aim of conventional imaging; visualization of osseous structures, this was the report of soft tissue imaging. It is known that the Lat-view is a reliable method to diagnose retrocalcaneal bursitis. Furthermore, retrocalcaneal bursitis is, in spite of previous treatment, known to reoccur. The aforementioned work studied a group of patients whose ankles were never operated on. Hence it is unknown whether conventional radiography is still reliable after surgery once symptoms reoccur. The fourth chapter reported on the reliability of conventional radiography of the ankle after surgical intervention for retrocalcaneal bursitis. Based on the current study it can be concluded that in case of a clinically suspected retrocalcaneal bursitis in patients who already underwent endoscopic calcaneoplasty for the same pathology, a conventional lateral standing radiograph cannot be used as a reliable diagnostic criterion. Although the current study was performed on subjects who underwent an endoscopic calcaneoplasty, it is also an important finding for other hindfoot pathologies. As the pre-Achilles fat pad is manipulated significantly in open procedures for chronic retrocalcaneal bursitis or any other hindfoot procedure (open or endoscopic), it is expected that these also reveal obliterated radiographs long term postoperatively. This should be studied in forthcoming work. As with the PIM-view, the days of conventional imaging for retrocalcaneal bursitis are counted due to other techniques, however, until these advanced imaging have become more accessible, it is certainly justifiable to use conventional imaging.

SECTION III: THE ACHILLES HEEL IN ADULTS

The third section concerns the treatment of Achilles tendon (related) problems in adults. The use of PRP for midportion Achilles tendinopathy has become a widely studied topic with interesting differences in outcome. The cause for that is unsure, however one important issue is the location of PRP directly after injection. This remains unsure and may be important for the therapeutic effect of the injected substance. The fifth chapter evaluated the feasibility of ultrasound guided PRP injection into and around the Achilles tendon and the spread thereof. The results show it is feasible to inject PRP under ultrasound guidance into the AT as well as in the area between the AT and paratenon. We found evident differences between injection techniques regarding the distribution of PRP after injection. As the current study was done without specific information of the state of the Achilles tendon, the question remains whether the same results are found in Achilles tendons with diagnosed Achilles tendinopathy or other pathology. Another point of interest is the
post-injection protocol: a substantial variance exists between the physicians’ aftercare: some allow patients to bear weight immediately whereas others are more protective by advising partial weight bearing days after injection. A final and important point of discussion regarding PRP treatment is the important variance between study results. The cause is unsure but the results are evident: some show substantial relief of symptoms whereas other studies show none. It may be due to the used injection technique, the post-injection protocol, the subtle difference in content of PRP or the variance of study quality. Despite the difference in effectiveness, all studies report a common result: very few complications. This favours the use of PRP significantly as the approach of “it cannot hurt to try” is considered. Although it should be noted this approach is clearly not evidence based, complications of PRP injections should be studied more intensely, it is a very pragmatic approach and certainly one that patients understand as symptoms of tendinopathy are often longstanding and patients are desperate for a cure.

In the sixth chapter, the treatment of insertional Achilles tendinopathy was studied. Although some studies have provided a general overview of the treatment of insertional Achilles tendinopathy a meticulous systematic comparison has never been made. The purpose of this systematic review was to analyze the effectiveness of different available surgical and/or nonsurgical treatment modalities for insertional Achilles tendinopathy. The most important findings of the systematic review on treatment of IAT are that despite differences in outcome and complication ratio, the patient satisfaction is high in all surgical studies. It was, due variance in outcome measures, not possible to draw conclusions regarding the best surgical option. Shock wave therapy (ESWT) seems effective in patients with non-calcified IAT. Although both eccentric exercises resulted in a decrease in VAS score, full range of motion eccentric exercises show a low patient satisfaction compared to floor level exercises and other conservative treatment modalities. Chapter seven evaluated the surgical treatment of retrocalcaneal bursitis: this systematic review assessed all surgical treatments for chronic retrocalcaneal bursitis. The aim was to provide a clear overview of the best available surgical treatment modality for chronic retrocalcaneal bursitis. Based on the systematic review on operative treatment of retrocalcaneal bursitis the endoscopic technique is a superior compared open procedures. A very important item to provide the right treatment is the terminology and definitions of a certain diagnosis. Symptoms of- and near the Achilles tendon insertion are often alike, leading to confusion on the diagnosis and treatment. How did one come to the diagnosis of insertional Achilles tendinopathy or retrocalcaneal bursitis? What is their definition of IAT? Should it not be retrocalcaneal bursitis? Is it a case of combined pathology? These matters must be clearly defined in the study report. A clear terminology aids in the future treatment, however when performing retrospective studies, such as systematic reviews, this problem remains. For any study on insertional Achilles pathology (insertional tendinopathy or retrocalcaneal
bursitis) a report on the presence of calcifications is essential, because as the outcome of a
treatment could be different in patients with bony pathology compared to a group without
bony pathology. In addition, the diagnostic method to search for calcifications should be
clearly stated as the accuracy per method differs.

SECTION IV: THE ACHILLES HEEL IN CHILDREN

The fourth and final section of the thesis discusses the treatment of Achilles tendon
(related) problems in children. A common pathology is calcaneal apophysitis or Sever’s
disease. It is a topic which is rarely studied despite the fact that it is known to cause a
significant decrease in the quality of life of affected children. The incidence is unsure,
and was never studied specifically. The pathophysiology is unknown, as is the most ef-
effectiveness. Chapter eight reported on the incidence of calcaneal apophysitis in
the Dutch general practitioner’s practice. The incidence of 3.7 per 1000 registered patients
between the age of 6 and 17 years is unexpectedly high and warrants additional research.
The focus should be directed foremost to the treatment of affected paediatric patients.
Currently, only a few studies have evaluated treatment options and there is an absence
of high level of evidence studies. In addition, attention must be given to the underlying
injury mechanism to analyse the pathophysiology of this injury that remains unknown.
Finally, as this was the first study on the incidence of calcaneal apophysitis and the results
may vary over years or between studied populations, it is advisable to repeat this study in
the (near) future. Chapter nine showed the results of the first randomized controlled trial
on the treatment of calcaneal apophysitis. The effectiveness of three often-used regimes
was studied. Treatment with wait and see, a heel raise inlay or physical therapy each
result in a clinical relevant and statistical significant reduction of heel pain due to calcaneal
apophysitis. An important item is the kind of treatment options that have been evaluated:
all are non-invasive options that do not necessarily have to be prescribed and evaluated
by an orthopaedic surgeon. The question arises, should we save children and their parents
from orthopaedic consultation in case of suspected calcaneal apophysitis? Is this a pathol-
ogy that should be treated in the frontline of healthcare, by general practitioners? The
diagnostic roadmap would suggest it certainly could be diagnosed in primary care setting.
The necessity of imaging has been studied extensively leading to the conclusion that imag-
ing is generally not required. The combination of theoretical knowledge and clinical skill
should enable any physician to diagnose calcaneal apophysitis in a child with heel pain.
This paves the way, in combination with the above described effective treatment options
to treat common calcaneal apophysitis in the primary care setting.
REFERENCES


