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MRI in patients with Haglund's deformity and its influence on therapy

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Abstract

Introduction Heel pain is one of the common reasons why patients consult orthopaedic surgeons in an outpatient setting. The dorsal heel pain is often caused by a Haglund's deformity which is an exostosis of the posterior superior calcaneus. It often leads to Haglund's syndrome with calcaneal bursitis and Achilles tendinosis. This study aims to investigate the roll of MRI in diagnosis of Haglund's syndrome and its influence on therapy.

Materials and methods We retrospectively analysed data of 45 patients which clinically and radiologically confirmed Haglund's deformity. Patients were divided into two groups that either did not receive MRI (MRI_0) or received MRI (MRI_1). To evaluate the significance, Fisher´s test was used. A statistical significance was assumed at $p < 0.05$.

Results The average age was 57.0 years. There was no significant difference in therapy comparing the groups MRI_0 and MRI_1. Haglund's syndrome was detected in 86.7% of all patients with Haglund's deformity.

Conclusion MRI does not influence the therapy of patients with Haglund's deformity. Therefore, the resources of this cost-intensive and limited type of investigation should be used elsewhere. In cases of atypical heel pain, the MRI might be useful.

Keywords Haglund's deformity · Haglund's syndrome · Heel pain · MRI

Introduction

Since ancient times the Achilles tendon and the heel have been viewed as a very vulnerable and fragile part of the body. According to Greek Mythology, Paris´ arrow strikes Achilles in his heel, causing his death. Still today, heel pain is something which affects many patients. Studies show that up to 15% of all consultations with foot and ankle joint orthopaedic surgeons take place as a result of heel pain [1]. In principle, we can distinguish between two categories of heel pain: plantar and dorsal [2]. The pain can result from for instance plantar fasciitis, Achilles tendinitis or a calcaneal bursitis. The underlying cause is often an anatomical anomaly, such as Haglund's deformity. This exostosis of the posterior–superior calcaneus was first described in 1927 by the Swedish surgeon and orthopaedist Patrik Haglund, after whom the condition is named. The formation of this bony exostosis leads simultaneously to an increase in soft tissue, which in turn contributes to typical dorsal heel pain [3]. If Haglund's deformity is accompanied by calcaneal bursitis and Achilles tendinosis, it is then referred to as Haglund's syndrome. Since therapy is often a protracted matter, a quick and reliable path to the correct diagnosis is crucial [4]. In addition to clinical examination, imaging techniques such as ultrasound, conventional X-ray and magnet resonance imagining (MRI) are also available. The following study aims to investigate whether the use of MRI, and the additional information it provides, has an influence on the therapy of patients suffering from Haglund´s deformity, and to demonstrate which diagnostic findings can be gathered from a MRI.

Materials and methods

The study was implemented in a retrospective study design. Included in the study were all patients with a clinically and radiologically confirmed case of Haglund´s deformity, treated in our Orthopaedic and Trauma Surgical Practice in the period between 01.01.2016 to 31.12.2017. In total, the data of 45 patients was analysed. 7 patients had to be

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excluded due to the fact that they had undergone previous surgeries. A further 3 patients were excluded due to the fact that the MRI took place only after the third consultation and then obviously only for preoperative planning (Fig. 1). Finally, patients were divided into two groups. One group, who did not receive an MRI scan (MRI_0) and one group who received an MRI scan at the beginning of their therapy (MRI_1). From the practice´s information system (Turbomed, CompuGroup Medical, Koblenz), basic data such as age and sex, as well as data regarding additional examinations and the implemented therapy were analysed. Possible therapies implemented included insoles, braces, anti-inflammatory drugs, steroid injections, shock waves and operations. Finally, the results of the MRIs conducted were more closely analysed. The statistical evaluation of the data was carried out with Office Excel 2003 (Microsoft, USA). To evaluate the significance, Fisher´s test was used. A statistical significance was assumed at $p < 0.05$.

Results

Basic data

The average collective age of the patients was 57.0 years old (18–90). The MRI_0 group had a lower average age at 53.6 years (18–90) than the MRI_1 group, who had an average age of 60.3 years (38–81). Overall, women were more affected than men, representing a percentage of 57.1% (MRI_0: 55.0% vs. MRI_1: 60.0%).

Implemented therapies

Regarding the therapies implemented, it is noteworthy that anti-inflammatory drugs were administered as a basic standard to both groups. Non-invasive, conservative measures, such as the provision of insoles or braces were generally speaking implemented more frequently on group MRI_1. Invasive therapies such as the administration of steroid injections were more frequent in group MRI_0. However, no statistically significant differences in the implemented therapies could be established between the groups MRI_0 and MRI_1. Only one operation was carried out, on a patient from group MRI_1. The findings are represented in Table 1.

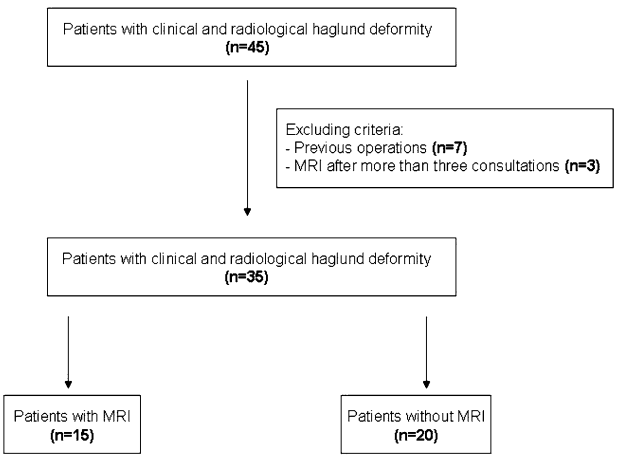

Fig. 1 Flowchart representing the collective patient groups

Additional diagnostic investigation

In the MRI_0 group, generally speaking, an additional ultrasound investigation was carried out more frequently than on group MRI_1. Here also though, there is no significant statistical disparity (Table 2).

MRI results

The analysis of the MRI results shows that of 15 patients in group MRI_1, 13 had accompanying calcaneal bursitis as well as Achilles tendinitis. This means that a total of 86.7% of all patients suffering from Haglund's deformity met the criteria of Haglund´s syndrome. Intra-tendon rupture of the Achilles tendon could be evidenced in 20.0% of the cases (3 out of 15).

Table 1 Comparison of implemented therapies in the groups MRI_0 und MRI_1

	MRI_0 ($n=20$)	MRI_1 ($n=15$)	p values
Insoles	65% ($n=13$)	73.3% ($n=11$)	0.721
Brace	10% ($n=2$)	20% ($n=3$)	0.631
Steroid injections	25% ($n=5$)	13.3% ($n=2$)	0.672
Shock wave	15% ($n=3$)	15% ($n=1$)	0.619
Operation	0% ($n=0$)	15% ($n=1$)	0.429
Anti-inflammatory drugs	100% ($n=20$)	100% ($n=15$)	1.0

Table 2 Comparison of additional diagnostic investigation in the groups MRI_0 und MRI_1

	MRI_0 ($n=20$)	MRI_1 ($n=15$)	p value
Ultrasound	30% ($n=6$)	20% ($n=3$)	0,7

Discussion

In the current literature, many studies concern themselves with diagnosis and treatment of plantar heel pain, therefore the present study considers first and foremost a greater number of cases of patients with dorsal heel pain [5–8]. Studies concerning Haglund´s deformity often only describe a small number of cases [9, 10]. The discrepancy between the number of studies dealing with Haglund´s deformity and the actual number of cases observed in daily clinical practice is noteworthy.

The basic data of our analysis relating to the age and gender correspond to the available literature [3].

The central conclusion of our study showed that the performance of an MRI did not lead to any significant change in the therapy of patients with Haglund´s deformity. At first glance, carrying out an MRI may seem the best way to make a reliable diagnosis. The conventional X-ray is certainly the most widespread type of imaging and additionally it is cost effective and also readily available. Yet, it is true that X-ray does not reveal anything regarding the soft tissues. Kang et al. attempted in the year 2012 to introduce a radiological measurement of Haglund´s deformity. They speculated that there was no correlation between the exostosis and the accompanying tendinitis of the Achilles tendon, as exostoses could also be observed in asymptomatic patients [11]. Other authors have also addressed this question [12]. Because computer tomography (CT) also reveals little regarding soft tissue, apparently only MRI remains. Indeed, the availability of MRI, especially as an outpatient service is continually improving, however patients often have to wait for long periods for appointments. Yet, in the last few years there has been a clear increasing trend in the number of MRI investigations, and correspondingly in the associated costs. Thus this often ill-considered indication is a target of criticism [13]. If we discuss our results against this background, then the heterogeneity of the patient collective must be considered. The age of the patients fluctuates between 18 and 90 years, also further diseases, physical resilience and the activity in sports should vary a lot; these factors influence the indication for performing an MRI as well as the decision for the respective therapy.

The usefulness or necessity of performing an MRI in the case of acute heel pain has correspondingly already been the subject of numerous scientific considerations. However with regard to heel pain, all these studies refer exclusively to plantar heel pain. Nonetheless, they provide interesting results in comparison to the present data.

Fazal et al. in the year 2017 showed that in every fifth case of patients with a clinical presentation of plantar fasciitis, the MRI showed no abnormalities. The remaining examinations confirmed the suspected diagnoses [14]. Chimutengwende-Gordon et al. demonstrated that an MRI is only beneficial in atypical cases of plantar heel pain [5].

This study considers for the first time exclusively symptomatic patients and analyses the comparison of the two groups, MRI_0 and MRI_1. Similarly to the results of the studies concerning plantar heel pain, no statistically significant difference in the conservative and operative therapies between the two groups could be demonstrated. Especially interesting is the closer analysis of the MRI results. These reveal that in 86.7% of cases, the MRI shows calcaneal bursitis as well as Achilles tendinitis. Correspondingly it can be assumed that 9 out of 10 patients with Haglund´s deformity have also developed so-called Haglund´s syndrome. This is important if surgical therapy should be considered. In the case of skip lesions of Achilles tendon, surgical intervention must go beyond resection of the bursa and exostosis and involve the tendon itself.

It can be anticipated that the value in the MRI_0 group is similar, calling into question the added benefit of an MRI, when one can assume that patients with symptomatic Haglund´s deformity also have accompanying bursitis and tendinitis.

This observation and it´s lack of effect on therapy leads to the conclusion that the performance of an MRI on patients with symptomatic Haglund´s deformity is often unnecessary. As an alternative to MRI, the ultrasound is worth examining, which offers an alternative within the diagnostic framework [15]. Our data demonstrate that in the group MRI_0, where generally speaking more ultrasound examinations were carried out, yet no statistical significance was demonstrated. Even though surgical treatment of patients with dorsal heel pain is repeatedly described, this played no role in our patient group [16–18].

The present study has some limitations. The heterogeneity of the patient collective has already been discussed. Also, the number of cases in both groups does not exclude statistical uncertainties. Furthermore, we did not perform a power analysis. The most important limitation is certainly the retrospective design. Accordingly, no statements can be made about the indications for performing MRI or the respective therapy. Although it could be possible that MRI was only performed to confirm the diagnosis and that the therapy was determined before MRI was performed, a description of the clinical course and the outcome of the patients is currently not possible and must be part of further studies.

Conclusion

The clinical relevance of the present study is based on its new information about the diagnostic and therapy of patients with symptomatic Haglund's deformity. The performance of

an MRI plays no significant role in influencing the therapy regime in these patients. Accordingly, this cost-intensive type of investigation should be avoided in these patients, so that limited resources can be put to use elsewhere.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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