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Gluteal-related lateral hip pain

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ABSTRACT

INTRODUCTION: Lateral hip pain (LHP) due to tendon pathologies of insertion of the M. gluteus medius and minimus at the greater trochanter are often misdiagnosed and may lead to unrecognised disability. The purpose of this study was to evaluate pain and patient-reported outcomes in patients presenting with LHP in the context of a publicly financed healthcare system.

METHODS: Data were collected from September 2017 to November 2020 at a regional teaching hospital. Inclusion criteria were clinical and MRI-verified hip abductor tendon pathology. Baseline testing included pain scoring (numerical rating scale, NRS), and the following patient-reported outcome scores: Copenhagen Hip and Groin Outcome Score (HAGOS), Oxford Hip Score (OHS) and EuroQol-Visual Analogue Scale (EQ-VAS).

RESULTS: A total of 151 patients (94% women) with a median age of 55 years were included. The mean LHP (NRS 0-10) at rest, during activity and worst pain at any given time was 4, 7 and 9, respectively. The mean patient-reported outcome scores were HAGOS: pain 42.9, symptoms 49.8, activities of daily living 42.2, sport/recreation 28.1, participation in physical activities 25, quality of life 27.8; OHS 24; EQ-VAS 59.6.

CONCLUSIONS: We found that patients with hip abductor tendon pathology display poor patient-reported outcomes comparable to those of patients suffering from severe hip osteoarthrosis. Further research into this patient group is warranted. The results are based on a heterogeneous study population in terms of variety of hip abductor tendon pathology and comorbidities and need to be interpreted as such.

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Lateral hip pain (LHP) caused by hip abductor (m. gluteus medius and minimus) tendon pathologies has received growing attention during the past two decades since a paper by Kagan in 1999 popularised the term "rotator cuff of the hip" [1]. Abductor-related LHP due to tendinopathies, tendon tears or complete tendon ruptures of the gluteus medius and/or minimus tendon, hereafter referred to as hip abductor tendon pathologies (HATP), is a frequently encountered clinical entity. It has been estimated that hip abductor tendon tears may be present in as many as 25% of middle-aged women and 10% of middle-aged men [2].

In current literature, the term greater trochanteric pain syndrome (GTPS) has been used as a collective name for several trochanteric-related pathologies, including HATP [3]. This is illustrated in a Dutch study by Albers et al, which estimates that GTPS is the most prevalent tendinopathy of the lower limb in general practice with a prevalence of 45/1,000 persons. Historically, GTPS has routinely been attributed to an inflamed bursa over the

greater trochanter [4]. However, with advances in MRI, it has been demonstrated that HATP are present in most cases of trochanter-related pain, and an inflamed bursa at the greater trochanter is seldom found in the absence of HATP [5].

Even though promising conservative and surgical treatments of HATP have been described in recent years, this pathology is still often misdiagnosed and/or treated insufficiently [6-8]. HATP most often appears in women aged 40-60 years [7, 8]. Key presentations of HATP are pain and tenderness at the gluteal insertion on the greater trochanter. Frequently, onset of pain is insidious, though it can occur acutely after a strong contraction of the abductor musculature such as a slip, fall or forceful sporting action (e.g., sidestepping). The impact of this condition can be debilitating as it typically disturbs sleep and limits performance of common functional tasks, which might affect the patient's quality of life although information on the scale of this impact is limited [9].

The objective of this study was two-fold. First, to assess patient-reported outcomes and pain in LHP patients with clinically and MRI-verified hip abductor tendon pathology seen at a Danish orthopaedic outpatient hip clinic. Second, to elucidate the impairments of this patient group to healthcare professionals who commonly meet these patients (physiotherapists, general practitioners, rheumatologists and orthopaedic surgeons).

METHODS

Study setting

This study was conducted at a teaching hospital in the Central Denmark Region, which serves a local population of 250,000. Patients were referred to the local orthopaedic outpatient clinic by their general practitioner. Most often, patients with LHP are referred to our hip unit (hip prosthesis surgery). Owing to presence of a specialised hip preservation surgery unit, patients from other parts of Denmark were also referred to our outpatient clinic.

All citizens in Denmark have access to free and universal healthcare coverage. The setting of this study is therefore believed to represent the majority of outpatient clinics to which this patient group is referred.

Participants

Patients presenting with LHP were seen by two senior consultant orthopaedic surgeons (one hip joint preservation surgeon and one adult hip reconstruction surgeon) and assessed for inclusion in this study.

The clinical test used to raise the suspicion of HATP was widely adapted from Grimaldi et al [8]. Clinical suspicion of HATP was based on patient history and a clinical exam with palpably localised pain over the greater trochanter, a positive 30-second single-leg stance and/or Trendelenburg's sign/walk, and reduced strength in side-lying abduction tests by manual testing [2, 6, 8].

If clinical suspicion of HATP was found, the patient was referred for MRI. Identification of hip abductor tendon pathology on MRI was based on a previously published MRI algorithm [10]. For the present study, we registered whether or not hip abductor tendon pathology, including changes to the relevant muscles such as fatty degeneration, was present or not without registering further details.

Data were prospectively collected and retrospectively reviewed. Patients were eligible for inclusion if seen from September 2017 to November 2020. The inclusion criteria were: 1) MRI-verified HATP, 2) no manifest hip osteoarthrosis (OA) (a Kellgren-Lawrence score < 2) [6], 3) written informed consent to participate, and 4) age 18+ years.

In the inclusion period, 174 patients were eligible of whom 151 gave written informed consent to participate in this study. The median age was 55 years (interquartile range (IQR): 48-64, range: 18-81 years) and 94% of the participants were female. Patients with a normal MRI who were thus not seen for baseline testing or patients not

referred to an MRI by the two consultants were not registered in our cohort and could not be evaluated for this study. Unfortunately, a precise registration of the number of patients in these two groups is unavailable for this study.

Test parameters

Testing was performed by one dedicated physiotherapist or one dedicated research fellow (MD) in our hip clinic and included:

A semi-structured interview (patient history and complaints related to lateral hip pain were noted).

Patient-reported LHP assessed by a numerical rating scale (NRS) (0 = no pain, 10 = worst pain imaginable). The patients were asked to report their pain as an average of the past 14 days during rest, activity and as worst pain experienced. Worst pain was defined as the maximum pain experienced during any activity or rest. The pain was specifically reported in relation to the most affected hip, as some patients reported bilateral lateral hip pain.

Two hip-specific patient-reported outcome scores (PROs) (the Copenhagen Hip and Groin Outcome Score (HAGOS) and the Oxford Hip Score (OHS)) and one generic PRO (the EuroQol-Visual Analogue Scale (EQ-VAS)).

The HAGOS score consists of six separate subscales (pain, symptoms, physical function in daily living, physical function in sport and recreation, participation in physical activities and hip- and/or groin-related quality of life) and is used to assess physically active young to middle-aged patients with long-standing hip and/or groin pain (score range: 0 (worst)-100 (best)) [11].

The OHS assesses hip-specific pain and function and is designed for patients undergoing total hip replacement (THR) (score range: 0 (worst)-48 (best)) [12].

The EQ-VAS records the responder's overall current health on a vertical VAS of 0-100 and provides a quantitative measure of the patient's perception of their overall health [13]. The EQ-VAS is a part of the EQ-5D and its psychometric properties have been validated for THR and patients with rheumatoid arthritis [12].

Statistical analysis

Parametric data are presented as means with standard deviations and/or 95% confidence intervals (95% CI). Non-parametric data are presented as medians and 25%-75% IQR. Binary data are stated as proportions. Normality was evaluated by plotting the data.

Ethics

According to current Danish law, no formal ethical approval was required for this study. The National Data Protection Agency approved the study (1-16-02-125-19).

Trial registration: According to current Danish law, no formal ethical approval was required for this study. The National Data Protection Agency approved the study (1-16-02-125-19).

RESULTS

Parameter 1: Patient history

Typical complaints and impairments due to the lateral hip pain are listed in **Table 1**. Most often, an insidious onset of the LHP was reported with no recollection of trauma to the region. Some patients reported pain in the buttock region of the affected side and/or radiating pain down the lateral thigh.

During the interviews, it became clear that two different pain profiles were present in the patients. In the first

profile, pain was reduced by activity and worsened at rest. In the second profile, pain was reduced during rest and directly aggravated by activity.

TABLE 1 Impairments and complaints reported by patients with gluteal-related pain.

Lateral hip pain aggravated by
Lying on the affected side
Sitting for longer periods
Walking:
For longer distances
Uphill/ climbing a staircase
On bumpy/rugged ground
Getting in and out of a car
Running
Consequences
Interrupted sleep pattern
Difficulties in coping with work and leisure time activities
Reduced walking distance
Limping when tired or always: Trendelenburg gait
Paucity or complete stop of exercise-related activities
Reduced quality of life

Parameter 2: Pain

Median pain at rest was: 4 (IQR: 2-6, range: 0-10), during activity: 7 (IQR: 5-8, range: 0-10), and worst pain: 9 (IQR: 8-10, range: 3-10) (n = 134).

Parameter 3: Patient-reported outcome

The six subscales of the HAGOS are reported in **Table 2**.

Mean OHS was 24.8 (95% CI: 23.4-26.2; range: 8-42) (n = 132).

Mean EQ-VAS was 59.6 (95% CI: 56.2-63.1; range 5-100) (n = 143).

TABLE 2 Scores from the Copenhagen Hip and Groin Outcome Score.

Subscale	n	Mean ± SD	Median	95% CI	IQR	Range
Pain	129	42.9 ± 18.7	-	39.6-46.1	-	0-97.5
Symptoms	129	49.8 ± 18.7	-	46.5-53.1	-	7.1-96.4
ADL	129	42.2 ± 22.3	-	38.3-46.1	-	0-100
Sport/rec	129	-	28.1	-	12.5-40.63	0-100
PA	129	-	25	-	0-37.5	0-100
QOL	129	27.8 ± 15.4	-	25.1-30.5	-	0-75

ADL = activities of daily living; CI = confidence interval; IQR = interquartile range; PA = participation in physical activities; QOL = quality of life; SD = standard deviation; Sport/rec = physical function in sport and recreation.

DISCUSSION

Despite the growing body of evidence on HATP, the condition remains widely overlooked. Thus, it is crucial to enhance the knowledge of HATP to ensure adequate diagnosis and treatment. We found that the typical LHP patient with MRI-verified HATP seen in our outpatient clinic had a substantially affected patient-reported pain profile and patient-reported outcome scores.

Patient-reported hip abductor-related pain was reported in few studies [6, 14, 15]. In patients with gluteus medius tendinopathy, Mellor et al reported a mean pain of 4.9 (NRS) and Allison et al reported a mean pain of 5 (NRS) [6, 14]. In a cohort of patients with gluteus medius tendon tears, Chandrasekaran et al reported a pre-operative pain of 6.6 (VAS) [15]. In our study, pain at rest, during activity and worst pain were reported. This "activity-related pain score" was used as the patients repeatedly answered: "It depends on what I am doing", to our question about the level of their hip pain. In this manner, two pain profiles became apparent during the interviews. We believe that this may potentially serve as a supplement to clinical tests in differentiating tendinopathies, which we believe constitute profile 1 and genuine tendon injuries, which we believe constitute profile 2, the latter more likely being suited for surgical interventions. Unfortunately, we do not have individual MR findings that can be related to this hypothesis, nor do our data on patient-reported pain (test parameter 2) support these findings (test parameter 1), and this finding therefore needs to be further investigated.

Having studied LHP patients intensively for nearly four years during the study period, we still find it difficult to differentiate between a tendinopathy and a distinct tendon tear or rupture based on a patient history and clinical exam. As such, in our opinion, MRI is the gold standard in diagnosing partial and complete tendon tears [10]. Further research is needed on the optimal treatment method in individual tendon pathologies.

In our study, we used two hip-specific PROs (the HAGOS and the OHS) and a generic measure of health outcome (EQ-VAS). These scores were initially chosen as they address several of the impairments experienced by patients with abductor-related hip pain. The HAGOS scores found in this study are comparable to scores from a group of patients with femoro-acetabular impingement syndrome scheduled for arthroscopic hip surgery [16]. Noteworthy is the reduced score of the QOL subscale in our study at 27.8 points. Additionally, we found an OHS score of 24 points. In comparison, a Danish study reported an OHS score of 22 points in patients with end-stage hip OA (prior to THA surgery) [17], whereas an overall normal population reference OHS value of 44.88 points was reported by McLean [18].

In our study, EQ-VAS was 59.6, which is comparable to end-stage hip OA patients' pre-operative score of 57.9 in the Swedish Hip Arthroplasty Registry [19]. Thus, our findings support Fearon et al who stated that many patients with GTPS experience a decreased quality of life equivalent to that of severe hip OA [20]. Moreover, Fearon et al reported that greater trochanteric pain syndrome patients are the least likely to work full-time than a group of patients with severe hip OA and an asymptomatic group [20].

Strengths and limitations of this study

In this study, the inclusion criteria were broadly defined as LHP patients with hip abductor tendon pathologies verified by MRI and no manifest hip OA. It is a clear limitation that we did not register individual MRI pathologies but only registered these on a binary level. Nevertheless, we do not believe this affects the conclusion of this study. Our study population is, hence, a heterogeneous group of patients in terms of diagnosis and comorbidities. Several patients had additional lower back pain and had previously undergone surgery to the hip, lower back or limb, i.e. conditions that might affect the results. Many patients reported bilateral LHP, but only data from the most affected hip are presented. Furthermore, the severity of HATP (tendinopathy, partial tear or complete rupture) was not specified in this study. However, the study resumes the broad group of comorbidities that these patients represented on their initial outpatient visit in everyday clinical practice. Hence, the overall purpose of our study was to report on the generic LHP patient with HATP referred to our outpatient clinic and to illustrate that this is a severely affected group of patients. Noticeably, patient characteristics reported in this study are in this context comparable to those reported in other studies of patients with gluteal tendon pathologies [6, 14].

PROs used in the literature concerning HATP are numerous [6, 7]. In this study, validated hip joint questionnaires primarily used in other hip joint disorders were used, as no validated score existed for hip abductor-related LHP in our language in the project period. To date, only one PRO has been validated for GTPS; however, the Victorian Institute of Sports Assessment – Greater trochanteric pain syndrome (VISA-G) score was only recently validated in Danish by Jorgensen et al. Additionally, the HAGOS score was developed for younger patients with hip and groin pain.

CONCLUSIONS

Lateral hip pain patients with MRI-verified hip abductor tendon pathology describe pain and patient-reported outcome on a level equivalent to that of severe hip osteoarthrosis patients. Attention is needed to the presence of hip abductor tendon pathology to ensure adequate diagnosis and treatment. Further research is needed on the optimal treatment method in individual tendon pathologies.

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