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Treatment of Greater Trochanteric Pain Syndrome A Systematic Review

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Review Article

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ABSTRACT

Greater trochanteric pain syndrome (GTPS) is a clinical syndrome of lateral hip pain, including soft tissue pathologies such as trochanteric bursitis, external snapping hip, or gluteal tendon pathology. The aim of this systematic review is to determine the current evidence for the management of GTPS. The data bases of Scopus, Embase, Web of science, PubMed, PubMed Central, Medline OVID, CINAHL, UpToDate, Google Scholar, and Trip Medical Database were searched up to January 31, 2020. Human studies and original research in English language, published between January 2000 and January 2020 were considered (full-text articles, minimum sample size: 10 participants). Review articles or trial registrations were removed, but screened for additional literature. The sample size was 1570 patients (mean age 54.8 years, mean BMI 27.1). The gender ratio (female/male) was 3.8:1. There is good evidence for the short-term use of corticosteroid injections in GTPS but no evidence for benefit in the longer term. There is emerging evidence that exercise therapy is beneficial, but no specific GTPS exercise program has been established based on evidence to date. There is limited moderate evidence for SWT and low levels of evidence for any specific surgical intervention. Future research should aim to specify the diagnosis within the symptom complex of GTPS.

INTRODUCTION

Greater Trochanteric Pain Syndrome (GTPS) is defined as a condition of chronic peritrochanteric or lateral hip pain and tenderness typically affecting women in their 4th to 6th decade of life [1]. The clinical syndrome encompasses several soft tissue pathologies such as trochanteric bursitis, external snapping hip, or tendinopathies (including tears) of the gluteal tendons. Non-operative treatment options described for GTPS include topical or oral analgesics, physiotherapy and exercise, shock wave therapy and injection procedures. Operative management is typically

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referred to as being “reserved for recalcitrant cases”. With an aging population a higher incidence of GTPS will occur in the near future.

There was good evidence to support the use of corticosteroid injections in the short term (3 months), which demonstrated greater benefit than shock wave therapy or home training. Whilst there was little evidence, Reid recommended the use of surgical intervention in recalcitrant cases and highlighted that despite the interest in the use of physiotherapy and exercise programs for tendinopathies generally, there was no evidence for either in GTPS due to a paucity of studies.

LITERATURE REVIEW

The literature search was carried out by two independent reviewers. An additional independent search was simultaneously performed by a medical librarian with expertise in grey literature search in order to capture the available literature in its entirety [2]. The databases screened were Scopus, Embase, Web of science, PubMed, PubMed Central, Medline OVID, CINAHL, UpToDate and Google Scholar. The Joanna Briggs Institute’s Evidence Based Practice Database and Trip Medical Database were assessed for current and unpublished trials (grey literature). Eligible articles contained at least one of the following search terms: “lateral hip pain” or “greater trochanteric pain syndrome” or “gluteus (gluteal) tendinosis (tendinopathy, tendinitis, tendon injury, tendon tear)” or “hip abductor (abductor, abductor tendon, hip abductor tendon) tendinosis (tendinopathy, tendinitis, tendon injury, tendon tear)” and “treatment” or “therapy” or “surgery” or “repair”. Search terms for gluteal tendinopathy were included in the literature in an attempt to maximize the output of the literature and because gluteal tendinopathy has been reported as the most common underlying pathology for GTPS. The subset of articles specific to gluteal tendinopathy were analyzed separately as part of another review. The final search was performed on January 31, 2020 and limited to studies on humans, published in the English language between January 2000 and January 2020.

Study selection

All records identified through database searching were considered, duplicates were removed, and all abstracts were screened. Both retrospective and prospective studies were accepted. The minimum sample size was set to 10 participants. Case reports and case series with a study population <10 individuals were dismissed from further analysis. Review articles were not considered for this research. However, reference lists from identified review articles were screened manually for additional records not revealed through the database search. Only full text articles were included. Contact with study authors was sought for all “abstract only” articles in order to retrieve full text version of the research.

The data extracted from the included studies did not allow for meta-analysis, as statistical variance was not available for the variables of interest. To minimize the risk of bias, the underlying level of evidence was considered when synthesis of the results was carried out. Summary measures were performed by taking the sample size of each work into account. Frequency-weighted means were assigned to patient age, preoperative duration of symptoms and postoperative follow-up. Data from multiple studies were combined if data were obtained from a single patient population (e.g. reporting of two different follow-up times of a single patient population). Studies were excluded from weighted mean and range calculation in case of missing values. The remainder of the statistical analysis was descriptive.

Sample preparation

The electronic search strategy returned a total of 659 results. Duplicates were removed. Manual reference screening from review articles revealed three additional articles that met our inclusion criteria, leaving 174 articles for abstract screening. Sample size <10, foreign language, unspecific content (e.g. tendinopathy in multiple anatomic locations) or publication type (protocol paper, surgical/technical guidelines, comments) were the reasons for excluding 112 articles. Full text versions of the abstract could not be retrieved for five articles despite contact with the corresponding authors. Two conference abstracts with no full text articles were removed leaving 57 papers for full text review.

Study characteristics

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A total of 22 publications reported on treatment of GTPS. There were five randomized controlled trials (RCTs, LoE Ib according to the Oxford Centre of Evidence based Medicine), the remaining literature consisted of case control studies, cohort studies and case series. None of these publications specified the underlying pathology of the syndrome and/or allowed for discrimination of the results according to diagnosis and were broadly analysed as GTPS.

Demographic data

The sample size among the publications varied between 11 and 300 participants with a total of 1570 patients (1587 hips). The overall mean age (sample size adjusted) was 54.8 years, and the mean BMI (provided in 7/22 publications was 27.1. Male participants were excluded in 3 publications, while gender ratio (female/male) was calculated as 3.8:1 for the remaining articles. Information on laterality was given in 4 papers with 50.3% right hips treated.

Common inclusion criteria were ongoing lateral hip or thigh pain reproducible by either provocative tests or tenderness over the greater trochanter on palpation. Adult age (age >18) was a requirement in seven studies. Hip osteoarthritis, history of trauma or prior surgery to the ipsilateral hip joint were among the common exclusion criteria, together with concomitant lower back pain and/or sciatica, systemic inflammatory or neurological disorders. Local injections within 3 months prior to treatment, or male sex were exclusion criteria on rare occasions (e.g. injection as the therapeutic intervention, hormone therapy studies). The mean duration of symptoms of an average of 5.9 months was reported in 7/22 articles. 5 papers reported symptoms had to persist at least >6 months prior to treatment. Prior treatment (from 17 articles consisted of NSAID, rest, physiotherapy with stretching and strengthening or corticosteroid injection.

Diagnosis of GTPS was established almost universally through clinical examination of the presence of lateral hip pain (pain with walking, stair climbing or lying on the affected side) combined with tenderness on palpation over the greater trochanter. A confirmatory local injection was rarely performed for establishing the diagnosis. Imaging examinations were performed in only 10/22 studies (ultrasound: 5 studies, x-ray: 3 studies, MRI: 2 studies), while 3 studies decided in each individual case whether any form of imaging was necessary. 9 studies did not perform imaging examinations.

The studies included in this review used a variety of outcome measures. Pain was most commonly assessed using VAS (Visual Analog Scale; 13 studies or NRS (Numeric Rating Scale. Common patient reported outcome measurement tools were HHS (Harris Hip Score) in 6 articles, OHS (Oxford Hip Score; 2 publications, or ODI (Oswestry Disability Index. mHHS (modified Harris Hip Score), HOS (Hip Outcome Score), Global rating of change scale11, SF-12, SF-36 (Short Form-36), EQ-5D (EuroQol-5D), VISA-G (Victorian Institute of Sport Assessment-Gluteal tendon), iHOT-33 (international Hip Outcome Tool), Merle D'Aubigne Postel score 12, HOOS (Hip Dysfunction and Osteoarthritis Outcome Score), HAGOS (Hip and Groin Outcome Score), lateral hip pain questionnaire or the Modified Rating Scale for Hip Disabilities of the Japanese Orthopaedic Association29 were scores for outcome determination used in one publication each. Patient satisfaction was reported in 8 studies and was commonly carried out on a Likert scale. The presence of gait abnormality (Trendelenburg test) was the only functional outcome assessments reported in one study, while no other functional outcome parameters could be retrieved from the remaining articles.

An exercise program (10-15min home exercise twice daily for 12 weeks) improved pain, function and quality of life in a female population suffering from GTPS. Outcome was assessed at 12 weeks and one year after treatment. Interestingly, the type of exercise did not seem to affect the outcome. Similar favorable results for a home therapy program with progressive slow repetitive exercises including piriformis and iliotibial band stretch, straight leg raise, gluteal strengthening and wall squats. In this study, the exercise program performed over 12 weeks (twice a day, 7 days a week) lead to a patient reported recovery rate of 80% and to significant improved pain levels (NRS) fifteen months from baseline. Home Training (HT) was equally as successful as radial shock wave therapy (SWT) and significantly better than a single Corticosteroid Injection (CSI) at 12 weeks and showed the lowest proportion of adverse events and the highest rate of long-term success.

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DISCUSSION

Surgical treatments for GTPS were endoscopic or open bursectomy of the trochanteric bursa (with or without simultaneous iliotibial band (ITB) release), distal lengthening of the fascia lata22 or trochanteric reduction osteotomy12. Endoscopic ITB release with concomitant trochanteric bursectomy has been shown to result in significant and clinically important improvement of pain (NRS) and function (HHS) in a study published. A larger series confirmed these results, showing excellent improvements in pain (VAS) and function (OHS, i-HOT-33) in patients recalcitrant to conservative treatment for GTPS [3]. The mean follow-up was 28 and 21 months, respectively. Z-lengthening of the ITB also showed favorable results in terms of pain relief and functional improvement in studies published. Follow-up times averaging between 43 and 52 months. 7/9 publications reported complication rates for their surgical intervention. A high complication rate with 3 in 10 patients returning to theatre within the follow-up period of 23.5 months after trochanteric reduction osteotomy, while complication rates with soft tissue procedures (open or endoscopic ITB release/lengthening and bursectomy) varied between 08,27.

This systematic review summarizes treatment options and their results for greater trochanteric pain syndrome. However, it must be emphasised that GTPS embraces a variety of diagnoses, such as trochanteric bursitis, external snapping hip, or tendinopathies (including tears) of the gluteal tendons. Treatment of GTPS therefore might not have the specificity or the effectiveness of a treatment that focuses on one specific underlying diagnosis/pathology. This was demonstrated in the narrative review by Lin and Fredericson, who considered different treatments relative to the perceived source of pain eg. tendinopathy or bursitis. Recommendations derived from GTPS papers can not necessarily be applied to the treatment of gluteal tendinopathy, or other individual specific pathological diagnoses, and any such treatment derivations should be performed with caution.

This review was based on 22 articles published over the last 20 years and reflects the outcome of 1570 individual cases (1587 hips). The review aims to provide a framework for the treatment of this common condition and identify gaps in the literature. The evidence provides a mixed picture on the effectiveness of exercise therapy. Whilst a 12 week home program showed a significant impact on patient outcome that was comparable to SWT and superior to a single CSI, a specifically designed physiotherapy exercise program for GTPS (GLoBE: Gluteal La Trobe University exercise program) did not show significantly improved results when compared to “sham” exercise. Hence, the available evidence supports the effectiveness of “exercise” in treatment of GTPS, but the type and mode of exercising still needs to be defined.

Whilst therapeutic taping has been shown to alter gait patterns in GTPS patients24, biomechanical improvements were not different between active and sham tape application, pain reduction did not meet the minimal clinically important difference and outcome assessment was only performed immediately after completion of the gait analysis. In the absence of data regarding the clinical short- and long-term impact, the available evidence does not support the use of taping for treatment of GTPS.

Custom-made foot orthotics cannot be recommended based on only small reductions in the use of analgesia, and only level IV evidence. There is strong evidence for the use of corticosteroid injections but only in the short term. A single ultrasound-guided CSI did not perform better over a 6 months evaluation than saline in terms of pain reduction and function [4]. Four studies support the positive short-term effect of CSI, particularly in the first 4-8 weeks, but the therapeutic benefit has been shown to last no longer than 3-6 months. The therapeutic response was reported as less successful in patients with structural abnormalities within the gluteal tendons 30, outlining the importance of treating the underlying pathology rather than the syndrome of GTPS. The available evidence supports the use of corticosteroids in GTPS only for short-term pain relief.

There is evidence for limited moderate short-term improvement with the use of SWT in GTPS is supported by Level Ib evidence. Better results using the NRS score and patient rated recovery for radial shock wave therapy when compared to home training or a single corticosteroid injection four months after treatment. However, fifteen months from baseline, radial shock wave therapy and home training were equally successful and treatment failures of 26% were reported for SWT. Methodological reporting does not allow for recommendations relating to total energy, energy per session or number of sessions for SWT.

There is limited low level evidence for surgical interventions for GTPS but surgical treatment in cases recalcitrant to other treatment methods is consistently recommended despite the evidence gap [5]. Soft tissue interventions such as endoscopic or open bursectomy ± ITB release have shown some improvement. Longitudinal or cross-shape splitting of the ITB did not have inferior outcome measures when compared to Z-lengthening procedures at the level

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of the GT or at supracondylar level. Complication rates up to 8% have been reported for these soft tissue procedures, whilst a series of trochanter reduction osteotomies was found to have a 30% complication rate at 2 year follow up12. Given the evidence for harms, the trochanteric reduction osteotomy surgical approach should be less preferred.

CONCLUSION

There is good evidence for the short-term use of corticosteroid injections in GTPS but no evidence for benefit in the longer term. There is emerging evidence that exercise therapy is beneficial, but no specific GTPS exercise program has been established based on evidence to date. There is limited moderate evidence for SWT and low levels of evidence for any specific surgical intervention, particularly considering the complication rate (0-8%). Future research should aim to specify the diagnosis within the symptom complex of GTPS.

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