Clinical Radiology xxx (2017) 1–7

Contents lists available at ScienceDirect

Clinical Radiology

journal homepage: www.clinicalradiologyonline.net

Do ultrasound guided trochanteric bursa injections of corticosteroid for greater trochanteric pain syndrome provide sustained benefit and are imaging features associated with treatment response?

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ARTICLE INFORMATION

Article history:
Received 19 September 2017
Accepted 20 November 2017

AIM: To assess intra-bursal corticosteroid injections (ICSI) efficacy and duration of action in the management of greater trochanteric pain syndrome (GTPS). The secondary aim was to identify patient and ultrasound (US) features predictive of treatment response.

MATERIALS AND METHODS: Consecutive prospectively recruited patients undergoing US-guided ICSI therapy for GTPS received baseline pre-injection questionnaires assessing pain at rest and activity, demographics and comorbidities. Baseline US and radiography findings were reported prospectively. Follow-up was performed at 6 weeks and 6 and 12 months, and change in pain scores assessed using the Wilcoxon signed rank test. Logistic regression examined associations between demographics, US findings, and a clinically significant reduction in pain score ($\geq$50%).

RESULTS: Over 6 months, 127 patients were recruited with a median age of 63.5 years and 90% were female. The greatest pain reduction was between baseline and 6 weeks at activity (median 8 versus 5, $p<0.001$). The majority of patients noted a reduction in pain score, but the percentage of patients receiving a $\geq$50% reduction at 6 weeks, 6 months, and 12 months for pain at rest was 41%, 37%, and 36%, respectively. Regression models suggested only gluteus medius bursitis was weakly associated with pain reduction.

CONCLUSION: ICSIs confer a benefit in pain reduction to a large proportion of patients in the short term, but this may not be reduced by a clinically significant amount. This small effect size and lack of predictive imaging features suggests initial management including subsequent steroid injection could be provided without imaging guidance in the majority of cases.

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https://doi.org/10.1016/j.crad.2017.11.020
0009-9260/

Introduction

Greater trochanteric pain syndrome (GTPS) is a common cause of lateral hip pain affecting up to 15% of the population and is associated with the following comorbidities: lower back pain, hip and spine osteoarthritis, obesity, and ilio-tibial band tenderness.[1–3] Patients present with intermittent or continuous lateral hip pain, which is exacerbated by active abduction, passive adduction, and palpation.[4] GTPS and greater trochanteric bursitis are often used interchangeably; however, the understanding of GTPS has altered[5] and it has become clear that inflammation is not always a salient feature and in fact, overuse or injury of the gluteal muscles and tendons may be the dominating features.[5,6]

Around 60% of patients recover within a year using conservative management including analgesia, ice-pack application, weight loss, and physiotherapy aimed at increasing flexibility and muscle strength.[7] For patients that do not respond to conservative management, intra-bursal corticosteroid injections (ICSI) have been shown to provide symptomatic relief in the short-term; however, the longevity of symptomatic relief remains unclear.[8,9]

Imaging in GTPS is infrequently used for diagnostic purposes but ultrasound (US) commonly plays a role in guiding ICSI.[6] Currently, there is conflicting opinion regarding whether US guidance alters treatment outcomes and whether pathology identified can predict treatment response, with many series not assessing imaging features or involving only small numbers.[8,10–12] A randomised control trial by Cohen *et al.* (2009) concluded that, aside from increasing overall cost and complexity of the treatment, there was no difference in clinical outcomes between fluoroscopically guided and non-guided ICSI injections.[13] Wilson *et al.* (2013) conducted a retrospective study reviewing 26 US-guided injections versus 13 non-guided and demonstrated no significant difference between guided and non-guided injections.[10]

The primary aim of this study, therefore, was to evaluate whether US-guided ICSI provide patients with clinically significant symptomatic relief at 6 weeks, 6 months and 12 months post-injection during exercise and at rest. The secondary aim was to assess whether evidence of certain US abnormalities could predict treatment response to ICSI.

Materials and methods

Study design and ethics

This study was a prospective, longitudinal, analytical evaluation of consecutive patients referred for US-guided greater trochanteric bursa injection. There was no change to current management of patients and this study was granted service evaluation status by the chairperson of the institutional review board with no requirement for full ethical committee review. Patient consent was obtained at the time of injection appointment following receipt of the patient information sheet. Over a 6-month period consecutive patients aged 18 or above who provided valid consent receiving US-guided ICSI for GTPS were included in the study.

Study procedure and data collection

Immediately prior to ICSI, patients were given a baseline questionnaire to record demographic data, comorbidities, previous trauma or surgery to the affected hip, previous treatments for the affected hip, current symptoms in the affected hip, and limitations on certain activities.[14] An 11-point numeric rating scale (NRS) ranging from 0–10 (0=no pain, 10=worst pain) was incorporated into the baseline questionnaire to assess patient's pain at rest and on activity.[14] In order to assess patients' health-related quality of life (HRQL) in a standardised format, a short form 12 (SF-12) questionnaire was completed, which aims to quantify HRQL by compiling a physical component summary (PCS) and a mental component summary (MCS).[15] PCS and MCS are computed using the scores of 12 questions and range from 0 to 100, where a zero score indicates the lowest level of health measured by the scales and 100 indicates the highest level of health.[15]

During the US examination, one of three consultant radiologists (A.J.G., E.R. and P.R., with between 8 and 18 years of experience) completed a proforma to document the following: greater trochanteric bursa (absent/present), gluteus medius bursa (GMB; absent/present), gluteal tendinopathy (absent/present), gluteal tendon tear (absent/present), iliotibial band thickening (absent/present), greater trochanteric cortical irregularity (absent/present), and evidence of hip or knee osteoarthritis based on available radiographic imaging (absent Kellgran & Lawrence [K&L] 0–1/present K&L 2–4).

The ICSI consisted of 40 mg triamcinolone with 3 ml of 1% lidocaine injected into the greater trochanteric bursa under direct US visualisation.

Each patient was contacted over the telephone at 6 weeks, 6 months, and 12 months post-ICSI to conduct the follow-up questionnaire and NRS.

Analysis

Statistical analysis was carried out using STATA software Version 13 (College Station, TX, USA). Descriptive statistics including mean (standard deviation [SD]), median (interquartile range [IQR]) for continuous variables and percentages for categorical variables were reported for baseline characteristics. To evaluate change in pain scores from baseline to 6 weeks, 6 months, and 12 months, Wilcoxon signed rank sum tests were performed and the level of significance set at $p<0.05$. The proportion of participants improving by more than the minimum clinically important difference (MCID), which was set at $\geq$50% pain reduction,[13,16] was also evaluated. Using change greater than MCID as the outcome, logistic regression models examined associations between this outcome and US-identified pathologies at different follow-up time points. Logistic models were adjusted for age, body mass index (BMI), gender, and

Please cite this article in press as: Bolton WS, et al., Do ultrasound guided trochanteric bursa injections of corticosteroid for greater trochanteric pain syndrome provide sustained benefit and are imaging features associated with treatment response?, Clinical Radiology (2017), https://doi.org/10.1016/j.crad.2017.11.020