


# Management of Greater Trochanteric Pain Syndrome After Total Hip Arthroplasty: Practice Patterns and Surgeon Attitudes

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## ABSTRACT

**Introduction:** Greater trochanteric pain syndrome (GTPS) or trochanteric bursitis is described as pain on the lateral side of the hip that does not involve the hip joint and can be elicited clinically by palpation over the greater trochanter. To date, there remains no consensus on clinical guidelines for either diagnosis or management of GTPS.

**Methods:** To understand the practice patterns, beliefs, and attitudes relating to the management of GTPS after total hip arthroplasty, a survey was developed and completed by Canadian arthroplasty surgeons. The final survey consisted of 23 questions divided into three sections: 1) screening questions; 2) demographic information; and 3) practice patterns, attitudes, and beliefs.

**Results:** Most surgeons use physical examination alone for diagnosis. A detailed analysis indicates that surgeons primarily treat GTPS with oral anti-inflammatories (57.1%), structured physiotherapy (52.4%), and steroid injections (45.2%). Management options are typically nonsurgical and comprise a combination of either unstructured or targeted physiotherapy, corticosteroid injections, or platelet-rich plasma.

**Discussion:** There remains an absence of clinical consensus for the diagnosis and management of GTPS after total hip arthroplasty. Physical examination is most often relied on, regardless of the availability of imaging aids. While common treatments of GTPS were identified, up to one-third of patients fail initial therapy.

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**G**reater trochanteric pain syndrome (GTPS) or trochanteric bursitis is classically described as pain on the lateral side of the hip that does not involve the hip joint and can be elicited clinically by palpation over the greater trochanter.<sup>1,2</sup> Although diagnosis can be made with clinical examination alone, an ultrasound or MRI is sometimes used to increase sensitivity.<sup>3</sup> GTPS can include a multitude of pathologies, including gluteus medius/minimus tears, inflammation of the trochanteric bursa, and snapping hip syndrome (coxa saltans).<sup>4</sup>

Total hip arthroplasty (THA) is one of the most common and successful operations in Canada, with over 95% of patients reporting good or excellent outcomes.<sup>5</sup> However, up to 17% of patients can suffer from GTPS postoperatively.<sup>6</sup> GTPS can be associated with altered hip biomechanics from implant malposition or from direct injury to the abductor musculature intraoperatively.<sup>7</sup> Other causes of GTPS include inflammation of the bursa overlying the greater trochanter secondary to the surgical incision<sup>8</sup>; however, histopathologic studies often find little evidence of inflammation.<sup>9</sup> It has been argued that a surgical approach for THA can affect the prevalence of GTPS. Advocates for using a direct anterior approach (DAA) adduce a decrease in postoperative limp and GTPS because neither the iliotibial band nor the abductor musculature is violated.<sup>10</sup> Patients who suffer from GTPS postoperatively are known to have impaired functional status with reduced walking speed and slower timed up and go tests.<sup>11,12</sup> Recalcitrant cases of GTPS may necessitate surgical débridement, increasing the risk of surgical complications and infection.<sup>13</sup>

To date, there remains no consensus on clinical guidelines for either diagnosis or management of GTPS. Management options for GTPS are typically nonsurgical and comprise a combination of unstructured or targeted physiotherapy, corticosteroid injections, and platelet-rich plasma (PRP).<sup>14</sup> When considering PRP in particular, physicians can use numerous different combinations and filtration rates—rendering the injections measurably different between treatment centers.<sup>15</sup> Overall, there exists a paucity of high-quality evidence surrounding the ideal management of GTPS, with a lack of a collective opinion from clinicians on the treatment of this common problem.

The purpose of this study was to gain an understanding of the practice patterns, beliefs, and attitudes of Canadian arthroplasty surgeons because it relates to the management of GTPS after THA. Our objectives were to understand the current practice paradigms and identify areas for future research and guideline development.

## Methods

### Survey Development

A survey was developed collaboratively by the authors. The survey was piloted with a small focus group consisting of surgeons and an epidemiologist. The initial draft of the survey was built using SurveyMonkey® and distributed for feedback. This process was repeated until

there were no new changes proposed. The final survey consisted of 23 questions divided into three sections: 1) screening questions; 2) demographic information; and 3) practice patterns, attitudes, and beliefs (Supplemental Appendix 1: <http://links.lww.com/JG9/A308>). The study was approved by the local ethics board.

### Survey Administration

After obtaining ethics approval, the survey was distributed through the Canadian Arthroplasty Society (CAS), a subspecialty organization within the Canadian Orthopaedic Association. The survey was distributed to active CAS members, all of whom are practicing staff arthroplasty surgeons. The survey was first sent out by e-mail on the opening day of the CAS Annual Meeting, November 19, 2019, with reminder e-mails on December 16, 2019, and January 15, 2020, and the survey was closed out to new responses on January 29, 2020.

### Data Analysis

All data are reported descriptively, with continuous data as mean and standard deviation and dichotomous data as frequencies and percentages. Estimated rates of GTPS were compared across the different surgical approaches using an analysis of variance, with significance set at  $P < 0.05$ .

## Results

### Characteristics of the Respondents

A total of 54 responses were received (34.4% response rate). All respondents were staff orthopaedic surgeons who regularly perform THA. The mean age of respondents was 47.5 (SD  $\pm$  12.2) years. Respondents from all 10 Canadian provinces were included, and the median year of graduation from residency was 2005 (range 1975 to 2017). More than half of all respondents primarily practiced at an academic center (58.8%) while 37.3% worked primarily at community sites and only 3.9% worked in rural settings.

### Practice Patterns

The most commonly used surgical approach for THA was direct lateral (52.4%), followed by the posterior/posterolateral approach (35.7%) and the DAA (11.9%). Diagnosis of post-THA trochanteric bursitis was solely clinical for most of the respondents (69.1%), with only 4.8% of surgeons routinely obtaining a diagnostic ultrasound. Another 26.2% said that they sometimes obtained diagnostic ultrasound. The respondents estimated that, on average, 8% of their THA patients

developed postoperative trochanteric bursitis (range 0 to 20%). This estimate was lower among those using the DAA approach (5.0%) compared with those using the lateral (8.1%) or posterior (8.9%) approaches; however, this difference was nonsignificant ( $F = 1.98$ ,  $P = 0.17$ ). The most common first-line treatments of trochanteric bursitis were oral anti-inflammatories (57.1%), structured physiotherapy (52.4%), and steroid injections (45.2%) (multiple selections allowed, Figure 1). The median length of physiotherapy prescribed was 6 weeks (range 3 to 12) while the median time for physiotherapy to be considered “failed” was 12 weeks (range 3 to 52). On average, 31% (SD: 26.8%) of patients with post-THA trochanteric bursitis were estimated to fail physiotherapy.

In patients who were resistant to physiotherapy and/or oral anti-inflammatories (54.8% and 23.3%, respectively), the most common treatment for trochanteric bursitis was corticosteroids and PRP. No other uses were reported for PRP while 31% reported using corticosteroids for both first-line and resistant cases and 9.5% used corticosteroids primarily for first-line treatment.

Among all patients with post-THA trochanteric bursitis, surgeons estimated that on average, 29.9% (SD: 25.7%) would eventually receive a corticosteroid injection. Only 0.2% of these patients (SD: 0.9%) received PRP injections. The most common number of corticosteroid injections was one injection (40%, range 1 to 3).

All surgeons who provided PRP injections only provided a single injection (15%). Most injections were not administered under ultrasound guidance for either corticosteroid injections (82.5%) or PRP (75.0%).

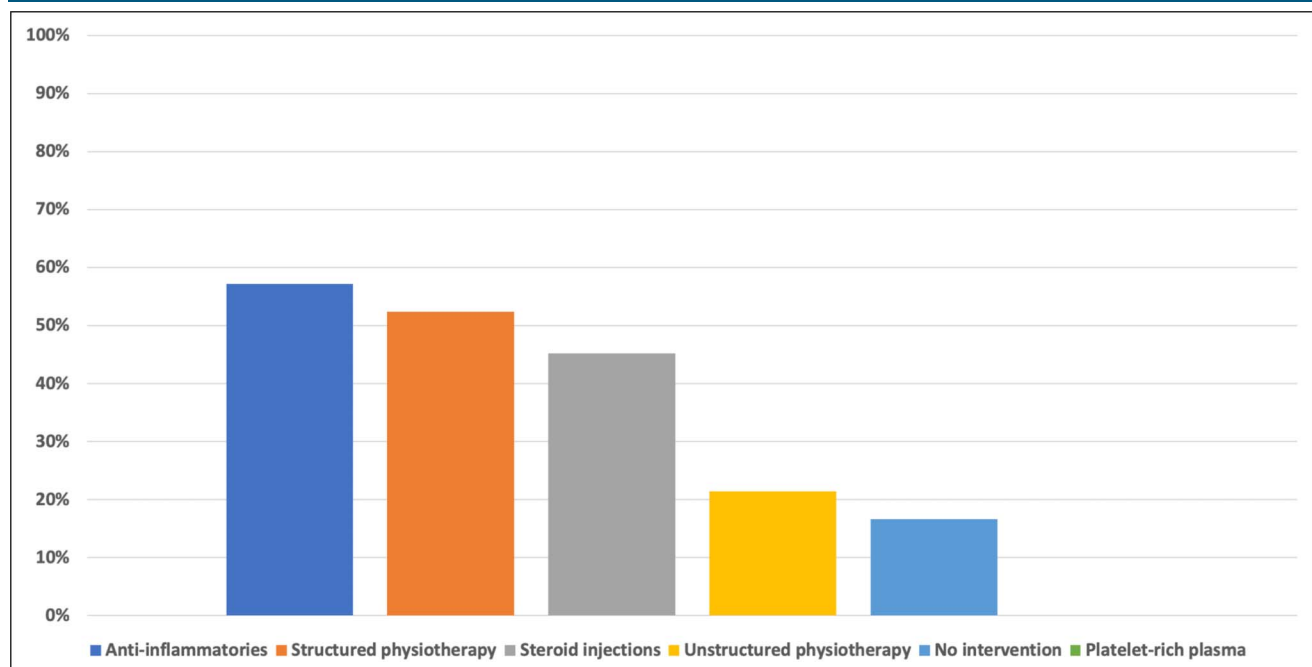
### Attitudes and Beliefs

The potential benefit of PRP in the setting of trochanteric bursitis was divided, with 54.8% of respondents being unsure, 14.3% thinking it has potential benefit, and 31% thinking that it does not. Furthermore, most of the respondents (85.7%) agreed that if high-quality evidence supported the use of PRP, and if cost was not an issue, they would use PRP in treating this condition. Finally, over half of all respondents (54.8%) stated that they would participate in a randomized trial assessing the efficacy of PRP in post-THA trochanteric bursitis.

### Discussion

This nationally distributed survey highlights an absence of clinical consensus for the diagnosis and management of GTPS after THA. Most surgeons do not use imaging to aid with diagnosis, although 30% of respondents use ultrasound at least in a proportion of their cases. There was a near-equal distribution between first-line treatments, including physiotherapy, corticosteroid injections, and oral anti-inflammatories (Figure 2). The use of PRP is infrequent with no surgeons using PRP as first-line treatment

**Figure 1**



Graph showing the most commonly used first-line treatments of trochanteric bursitis in order of most common to least.

and uncertainty regarding its potential benefits. Ideally, consensus guidelines would direct orthopaedic surgeons with best practices for management of GTPS. However, an absence of high-quality evidence on this topic would prevent any such guideline from being created or having meaningful utility.

The estimated proportion of GTPS seen in our survey (8%) is in line with the best available evidence (3 to 17%).<sup>1,16</sup> Using the results of our survey, this would suggest that nearly 5,000 patients are affected by post-THA GTPS each year and nearly 1,500 patients per year receive and subsequently fail first-line therapy for post-THA GTPS in Canada alone. Given the absence of standardized diagnostic guidelines, this may be an under-representation of total burden because of underdiagnosis.

In our study, more than 60% of surgeons use corticosteroids as either a first-line or second-line treatment, providing symptomatic relief through their anti-inflammatory properties. However, a proportion of

symptoms generated in GTPS do not arise from inflammation itself, as evidenced by histologic specimens collected intraoperatively in recalcitrant cases.<sup>9</sup> The absence of inflammation in these cases supports the use of treatment modalities other than corticosteroids, such as physiotherapy and PRP, the latter of which may provide benefit through cellular regenerations of torn abductor tendons.<sup>17</sup> Given that the use of steroids may increase the risk of postoperative infection, alternative first-line treatments should continue to be studied.<sup>18,19</sup>

The complexity in both treatment and diagnosis of GTPS reflects the multiplicity of attitudes and perceptions toward this condition. In a recent systematic review of GTPS after THA, more than 10 different diagnostic criteria for trochanteric pain have been reported, but only a single tool has reported its sensitivity and specificity of diagnosis.<sup>6</sup> The lack of consensus in the treatment approach is evident through the multiple treatments used, including PRP, steroids, a variety of physiotherapy protocols, peripheral nerve stimulation,

**Figure 2**

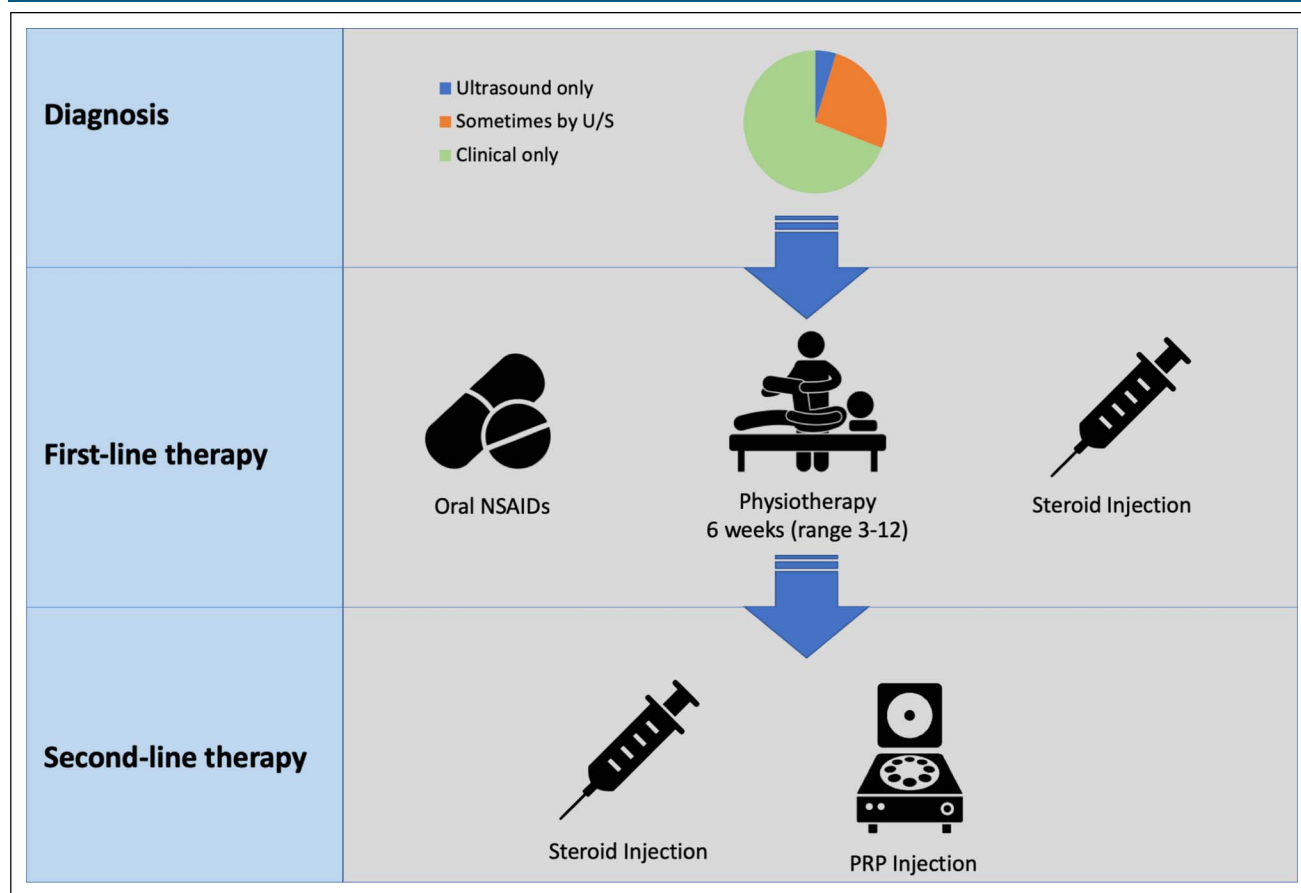


Diagram representing most common methods of diagnosis (diagnosis), most common first-line treatment options (first-line therapy), and secondary treatment options for trochanteric bursitis (second-line therapy).

local anesthetic injections, and others. Five studies reported on the utility of corticosteroid injections either alone (one study) or in combination with home physiotherapy treatment protocols. Four studies reported on treatment of trochanteric bursitis resistant to nonsurgical management using either gluteal bursectomy or iliotibial band lengthening. No studies reported on outcomes with a follow-up of longer than 1 year, limiting the reliability of outcome assessments.

In our study, surgical approach was not associated with a notable difference in the surgeon-perceived rates of post-THA GTPS. While it is important to consider that this is based on surgeon estimates and not real data, it is still interesting to compare these estimates across approaches. Although a lack of notable difference among the various approaches is consistent with previous clinical literature,<sup>16</sup> lower rates of GTPS are sometimes touted as a potential benefit of certain approaches. Among the myriad of potential causes of GTPS, gluteus medius/minimus tears (i.e., “bald trochanter” syndrome<sup>20</sup>) can occur with any surgical approach either because the insertion is not visualized or because it fails to heal after intraoperative repair.<sup>21</sup>

By contrast, the literature surrounding the treatment of GTPS in patients who have not previously received total hip replacement is of considerably higher methodologic quality. Since 2002, there have been 13 randomized controlled trials evaluating nonsurgical treatment of GTPS.<sup>22-24</sup> The best available evidence from these trials suggests that PRP and physiotherapy were likely to be somewhat more effective than corticosteroids and anti-inflammatories alone in reducing pain or increasing hip function at 3 to 6 months.

Although these studies are useful, these results may be challenging to apply to a population of patients suffering from GTPS after THA. Patients with primary GTPS are often younger, more active, and have fewer comorbidities than those who suffer from GTPS after THA.<sup>25</sup> Some of the techniques studied among patients with GTPS in native hips may not even be feasible to study in patients who suffer from GTPS after THA, such as extracorporeal shock wave therapy or acupuncture, given the risk of either dislocation or infection, both catastrophic outcomes.

Our study, similar to any cross-sectional survey, has limitations. Our study was only administered through a single orthopaedic surgery organization in Canada and as such might not reflect the opinions of surgeons outside of this group. Although a low response rate to our survey may reflect generalizability secondary to selection or responder bias, our survey yielded a higher response rate

compared with similar studies in other fields within orthopaedics.<sup>26</sup> Finally, other conservative modalities, such as dry needling, were not inquired about in this survey. Despite these limitations, our survey provides the best possible practice overview and highlights the breadth of both diagnostic and treatment approaches to this common condition.

## Conclusion

THA surgeons in Canada often use physical examination alone to diagnose GTPS after THA. Surgeons treat with oral anti-inflammatories, physiotherapy, or corticosteroid injections, with up to one-third of patients failing initial therapy. Although few surgeons use PRP, there is substantial interest in its potential efficacy for treating GTPS. Additional research is needed to evaluate the use of PRP, along with standardized physiotherapy and steroid injection protocols in the management in GTPS, a common and often debilitating condition.

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