

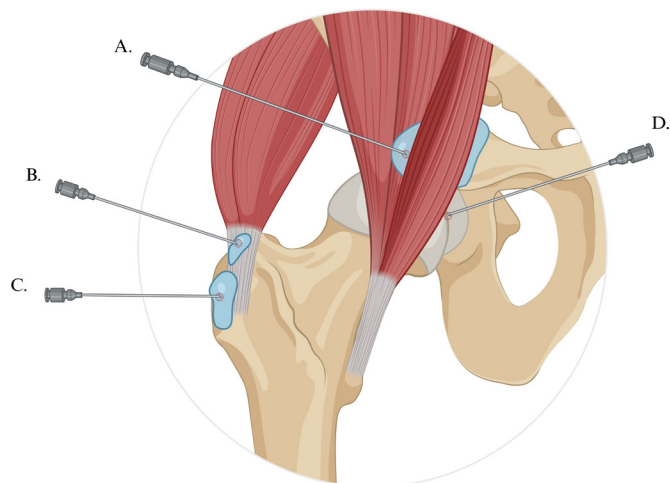


Figure 2 Injection sites for hip pain. A—iliopsoas bursa; B—gluteus medius/minimus tendon sheath; C—greater trochanter bursa; D—hip joint. Note that the injection is around the gluteus medius/minimus tendon or tendon sheath. Image courtesy of Sebastian Encalada, MD, Mayo Clinic, Jacksonville, Florida.

or US is recommended in patients with obesity where palpation of the greater trochanter can be difficult or when landmark-based injections have failed.

US guidance has been recommended for tendon sheath injections and iliopsoas bursa injections.¹⁵² There has been no study that compared landmark with US in gluteus medius/minimus tendon injections. Visualization of the tendon with US is an obvious advantage to prevent intratendon injection and possible rupture.

There has been no study comparing iliopsoas injection with image-guided (US or fluoroscopy) versus landmark-guided techniques. Fluoroscopy-guided iliopsoas bursa CSI (TA 40 mg in 5 mL lidocaine) has been described with the center of the acetabular roof as the target area and confirmed by injection of contrast.¹⁵³ The study of 39 patients showed 49% had ‘clinically relevant improvement’ at 1-month follow-up. A cadaver study noted 90% accuracy with USG injection, with the injectate covering 50%–100% of the iliopsoas tendon.¹⁵⁴

Treatment of GTPS, efficacy of injections

Treatments of GTPS include PT, analgesics, NSAIDs, injections; surgery is performed in recalcitrant cases.

Trochanteric bursa injection

Small observational studies suggested that local CSI may be beneficial in the management of trochanteric bursitis.^{155 156} CSI using 60 mg MPA in 2.5 mL lidocaine, performed either with fluoroscopy or landmarks, resulted in >50% pain relief at 1 month (61% of patients) and at 3 months (44% of patients), with a perceived positive global effect.¹⁴⁸ TA 20 mg in 3 mL local anesthetic under fluoroscopy significantly reduced the pain at 1-week follow-up.¹⁵¹ A review noted that injection into the ‘greater trochanteric bursa’ (specifically, the subgluteus maximus bursa) in patients with trochanteric bursitis resulted in longer pain reduction compared with injection into the gluteus medius bursa or extrabursal sites. Additionally, image-guided injections resulted in maintained lower pain scores for up to 6 months.¹⁵⁷

Two randomized trials compared CSI into the greater trochanter with other modalities.^{158 159} An RCT showed CSI (25 mg prednisolone in 4 mL mepivacaine) into the point of

maximal tenderness or swelling in the greater trochanter to be more effective than home training (progressive repetitive exercises) or shock wave therapy at 1 month but not at 4 months or 15 months.¹⁵⁹ Another RCT showed that CSI (40 mg TA in lidocaine) into the point of maximal tenderness in the greater trochanter provided more pain relief at 3 months follow-up than usual care (analgesics, physical therapy), but there was no difference at 12 months.¹⁵⁸

A randomized double-blind placebo-controlled (normal saline) trial investigated the efficacy of CSI (1 mL betamethasone in 4 mL lidocaine) in GTPS (lateral hip pain reproduced by palpation of the greater trochanter).¹⁶⁰ Under US guidance, the injection was made either within the peri-trochanteric bursa (if visualized) or at the surface of the distal gluteus medius tendon near its insertion at the postero-lateral facet of the greater trochanter. There was no difference in pain relief after 1 month, although there was a trend towards improvement in pain scores in favor of the corticosteroid ($p=0.08$). There were no significant differences at 3 or 6 months.¹⁶⁰ The investigators concluded that CSI for trochanteric bursitis is of limited benefit, that glucocorticoid injections are of no greater efficacy than the injection of normal saline solution in patients with GTPS. It is important to note that the injection of saline for trochanteric bursitis is not truly a sham procedure (relief may be due to washout of inflammatory mediators).

Extra-trochanteric bursa injections

Needle manipulation with or without injectate injection or aspiration is one of the treatment options for GTPS. In one study, the diagnosis of GTPS was the presence of pain ‘anywhere from the iliac crest to the mid-iliotibial band.’¹⁶¹ This RCT of CSI (80 mg MPA in 8 mL local anesthetic into the point of maximal tenderness in the greater trochanter) versus dry needling in patients with GTPS showed non-inferiority of dry needling for pain and function scores at 6 weeks.¹⁶¹ In this study, the site of dry needling was determined by the therapist but usually involved trigger points in the gluteus maximus/medius/minimus, piriformis, or tensor fascia lata.¹⁶¹ Another RCT showed that the efficacy of USG CSI (80 mg MPA in 7 mL local anesthetic) and extracorporeal shock wave therapy were similar at 3 months, with shock wave therapy being more effective at 12 months.¹⁶² In this study, the inclusion criteria were characteristic of trochanteric bursitis, but the injection was made into the ‘target bursae and tendon insertions.’

A recent systematic review and meta-analysis compared CSI with PRP.¹³⁶ In the review, studies included both greater trochanteric bursitis and gluteus tendinopathy, and the specific site of injection was not noted in one study. The authors concluded that CSI and PRP are useful options in GTPS and that the superiority of one over the other is not clear.

Gluteus medius/minimus tendon injection

An RCT demonstrated that a USG intratendinous injection of PRP produced significantly better outcomes (pain and function) than CSI at their 12-week follow-up.¹⁶³ Celestone chronodose in saline was injected into the ‘affected tendon’ under US. At 12 weeks follow-up, PRP gave better results (Harris hip score, minimally important clinical difference) than CSI. To determine the duration of pain relief, a study by the same investigators demonstrated that USG intratendinous PRP injections produced sustained clinical outcomes at 2 years, whereas the improvement from CSI was maximal at 6 weeks and was not maintained beyond 24 weeks.¹⁶⁴