Systematic Review

Outcomes of Open Versus Endoscopic Repair of Abductor Muscle Tears of the Hip: A Systematic Review

Sivashankar Chandrasekaran, M.B.B.S., F.R.A.C.S., Parth Lodhia, M.D., F.R.C.S.C., Chengcheng Gui, B.S.E., S. Pavan Vemula, M.A., Timothy J. Martin, M.A., and Benjamin G. Domb, M.D.

Purpose: To compare the outcome of open versus endoscopic gluteal tendon repair. **Methods:** An extensive review of PubMed was conducted by 2 independent reviewers for articles containing at least 1 of the following search terms: gluteus medius, gluteus medius tear, gluteus medius tendinopathy, gluteus medius repair, hip abductors, hip abductor tears, hip abductor repair, hip rotator cuff, hip rotator cuff repair, trochanteric bursa, trochanteric bursitis, trochanteric bursectomy, peritrochanteric procedures, peritrochanteric repair, and peritrochanteric arthroscopy. This yielded 313 articles. Of these articles, 7 satisfied the following inclusion criteria: description of an open or endoscopic gluteal repair with outcomes consisting of patient-reported outcome scores, patient satisfaction, strength scores, pain scores, and complications. **Results:** Three studies on open gluteal repairs and 4 on endoscopic gluteal repairs met the inclusion criteria. In total, there were 127 patients who underwent open procedures and 40 patients who underwent endoscopic procedures. Of the 40 patients who underwent endoscopic procedures, 15 had concomitant intra-articular procedures documented, as compared with 0 in the open group. The modified Harris Hip Score was common to 1 study on open repairs and 3 studies on endoscopic repairs. The scores were similar for follow-up periods of 1 and 2 years. Visual analog pain scale scores were reported in 1 study on open gluteal repairs and 1 study on endoscopic repairs and were similar between the 2 studies. Improvement in abductor strength was also similarly reported in selected studies between the 2 groups. The only difference between the 2 groups was the reported incidence of complications, which was higher in the open group. **Conclusions:** Open and endoscopic gluteal repairs have similar patient-reported outcome scores, pain scores, and improvement in abduction strength. Open techniques have a higher reported complication rate. Randomized studies of sufficient numbers of patients are required to ultimately determine if one technique produces superior patient outcomes over the other. **Level of Evidence:** Level IV, systematic review of Level IV studies.

See commentary on page 2068

Bunker[1] recognized gluteus medius and minimus tears as a cause of lateral thigh pain and abductor weakness, describing the pathology as "rotator cuff tears of the hip." Gluteal tears may be classified as either spontaneous or traumatic.[2] Spontaneous tears are associated with age, with the incidence peaking between the fourth and sixth decades.[3] They occur 4 times more frequently in women than in men, but the incidence increases at a similar rate in both groups. Most patients with spontaneous degenerative tears present with an insidious onset of lateral-sided hip pain that is aggravated by weight bearing.[4] In contrast, patients with traumatic tears can often pinpoint the exact time symptoms began to occur. On examination, there is often tenderness over the greater trochanter with a reduction in power on resisted hip abduction.[5] Peritrochanteric injections typically relieve the pain, but weakness still persists.[6]

Tears can be classified morphologically as intrasubstance (occurring in line with the tendon fibers),

From American Hip Institute (S.C., P.L., C.G., S.P.V., T.J.M., B.G.D.), Westmont; Hinsdale Orthopaedics (B.G.D.), Westmont; and Loyola University Chicago Stritch School of Medicine (B.G.D.), Chicago, Illinois, U.S.A.

The authors report the following potential conflict of interest or source of funding: B.G.D. receives support from Arthrex, MAKO Surgical, Pacira, Breg, and ATI. B.G.D owns stock inStryker and receives royalties from Orthomerica and DJO Global.

Received January 6, 2015; accepted March 24, 2015.

Address correspondence to Benjamin G. Domb, M.D., Hinsdale Orthopaedics, 1010 Executive Ct, Ste 250, Westmont, IL 60559, U.S.A. E-mail: DrDomb@americanhipinstitute.org

0749-8063/1521/$36.00

http://dx.doi.org/10.1016/j.arthro.2015.03.042

partial thickness, or full thickness.[7] Magnetic resonance imaging (MRI) can help differentiate between partial- and full-thickness tears and show fatty atrophy within the muscle.[4] Tendinosis is included in the differential diagnosis of gluteal tears and will appear on MRI as increased signal intensity on T2-weighted images. A partial-thickness tear is diagnosed when the tendon is thickened and there is increased signal intensity on T2-weighted and short inversion time recovery images. Focal discontinuity of the tendon with tendon retraction represents a complete tear.

In spontaneous tears, nonoperative management is often prescribed in the first instance. This consists of a combination of physical therapy, functional adjustment, and medications.[8] Medications may include nonsteroidal anti-inflammatories, steroid injections, and newer medical therapies, such as plasma rich in platelets, autologous blood, and high-volume saline solution injections. However, there is minimal high-level evidence to support the routine use of the latter therapies.[9]

Operative management is advocated for appropriate patients who have not achieved adequate pain relief with nonoperative management. The aim of surgical intervention is to restore the footprint and promote tendon-to-bone healing.[10,11] Traditionally, this was performed through an open approach because this allowed visualization of the footprint, preparation of bone surfaces, and fixation of tendon to bone.[12-14] However, with advancements in endoscopic instruments and techniques, there has been a recent increase in the prevalence of endoscopic repairs.[15-18] The aim of this systematic review was to compare the outcomes of open versus endoscopic gluteal repairs and provide an algorithm regarding the indications and benefits for each approach.

Methods

Two independent reviewers (S.C., P.L.) performed an extensive search of PubMed for articles that contained at least 1 of the following search terms: gluteus medius, gluteus medius tear, gluteus medius tendinopathy, gluteus medius repair, hip abductors, hip abductor tears, hip abductor repair, hip rotator cuff, hip rotator cuff repair, trochanteric bursa, trochanteric bursitis, trochanteric bursectomy, peritrochanteric procedures, peritrochanteric repair, and peritrochanteric arthroscopy. The search included articles published from January 1930 to September 2014. Reference lists from relevant articles were also reviewed to identify any additional studies of interest. The search revealed 313 articles. Of these, 251 were excluded after title and abstract review, whereas 62 full-text publications were reviewed. Seven of these articles met our inclusion criteria (Fig 1): human studies, articles written in English or abstracts in English, case series of more than 2 patients treated with either an open or endoscopic technique of gluteal tendon repair, and studies reporting on patient outcomes (Appendix Table 1, available at www.arthroscopyjournal.org). Articles were excluded if they were review articles, technique articles, case reports, or nonoperative studies or if they reported on the outcomes of repair in the setting of hip arthroplasty (Appendix Table 1, available at www.arthroscopyjournal.org).

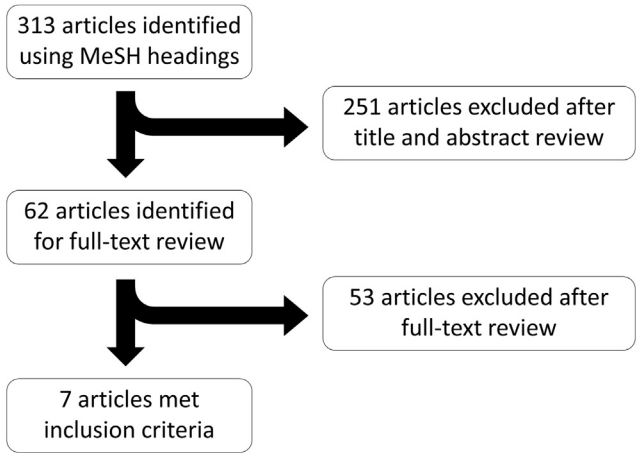

Fig 1. Selection procedure yielding 7 articles for review. (MeSH, Medical Subject Headings.)

Results

By use of the aforementioned search criteria, 7 articles ultimately met the appropriate criteria for inclusion in this review. There were 3 studies on outcomes of open gluteal repairs and 4 on endoscopic repairs. A meta-analysis could not be performed because of the heterogeneity of patient cohorts in each study and the outcomes reported. The review will analyze and discuss these articles in terms of patient demographic data and operative indications, repair techniques, classification of tears, outcomes, and complications.

Patient Demographic Data and Indications

Open Gluteal Repair. Table 1 summarizes the patient demographic data for the 3 outcome studies on open gluteal repairs. Walsh et al.[14] did not report on the male-to-female ratio, but the mean age of the female patients was slightly younger, at 62 years, compared with 65 years for male patients. Table 2 summarizes the clinical features of each of the cohorts that underwent an open gluteal repair. All 3 cohorts presented with lateral hip pain. Walsh et al. reported that in their cohort, 32 patients had a normal gait, 58 had a positive Trendelenburg sign, and 10 were immobile with pain. In contrast, Davies et al.[13] reported that 100% of their cohort had a positive