

Incidental “Rotator Cuff Tear of the Hip” at Primary Total Hip Arthroplasty

Hal E. Cates, MD, Monica A. Schmidt, PhD, and Rachael M. Person

Abstract

Gluteus medius tendon tears are occasionally noted during primary total hip arthroplasty. In this study, we reviewed the cases of 513 total hip arthroplasty patients to determine the incidence of these tears and to report clinical outcomes. We found 8 patients (8 hips) with incidental gluteus medius tendon tears for an incidence of 1.6%. After surgical repair, no patient had a perceptible limp or a Trendelenburg sign postoperatively.

Total hip arthroplasty (THA) remains the gold standard of treatment for end-stage hip osteoarthritis. Although most patients experience effective restoration of function after surgery, impaired musculature can significantly hinder the functional outcome of this procedure. It is well known that an abductor deficiency can result in a chronic limp referred to as a *Trendelenburg gait*.

Descriptions of the similarity of hip and shoulder problems began with Stegemann in 1923.¹ Other authors have theorized that gluteus medius tendon degeneration could result from calcifications, mechanical irritation, or degeneration in vascular watershed areas.² Recently, Bunker and colleagues³ identified a “rotator cuff tear of the hip” in patients undergoing hip replacement and hemiarthroplasty for acute fractures of the femoral neck. They reported a 22% incidence of this lesion and described preoperative radiographic changes that might predict the finding of this particular lesion. Howell and colleagues⁴ reported a 20% incidence of gluteus medius tendon pathology at time of THA in a prospective series and described localization of the lesion at the anterior intertrochanteric line.

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Both of these studies used an anterior-lateral or Hardinge approach to the hip. There are no reports of incidence of this lesion as visualized from the posterior-lateral approach. In the present study, we reviewed THAs performed between June 2003 and December 2006 to determine the incidence of “rotator cuff tears of the hip” and to report the clinical outcomes after repair.

METHODS AND MATERIALS

We reviewed the operative data sheets and dictated reports for 513 patients who had undergone primary THA between June 2003 and December 2006. All these surgeries were performed by the senior author. The presence of a gluteus medius tendon tear was carefully documented. Data collection was conducted with approval of the Covenant Health

“Repairing the torn tendon intraoperatively possibly prevented further tendon avulsion.”

Institutional Review Board (2007-0202). During surgery, 8 patients (8 hips) were found to have an insertional tear of the gluteus medius. These 8 patients’ radiographs and clinical records were reviewed. Preoperative radiographs were examined for the radiographic predictors described by Bunker and colleagues.³ After surgery, patients were evaluated as to presence or absence of a limp or a Trendelenburg sign.

Surgical Technique

A posterior-lateral approach to the hip was used in all cases. Observation of the musculature was undertaken. If an incidental gluteus medius tendon tear was identified, it was débrided and repaired at the end of the procedure. The primary THA was undertaken per routine.

When defects were found during surgery, the trochanteric bone in the defect area was roughened, and primary repair of the tendon(s) was undertaken with nonabsorbable suture, if possible. When the defect was too large for primary repair, additional fixation with suture anchors in the greater trochanter was used in an attempt to secure the tendon in its shortened position. In some cases, suture anchors were used for additional fixation when direct repair was possible but tenuous (Figure).

After surgery, patients were treated identically with weight bearing to tolerance, deep-vein thrombosis prophylaxis with

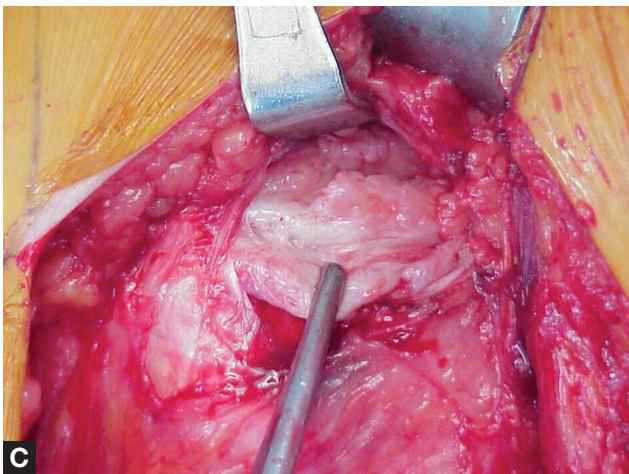
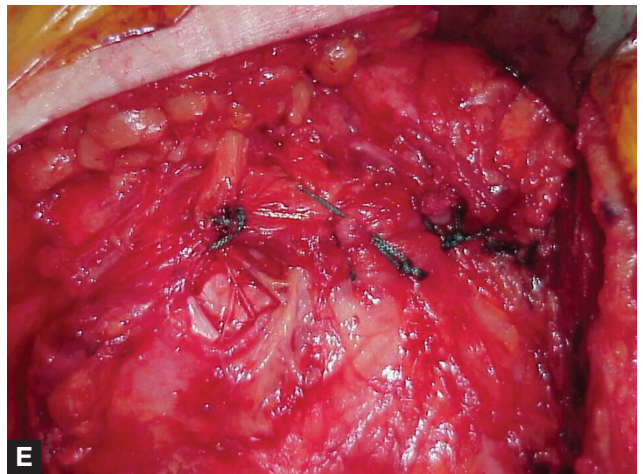
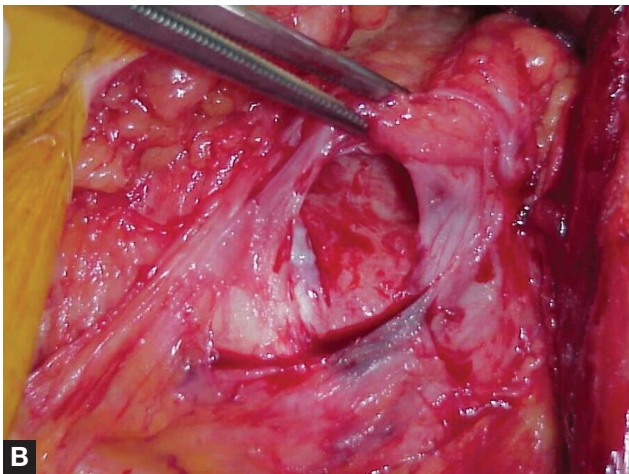
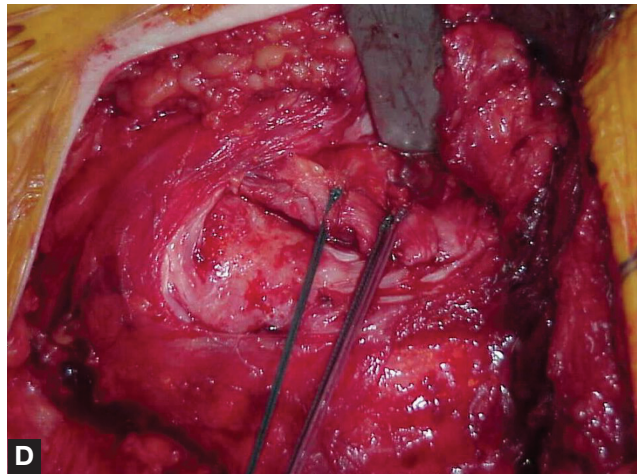
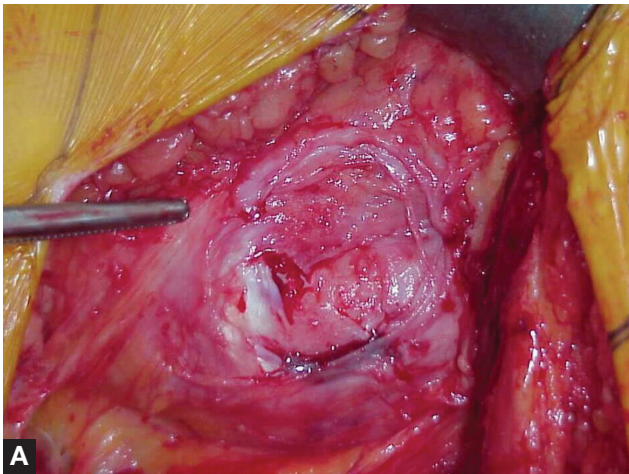


Figure. (A) Gluteus medius tendon tear with exposed greater trochanteric bone. (B) Appearance after tendon débridement and burring of trochanteric bone. (C) Mobilization of gluteus medius tendon edge. (D) Suture anchor placement through gluteus medius tendon. (E) Final appearance, after additional direct suturing of tendon edges.

warfarin, physical therapy, and walker or crutch ambulation for 4 weeks. In addition, patients who had undergone gluteus medius tendon repair were restricted from active abduction for 4 weeks, after which active abduction exercises were undertaken.

RESULTS

Gluteus medius tendon tears were found in 8 (1.6%) of 513 hips. Of the 8 patients, 2 were men (mean age, 72.5 years; SD, 3.5 years), and 6 were women (mean age, 74.2 years; SD, 6.6 years). Mean age of both men and women with the tendon tear was 73.8 years (SD, 5.8 years).

Preoperative radiographs revealed suggestive bony excrescences in a majority of these 8 patients. Seven (87.5%) of the patients were found to have these lesions suggestive of a gluteus medius tear, 5 (62.5%) had a sclerotic margin, 7 (87.5%) had ridges and, in some cases, osteophytes on the hip of the affected side, and 2 (25%) had trochanteric cysts.

All gluteus medius and minimus muscle tears were repaired. Five of the 8 hips allowed direct repair, but 3 of the 8 hips had to be secured with suture anchors in a shortened position into the trochanteric bone.

After surgery, none of the 8 patients who required gluteus medius muscle repair had a perceptible limp. Also, the Trendelenburg sign was negative in all 8 patients.

DISCUSSION

The low rate of gluteus medius tendon tears recorded during primary THA, 1.6%, is considerably lower than the 22% reported by Bunker and colleagues³ and the 20% reported by Howell and colleagues.⁴ Our finding could be explained by

numerous contributing factors, including patient demographics, geographic location, ethnic descent, tendon pathology, and metabolic conditions. Although it might be argued that the decreased visibility of the posterior-lateral approach could reduce ability to identify minor tears, we believe that appropriate detection was obtained through routine intraoperative range-of-motion assessment.

Etiology of the gluteus medius tendon tear remains unclear. One factor might be tendon impingement caused by undersurface trochanteric bony overgrowth. Another consideration is lateral degenerative wear from fascial friction. Only further research can complete our understanding of gluteus medius tears.

Findings from preoperative radiographs were associated with gluteus medius tendon tears in the majority (87.5%) of these patients. It is uncertain whether these bony overgrowths are potentially causative of the tear or only represent bone changes as a response to the chronic tearing. One weakness in the radiographic findings is that there was no control group.

Kagan¹ reported 7 cases of gluteus medius tendon repairs in patients who underwent surgery for recalcitrant trochanteric bursitis. Preoperative radiographs were normal, but magnetic resonance imaging abnormalities were found in most patients. Kagan did not report the details of his evaluation of plain radiographs or the size of the tendon tears. Bunker and colleagues³ found preoperative radiographic features in 6 (55%) of 11 patients with tendon tears observed during surgery for repair of femoral neck fractures. Radiographic findings were related to size of tendon tears, being observed for all patients with tears 2 to 3 cm in size and not observed for interstitial tears. The present study only included patients who underwent primary THA, so clinical symptoms and tendon tears were expected to be more advanced than for patients with femoral neck fractures. Thus, finding bony excrescences in 87.5% of the patients with tendon tears was not unexpected.

After surgery, no patient had a perceptible limp or a Trendelenburg sign. It is unknown whether the gluteus medius tendon repair was independently successful or whether the residual intact abductor musculature functions to prevent a limp or reduce the likelihood of a positive Trendelenburg sign.

When suture anchors are used as an adjunct for abductor repair, a potential complication is osteolysis of the greater trochanter, as reported by Harwin.⁵ Harwin found an 8.4%

rate of anchor migration, a 3.7% rate of progressive osteolysis of the greater trochanter, and a pathologic greater trochanteric fracture in 0.5% of 214 consecutive patients using a direct lateral approach. When possible, direct suturing of the gluteus medius tendon was performed in this group, and suture anchors were added only to a tenuous repair or when the gluteus medius tendon was shortened (ie, when it was used to secure the gluteus medius tendon in the shortened position). Although, theoretically, the risk for trochanter bursitis could increase given the retained sutures and possible suture anchor pull-out, this has not been observed. We saw no osteolysis in our patient group, but the follow-up was relatively short.

In this study, the incidence of "rotator cuff tears of the hip" was small. Clinical results suggest that normal gait can be expected in patients found to have a gluteus medius tendon tear that has been repaired at the time of the index arthroplasty. Repairing the torn tendon intraoperatively possibly prevented further tendon avulsion. In addition, these patients demonstrated a normal gait and a negative Trendelenburg sign, implying that the gluteus medius tendon was clinically functioning normally. We continue to repair incidental gluteus medius tendon tears during primary THA.

AUTHORS' DISCLOSURE STATEMENT

Dr. Cates wishes to note that he has consulting agreements with Zimmer and Biomet, manufacturers of total hip implants. Dr. Cates and Dr. Schmidt wish to note that they have received research grants from Zimmer and Biomet, but not to support this research study. Ms. Person reports no actual or potential conflict of interest in relation to this article.

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