Endoscopic Gluteus Medius Repair With an ITB-Sparing Versus ITB-Splitting Approach

A Systematic Review and Meta-analysis

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Background: During hip endoscopy, the iliotibial band (ITB) can be split or preserved to access the peritrochanteric workspace. To our knowledge, no comparative studies have been performed to analyze patient-reported outcomes (PROs) and surgical failure rates (gluteus medius retear and/or revision surgery rates) for ITB-sparing versus ITB-splitting approaches in endoscopic gluteus medius repairs.

Purpose: To perform a systematic review and meta-analysis of the literature to evaluate PROs and failure rates of patients undergoing ITB-sparing versus ITB-splitting repairs of the gluteus medius.

Study Design: Systematic review; Level of evidence, 4.

Methods: A systematic review was performed by following PRISMA (Preferred Reporting Items for Systematic Meta-Analyses) guidelines and using the PubMed, Cochrane CENTRAL, and Embase databases. The quality of evidence was evaluated using the modified Coleman Methodology Score. Level 1-4 studies were evaluated for endoscopic abductor repair techniques on all types of gluteus medius tears. Given the small number of studies and varying population sizes, all quantitative data were adjusted for study population size.

Results: A total of 13 studies met our inclusion criteria, while more granular data, including ITB approach, were available for 8 studies. Because of the paucity of literature on the subject, all included studies were of lower quality per the modified Coleman Methodology Score. The visual analog scale for pain, the modified Harris Hip Score (mHHS), and the surgical failure rates were compared between approaches. Patients who underwent ITB splitting had a significantly greater change in mHHS (45.5 ± 4.6 vs 27.3 ± 6.5; $P < .001$) and lower surgical failure rates (3.67 ± 2.33 vs 4.75 ± 2.54; $P = .04$). There was no significant difference in change in visual analog scale for splitting versus sparing (4.26 ± 0.41 vs 4.39 ± 0.14; $P = .96$). The results may have been biased by between-group differences, such as patients who undergo ITB sparing being significantly younger.

Conclusion: Endoscopic gluteus medius repair is a reliable procedure to improve pain and function in appropriately selected patients. This study highlighted the lack of high-quality literature available regarding ITB approach. However, the evidence to date has suggested that ITB approach may influence hip-specific PROs. Splitting the ITB during abductor repair may be associated with a greater improvement in mHHS and lower surgical failure rates. Further prospective comparative studies are warranted to evaluate the effect of ITB approach.

Keywords: gluteus medius; endoscopic; arthroscopic; ITB; iliotibial band; repair; greater trochanteric pain syndrome; postoperative; surgical failure; PRO; patient-reported outcome

Greater trochanteric pain syndrome (GTPS) is a prevalent but loosely defined set of symptoms, diagnosed in approximately 1.8 per 1000 patients.[8] These patients report persistent pain in the lateral hip and may demonstrate weak or painful hip abduction.[10,14,19] Full- and partial-thickness tears of the gluteus medius are increasingly being reported as an underdiagnosed cause of this recalcitrant hip pain.[10,13,14,19] If left untreated, these tears can progressively worsen, cause chronic hip pain and weakness, and affect the gait of the patient.[9] Patients with gluteus medius tears and 6 months of unsuccessful conservative therapy may be considered candidates for surgical repair.[7,19]

The Orthopaedic Journal of Sports Medicine, 8(5), 2325967120922196
DOI: 10.1177/2325967120922196

These patients are more likely to have gait deviation and decreased power on resisted abduction testing.[7] In a systematic review, Alpaugh et al[1] found that abductor repairs consistently improve functional status and patient-reported pain.

Literature has demonstrated that open and endoscopic approaches for gluteus medius repairs have similar patient-reported outcomes (PROs), functional improvements, and pain reductions.[1,6,16] Lower complication rates have been detailed for the endoscopic approach, with systematic reviews by Alpaugh et al[1] and Chandrasekaran et al[6] and a study by McCormick et al[15] yielding a 0% complication rate.

During endoscopy, the iliotibial band (ITB) overlying the deep gluteal musculature affects the amount of space available for viewing and correcting peritrochanteric pathology.[15] With the ITB-splitting surgical approach, the ITB is incised or windowed to allow access to the deeper bursal tissue and muscle fibers.[9,10] The ITB-sparing surgical approach utilizes portals anterior and posterior to the ITB, thus "sparing" the tissue to access the peritrochanteric workspace.[3] The complication rate of open repairs in the comparison studies was documented to be as high as 17%.[1,6,15]

This systematic review and meta-analysis compared the postoperative outcomes of patients who underwent ITB-sparing versus ITB-splitting endoscopic gluteus medius repairs. We assessed postoperative outcomes via PROs and surgical failure rates (gluteus medius retear and/or revision surgery). We hypothesized that (1) the ITB-splitting approach would have postoperative PROs equivalent to those of the ITB-sparing approach and that (2) the ITB-splitting approach would have a lower surgical failure rate.

METHODS

Literature Search

Search strategies were developed with the assistance of an orthopaedic health sciences librarian with expertise in searching for systematic reviews. Searches were developed by the authors and the librarian using an iterative process of gathering and evaluating terms. Searches were finalized in June 2019. Comprehensive strategies, including index and keyword terms, were devised for the following databases: PubMed (including MEDLINE), Embase (Elsevier platform), and Cochrane CENTRAL (Wiley). To maximize sensitivity, pre-established database filters other than the English-language filter were not used. The full PubMed search strategy was adapted for use with the other electronic databases. Complete search strategies are available upon request. Supplementary approaches for searching included reviewing reference lists and citing articles of relevant studies via SCOPUS searches for the included studies.

In the PubMed Search strategy, the MeSH terms and text words used to identify hip injuries (search 1) included the following:

("Hip Injuries"[Mesh] OR "Buttocks"[Mesh] OR "Femur"[Mesh]) AND ("Lacerations"[Mesh] OR "Tendon Injuries"[Mesh] OR "Tendons/injuries"[Mesh] OR "Pain"[Mesh]) OR (gluteus medius tear*[Text Word] OR gluteus medius injur*[Text Word] OR gluteal tear*[Text Word] OR gluteal injur*[Text Word] OR gluteal tendinopath*[Text Word] OR hip abductor tear*[Text Word] OR hip abductor lesion*[Text Word] OR gluteus medius defect*[Text Word] OR trochanteric pain syndrome*[Text Word] OR greater trochanter* pain[Text Word]).

The MeSH terms and text words used to identify endoscopic repair and ITB approach (search 2) were as follows:

("Endoscopy"[Mesh] OR "Minimally Invasive Surgical Procedures"[Mesh] OR "Suture Anchors"[Mesh]) OR "Suture Techniques"[Mesh] OR (endoscop*[Text Word] OR arthroscop*[Text Word] OR repair*[Text Word] OR minimally invasive[Text Word] OR minimal surgical[Text Word] OR IT band[Text Word] OR iliotibial band[Text Word] OR ITB[Text Word] OR peritrochanteric approach[Text Word] OR minimal access[Text Word]).

We then combined these 2 searches, limited results to English language, and found a total of 467 articles on this database. Duplicates were removed by using an approach to ensure accuracy and prevent accidental loss of records. This process was facilitated by citation management software and supplemented by manual review of records.

Our initial search yielded 1799 results that were evaluated according to our inclusion and exclusion criteria (Table 1). We reviewed 38 full-text articles and found 8 studies that fully met our inclusion criteria and were assessed qualitatively and quantitatively (Figure 1). The target intervention of the included studies was endoscopic gluteus medius repair, and studies needed to specify whether an ITB-splitting or ITB-sparing operative approach was utilized.[3-5,10,16-18,20] If these data were not available in the text, the corresponding authors were

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Final revision submitted January 13, 2020; accepted February 12, 2020.

One or more of the authors has declared the following potential conflict of interest or source of funding: J.R.L. has received consulting fees from Smith & Nephew and Conmed Linvatec, royalties from ConMed Linvatec, and hospitality payments from Arthrex. R.W.W. has received research funding from Smith & Nephew, educational support from Arthrex, and hospitality payments from Arthrex and Medical Device Business Services. AOSSM checks author disclosures against the Open Payments Database (OPD). AOSSM has not conducted an independent investigation on the OPD and disclaims any liability or responsibility relating thereto.

TABLE 1
Inclusion and Exclusion Criteria for Endoscopic Gluteus Medius Repair Studies

Inclusion	Exclusion
• Adults only	• Non–English language studies
• Levels 1-4, conference papers	• Animal studies
• All publication dates	• Studies of minors
• Acute and degenerative gluteus medius tears; partial and complete thickness	• Studies of patients with rheumatic conditions
• Avulsion-related gluteus medius tears	• Level 5 studies
• Patient-reported outcomes and/or reoperation rates reported	• Systematic reviews
• Minimum follow-up approximately 2 y	• Meta-analyses
• May include patients with prior hip arthroscopy, prior gluteus medius repair (open or endoscopic), prior trochanteric bursectomy, prior iliotibial band procedures, prior hip arthroplasty	• Commentaries
• May have concomitant extra-articular procedures, hip arthroscopy	• Technique descriptions

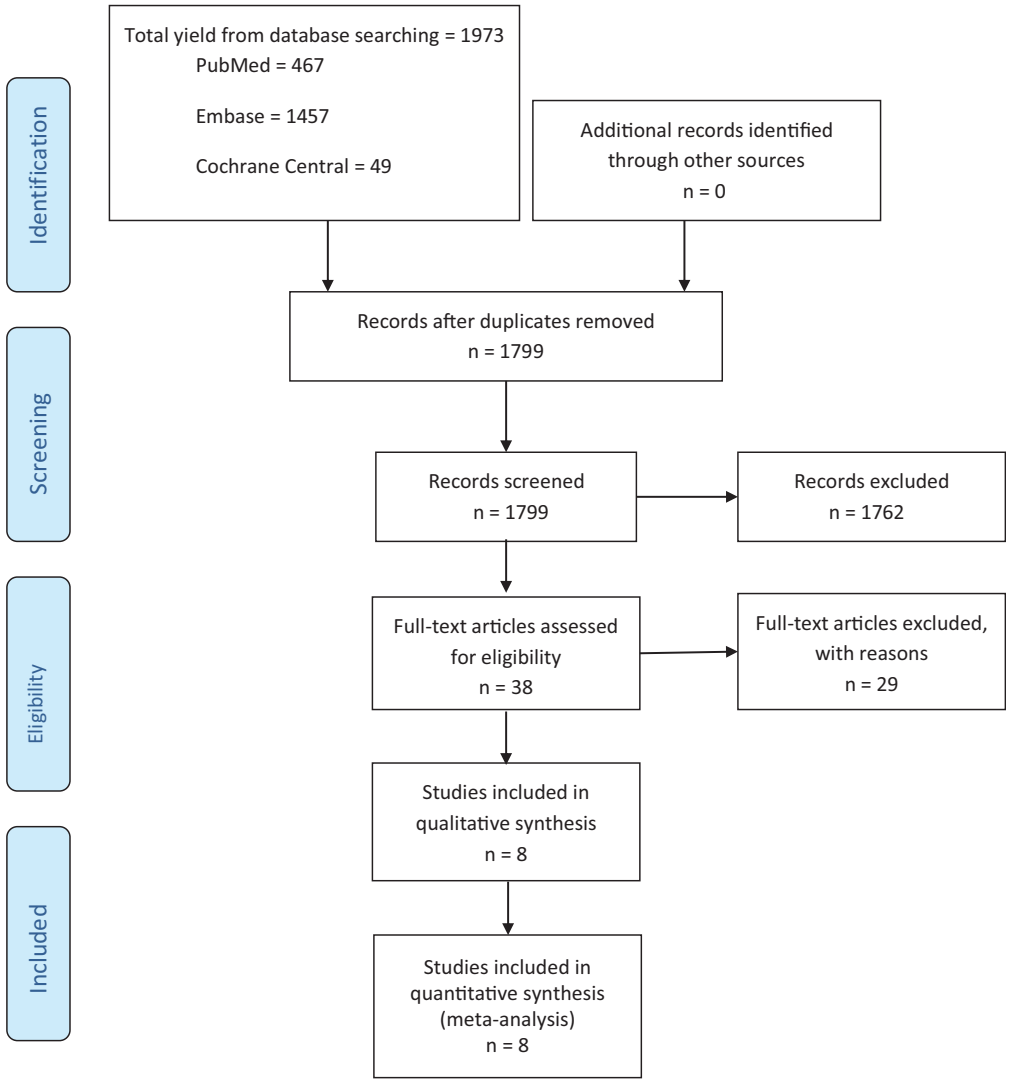

Figure 1. PRISMA (Preferred Reporting Items for Systematic Meta-Analyses) flow diagram of included and excluded studies of endoscopic gluteus medius repair, with iliotibial band approach specified.

contacted to verify the ITB approach employed during surgery. If the corresponding authors did not respond, these studies were excluded per our criterion requiring specification of operative approach. The studies also needed to have quantifiable postoperative PROs or surgical failure rates available for analysis.[3-5,10,16-18,20]

Statistical Analysis

Given the relatively small number of included studies and the large differences in study population size, all quantitative results comparing ITB splitting versus ITB sparing were adjusted for population size. Additionally, there was data overlap in the 3 studies with ITB-splitting and ITB-sparing repairs because separate quantitative variables were not given for the different populations.[3,5,20] Therefore, adjusting the data by population size was performed to reduce inaccuracies due to overlap.

Excel (v 1808; Microsoft Inc) was utilized to perform basic comparisons of patient characteristics and all Student *t* tests. Student *t* tests were performed to compare descriptive data between patients undergoing ITB splitting and those undergoing ITB sparing; mean age, mean percentage of female patients, and mean follow-up were analyzed. Additionally, Student *t* tests were used to assess quantifiable study outcome variables, such as preoperative visual analog scale (VAS) for pain, postoperative VAS, decrease in post- versus preoperative VAS, preoperative modified Harris Hip Score (mHHS) for hip function, postoperative mHHS, difference in post- versus preoperative mHHS (ΔmHHS), and surgical failure rates for ITB splitting versus ITB sparing. To evaluate qualitative operative variables, SPSS (v 25; IBM) was utilized; these results were not adjusted for patient population size. Given the amount of variation in concomitant and prior hip procedures performed, these variables were standardized to evaluate their presence or absence in the patients of the study, with 1 = yes and 0 = no. Pearson chi-square tests were performed to compare the presence or absence of concomitant extra-articular procedures and/or concomitant intra-articular procedures and/or prior ipsilateral hip procedures in patients undergoing ITB splitting versus those undergoing ITB sparing. Fisher exact tests were performed if the numerical inputs were not large enough to support performing a Pearson chi-square analysis. In the 3 studies[3,5,20] with ITB-splitting and ITB-sparing repairs, there was no data overlap for the qualitative variables, so data overlap did not affect these results.

Outcome Variables

The primary outcome variable of this study was the surgical outcomes of patients undergoing endoscopic gluteus medius repair with an ITB-sparing versus ITB-splitting approach. Surgical outcomes were evaluated using postoperative PROs, overall rate of surgical failure (gluteus medius retear or revision surgery), and individual numbers of confirmed retears or revision surgery cases.

The extent of postoperative PRO score improvement after endoscopic gluteus medius repair was examined among patients who underwent ITB splitting versus sparing. All 8 studies collected pre- and postoperative PRO data from their patients but differed widely in which specific PROs were collected and whether the numerical PRO scores were reported in the study.[3-5,10,16-18,20] The most data points were available to compare ITB splitting versus ITB sparing for mHHS and VAS. Postoperative PRO score improvement was defined as a significant increase in mHHS and a significant decrease in VAS.[3-5,10,17,18,20] Therefore, we analyzed the ΔmHHS (the difference between post- and preoperative mHHS) as well as the ΔVAS (the difference between pre- and postoperative VAS).

Surgical failure was also examined and could be defined as a radiographically confirmed gluteus medius retear or as gluteus medius revision surgery; the number of cases of confirmed retears and revision surgery were assessed individually in addition to composite surgical failure rates. Seven studies reported surgical failure rates,[3,4,10,16-18,20] with 4 of the 8 included studies having cases of failure occur. Two studies[17,18] defined surgical failure as a gluteus medius retear confirmed using magnetic resonance imaging (MRI) scan, and 2 studies[3,16] defined surgical failure as a documented revision repair of the gluteus medius.

Study Quality

The mean modified Coleman Methodology Score (Appendix Tables A1 and A2) was assessed by 2 independent reviewers (E.A.P., A.M.M.). For the 8 evaluated studies, the median score was 32 (range, 18-39). Scores were similar among studies using the ITB-splitting approach versus the ITB-sparing approach versus both approaches. All study scores were <55, which is considered "poor quality," owing to small study size, lower-quality study type, and multiple interventions per group. These scores were expected because of the relatively new nature of the surgical intervention in question and the paucity of literature available.

RESULTS

In the group of 8 evaluated studies, the median sample size was 19 patients, with a range of 7 to 43. Of these 8 studies, 2 used the ITB-splitting approach,[10,18] 3 used the ITB-sparing approach,[4,16,17] and the remaining 3 utilized both approaches.[3,5,20] In total, 141 ITB-sparing and 33 ITB-splitting repairs were available for analysis (Tables 2 and 3). The mean ± SD age of the ITB-sparing group was 58.43 ± 4.26 years, which differed from the mean age of the ITB-splitting group (64.11 ± 3.84 years; $P < .01$). The mean percentage of female patients was different between patients undergoing ITB sparing and those undergoing ITB splitting, at 92.38% ± 4.98% versus 86.40% ± 3.64% ($P < .01$), respectively. The mean follow-up was 29.72 ± 5.08 months for ITB sparing and 28.33 ± 4.88 months for ITB splitting, which was not significantly different ($P = .16$).

Operative variables were assessed between the ITB-splitting and ITB-sparing populations. There was a large amount of variance in the concomitant and prior hip procedures allowed for the included studies, so the analysis was standardized to evaluate for the presence or absence of concomitant extra-articular ipsilateral procedures and/or concomitant intra-articular ipsilateral procedures and/or prior ipsilateral hip procedures. Nawabi et al[16] did not provide data on concomitant intra- or extra-articular procedures performed, and Bogunovic et al[3] did not provide data on

TABLE 2
Study Summary Table[a]

Author	No. of Patients (M:F)	Mean (Range)		ITB Splitting or Sparing	Postoperative PROs		Failure Rate, No. (%)	Summary
		Age, y	Follow-up, mo		Obtained	Scores		
Byrd[4]	12 (0:12)	56 (39-77)	24	12 sparing	mHHS, iHOT-12	mHHS, 85; iHOT-12, 73	0 (0)	Endoscopic ITB-sparing GM repair improves hip outcome scores with no incidence of complications
Nawabi[16]	18 (1:17)	51.6	38.1 (24-87)	18 sparing	mHHS, HOS-ADL, HOS-SS	Significant increase in mHHS, HOS-ADL, HOS-SS	2 (11.1)	Open and endoscopic GM repairs result in clinical improvement
Voos[20]	10 (2:8)	50.4 (33-66)	25 (19-38)	9 sparing, 1 splitting	mHHS, HOS	mHHS, 94 (84-100); HOS, 93 (85-100)	0 (0)	All patients had complete pain relief; improved mHHS, HOS, and strength; and no complications
Chandrasekaran[5]	34 (2:32)	57 (20-79)	24, minimum	30 sparing, 4 splitting	mHHS, NAHS, HOOS-ADL, HOOS-Sports, VAS	VAS, 2.4	Not obtained	Endoscopic GM surgical repair is effective with suture bridge or transtendinous technique
Bogunovic[3]	30 (3:27)	62.2 (36.7-88.5)	34.68	29 sparing, 1 splitting	HOS-ADL, HOS-SS, mHHS, VAS	HOS-ADL, 83.3; HOS-SS, 75.0; mHHS, 81.1; VAS, 1.68	2 (6.67)	The degree of muscle fatty atrophy negatively affects postoperative PRO scores and reoperation rates
Saltzman[17]	43[b]	62.1	29.31	43 sparing	HOS-ADL, HOS-SS, HHS, mHHS, SF12-PF, iHOT-12, VAS	HOS-ADL, 82.79 (53-100); HOS-SS, 72.31 (11.1-98.5); mHHS, 78.72 (41.8-100); VAS, 1.92	4[c]	PRFM had no effect on pain or retear rates and may improve hip physical function
Drummond[10]	7[b]	65 (26.7-88.6)	20.7 (5.3-41.2)	7 splitting	VAS, Oxford, iHOT-33	VAS, 2.8; Oxford, 37.3; iHOT-33, 70.2	0 (0)	ITB release, bursectomy, and GM repair are safe and effective for greater trochanteric pain
Thaunat[18]	20 (3:17)	66 (45-82)	31.7 (24-47)	20 splitting	mHHS, NAHS, VAS	mHHS, 80.2; NAHS 76.8 ± 14.5; VAS, 3.2	1 (5)	Endoscopic GM surgical repair is effective in the short term, but fatty degeneration can affect clinical outcomes

[a]ADL, activities of daily living; F, female; GM, gluteus medius; HOOS, Hip disability and Osteoarthritis Outcome Score; HOS, Hip Outcome Score; iHOT, International Hip Outcome Tool; ITB, iliotibial band; M, male; mHHS, modified Harris Hip Score; NAHS, Nonarthritic Hip Score; PRFM, platelet-rich fibrin matrix; PRO, patient-reported outcome; SF-12-PF, 12-Item Short Form Health Survey–Physical Functioning; SS, Sport Specific; VAS, visual analog scale for pain.
[b]No sex data available.
[c]No delineation between open and endoscopic.

prior ipsilateral hip procedures. The percentage of studies including patients with concomitant extra-articular procedures did not differ significantly between the ITB-sparing (75.61% ± 43.12%) and ITB-splitting (87.88% ± 33.14%) literature ($P < .01$). However, studies with ITB sparing were significantly more likely to include patients with concomitant intra-articular procedures (65.04% ± 47.88% vs 18.18% ± 39.17%, $P < .01$). Studies with ITB sparing also had a significantly greater inclusion of patients with prior procedures on the operative hip (65.18% ± 47.85% vs 0.00% ± 0.00%; $P < .01$).

PRO Measures

The study by Nawabi et al[16] did not provide numerical data on postoperative PROs. Six studies included pre- and

TABLE 3
Characteristics of Patients Undergoing Endoscopic Gluteus Medius Repair With ITB Sparing vs ITB Splitting[a]

	Mean ± SD		
ITB	Age, y	Female, %	Follow-up, mo
Sparing	58.43 ± 4.26	92.38 ± 4.98	29.72 ± 5.08
Splitting	64.11 ± 3.84	86.40 ± 3.64	28.33 ± 4.88
P value	<.01	<.01	.16

[a]ITB, iliotibial band.

postoperative VAS score data (Table 4).[3,5,10,17,18] Four studies[3,4,17,18] included pre- and postoperative mHHS score data, while Voos et al[20] provided only postoperative mHHS data. ITB splitting patients had higher pre- and postoperative VAS scores as compared with ITB sparing patients (preoperative, 7.22 ± 0.41 vs 6.48 ± 0.28 [$P < .01$]; postoperative, 2.97 ± 0.37 vs 2.09 ± 0.28 [$P < .01$]). However, there was not a significant difference in postoperative VAS improvement (ΔVAS) between ITB splitting patients and ITB sparing patients (4.26 ± 0.41 vs 4.39 ± 0.14; $P = .96$). For the mHHS, ITB splitting patients had lower preoperative scores (34.75 ± 4.78 vs 52.85 ± 4.51; $P < .01$) but not significantly different postoperative scores (80.87 ± 2.94 vs 81.49 ± 4.75; $P = .25$). There was a significantly greater degree of improvement in mHHS scores among ITB splitting patients (45.5 ± 4.6 vs 27.3 ± 6.5; $P < .001$).

Surgical Failure Rates

Of the 8 studies reviewed, only the study by Chandrasekaran et al[5] did not provide surgical failure data. Three studies documented zero cases of surgical failure within the 2-year follow-up period.[4,10,20] Of the remaining 4 studies, Bogunovic et al[3] and Nawabi et al[16] documented cases of revision procedures, while Saltzman et al[17] and Thaunat et al[18] documented retears confirmed using MRI on (Table 5). Saltzman et al had 4 cases of clinical retears confirmed using MRI on, but only 2 could be definitively attributed to endoscopic gluteus medius repairs, as this study also included open repairs. For this reason, the minimum retear rate (2 of 43, 4.65%) from the Saltzman et al study was included in the between-groups failure rate calculations, but the study data were not included in the Pearson chi-square calculations because the number of nontear cases could not be confirmed. The ITB-sparing group had 4 retears and 4 reoperations documented and 63 cases with no retear and no revision surgery confirmed. The ITB-splitting group had zero retears and 1 reoperation documented, 19 cases with no retear confirmed, and 28 cases with no reoperation confirmed. The Pearson chi-square results for retears and reoperations between the ITB-splitting and ITB-sparing groups were not significant. The mean surgical failure rate (retears and reoperations) was 4.75% ± 2.54% for ITB sparing versus 3.67% ± 2.33% for ITB splitting ($P = .04$).

DISCUSSION

This systematic review and meta-analysis evaluated the surgical outcomes of patients who underwent endoscopic gluteus medius repair via the ITB-sparing versus ITB-splitting approach. Overall, patients see substantial clinical benefits from gluteus medius repair regardless of surgical approach. The results from the limited pool of current literature suggested a small but statistically significant advantage with the ITB-splitting approach. ITB splitting resulted in a lower overall surgical failure rate while achieving the same functional outcomes according to the mHHS, despite the patient population having a significantly lower mHHS before surgery. This was demonstrated by the significantly higher ΔmHHS among ITB splitting patients. Patients undergoing ITB splitting had higher pre- and postoperative pain scores, but the improvement in pre- to postoperative VAS was not significantly different between ITB splitting and ITB sparing approaches. Demographically, patients undergoing the ITB-sparing approach were younger, with a greater percentage of female patients. They also more often underwent concomitant intra-articular hip procedures and were more likely to have had prior procedures on their operative hip, making reliable statistical comparisons of ITB splitting versus ITB sparing outcomes difficult.

The benefits of endoscopic gluteus medius repair regardless of ITB approach were detailed consistently in our review of the literature. In all 8 of our included studies, patients had significant improvements in pain, strength, and function after surgery.[3-5,10,16-18,20] Nawabi et al[16] were the only authors to compare open and endoscopic surgery, and they found similar improvements among all patients in mHHS, Hip Outcome Score–Activities of Daily Living, and Hip Outcome Score–Sports Specific subscale up to 3 years postoperatively. These results concur with findings by Alpaugh et al[1] and Chandrasekaran et al,[6] both of whom found that endoscopic gluteus medius repairs improve patient outcomes to the same extent as open repairs, with a lower incidence of complications.

Excess ITB friction, with subsequent greater trochanteric bursitis, was identified in the past as the main culprit of GTPS.[10,11] It is increasingly being recognized as only 1 of the multiple contributing factors for lateral hip pain, although it still plays an important biomechanical role in symptom resolution.[10,11] In some patients with recalcitrant lateral hip pain, an ITB release with or without a trochanteric bursectomy is adequate to resolve their symptoms, such as the patients described by Jain et al[11] and Zeman et al.[21] In these cases, pain may be caused by the ITB rubbing along the underlying tissues, with the friction creating painful inflammation.[10] However, addressing the ITB is only part of the problem for many patients with GTPS, as shown in a study by Coulomb et al,[8] in which patients with GTPS and confirmed partial-thickness gluteus medius tears underwent surgery involving ITB release, bursectomy, and debridement of the fraying gluteus medius. Of the 17 patients, 6 were unsatisfied, and many had only a moderate improvement in PROs and functional results.[8] Thus, releasing the ITB is an important component of addressing

TABLE 4
Patient-Reported Outcome Measures for Patients Undergoing ITB-Sparing vs ITB-Splitting Repairs[a]

	VAS			mHHS		
ITB	Preoperative	Postoperative	Δ	Preoperative	Postoperative	Δ
Sparing	6.48 ± 0.28	2.09 ± 0.28	4.39 ± 0.14	52.85 ± 4.51	81.49 ± 4.75	27.26 ± 6.50
Splitting	7.22 ± 0.41	2.97 ± 0.37	4.26 ± 0.41	34.75 ± 4.78	80.87 ± 2.94	45.50 ± 4.58
P value	<.01	<.01	.96	<.01	.25	<.001

[a]Values are presented as mean ± SD. ITB, iliotibial band; mHHS, modified Harris Hip Score; VAS, visual analog scale for pain.

TABLE 5
Surgical Failure Rates for Patients Undergoing ITB-Sparing vs ITB-Splitting Repairs[a]

ITB	Failure, Mean ± SD, %
Sparing	4.75 ± 2.54
Splitting	3.67 ± 2.33
P value	.04

[a]ITB, iliotibial band.

GTPS, but in patients with complex hip pathology, it does not have a high likelihood of consistently resolving the hip symptoms as an isolated procedure.[8] It should also be acknowledged that ITB release is not a wholly benign procedure, with one example being concerns about slowed return to performance after ITB release in athletic populations.[2]

In addition to addressing any pain that may be generated because of ITB friction, splitting the ITB during endoscopic gluteus medius reconstruction allows for direct access to deeper pathology and may provide an improved peritrochanteric workspace.[12] When discussing surgical challenges during gluteus medius reconstruction, Davies and Davies[9] advised caution on both ends of the spectrum: with small undersurface partial-thickness tears that are difficult to see and may require additional maneuvering, and with large tears that should be reinforced after the initial repair. A technical note by Laskovski and Urchek[12] discussed how opening the ITB before placing the hip in abduction allows for superior access, and our included ITB-splitting studies by Thaunat et al[18] and Drummond et al[10] both detailed how opening a window in the ITB allows clear access to the bursa and then to the underlying gluteal musculature. The lower surgical failure rate for ITB splitting found in this review may be attributed to an enlarged workspace, facilitating avoidance of the previously detailed pitfalls. However, the difference in failure rate between approaches was approximately 1%, and we cannot exclude bias, owing to the factors detailed in the Limitations section, such as a significant between-group difference in patients having undergone prior hip surgery.

Limitations

The predominant limitation of this study was the small pool of literature on this relatively new technique. Of the 38 full-text articles that were reviewed, 20 were excluded for being case reports, being technique descriptions, or utilizing only open repair techniques. The majority of our included studies were case series with multiple interventions within the same experimental group, which lowered the overall power of our study. Additionally, there was quantitative variable data overlap in our 3 studies with both ITB-splitting and ITB-sparing repairs. Patients were older in the ITB-splitting group and more commonly female in the ITB-sparing group; these can be confounding factors that influence PROs and reoperation rates.

We acknowledge that these limitations—lower-quality source literature, quantitative variable data overlap, potential within-group confounds—restrict the power of conclusions drawn from this systematic review and meta-analysis. However, this research does highlight the striking paucity of data on the subject of advantages and disadvantages to ITB-splitting versus ITB-sparing approaches for endoscopic gluteus medius repair. Additionally, the conclusions from this study can serve as a hypothesis-forming "starting point" for future research regarding this topic.

CONCLUSION

Endoscopic gluteus medius repair is a reliable procedure to improve pain and function in appropriately selected patients. This study highlighted the lack of high-quality literature available regarding ITB approach. However, the evidence to date has suggested that ITB approach may influence hip-specific PROs. Splitting the ITB during abductor repair may be associated with greater improvement in mHHS and lower surgical failure rates. Further prospective comparative studies are warranted to evaluate the effect of ITB approach.

ACKNOWLEDGMENT

The authors acknowledge Jennifer DeBerg, Hardin Library for the Health Sciences, University of Iowa, for her assistance in developing and executing the literature searches.

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APPENDIX

TABLE A1
Coleman Methodology Score

Part A
1. Study size (10)
2. Mean duration of follow-up (5)
3. Number of surgical procedures (10)
4. Type of study (15)
5. Diagnostic certainty (5)
6. Description of surgical procedure (5)
7. Description of postoperative rehabilitation (10)
Part B
1. Outcome measures (10)
2. Outcome assessment (15)
3. Selection process (15)
Total: 100 possible

TABLE A2
Consensus Modified Coleman Methodology Scores[a]

Criteria	Bogunovic[3]	Byrd[4]	Nawabi[16]	Saltzman[17]	Drummond[10]	Thaunat[18]	Voos[20]	Chandrasekaran[5]
Part A								
1. Study size—No. of patients	0	0	0	4	4	0	0	0
2. Mean follow-up	0	0	3	0	0	0	0	0
3. Percentage of patients with follow-up (radiographic and clinical)	5	5	5	5	0	5	5	0
4. Number of interventions per group	0	0	0	0	0	0	0	0
5. Type of study	0	0	0	0	0	0	0	0
6. Diagnostic certainty (diagnosis confirmed by defined PE findings or MRI)	5	5	0	5	5	5	5	0
7. Description of surgical technique	5	3	3	5	5	5	3	3
8. Description of postoperative rehabilitation	3	3	0	3	0	3	3	0
Part B								
1. Outcome criteria								
Outcome measures clearly defined	2	2	2	2	2	2	2	2
Timing of outcome assessment clear	2	2	2	2	2	2	2	2
Use of outcome criteria with reported good reliability	3	0	0	0	0	0	0	0
Use of outcome with good sensitivity	0	0	0	0	0	0	0	0
2. Procedure for reporting outcomes								
Subjects recruited	0	0	0	0	5	0	0	0
Independent investigator (radiographic, clinical)	0	0	0	0	0	0	0	0
Written assessment	3	3	3	3	3	3	3	3
Patient-centered data collected	3	3	3	3	3	3	3	3
3. Description of subject selection process								
Selection criteria reported and unbiased	5	5	5	5	5	5	5	5
Recruitment rate reported and $\geq$80%	0	0	0	0	0	0	0	0
Eligible subjects not included in the study satisfactorily accounted for	0	0	0	0	5	0	0	0
Total score	36	31	26	37	39	33	31	18

[a]MRI, magnetic resonance imaging; PE, physical examination.