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Is There a Role for Reinforcing Soft-Tissue Repairs or Flaps for Patients Who Have Abductor Deficiency?

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Is there a role for reinforcing soft-tissue repairs or flaps for patients who have abductor deficiency?

Response/Recommendation: Reinforcing soft-tissue repairs, either alone or in combination with muscle flaps, may provide mild to moderate improvement in clinical outcomes in patients who have abductor deficiency undergoing revision total hip arthroplasty (THA). Patients should be informed regarding persistent limping after surgery.

Level of Evidence: Limited.

Expert Vote: agree 87.4%, disagree 7.4%, abstain 5.2%.

Rationale

Abductor deficiency is a serious complication after total hip arthroplasty (THA). This complication can lead to limping, pain, instability, and the need for revision THA [1,2]. Abductor deficiency can also be seen in patients who have adverse local tissue reaction (ALTR) as a result of the release of cobalt and chromium ions from trunnionosis (corrosion of trunnion of the femoral stem when metal head reacts with titanium trunnion), metal on the metal-bearing surface, or metal ions from backside wear in a modular dual-mobility device [3,4].

A search was conducted using PubMed, Medline, and Cochrane Library, with keywords including "Hip arthroplasty," "abductor deficiency," "hip abductor repair," "revision hip arthroplasty" and including published studies by July 2024. The review focused on clinical outcomes and complications of soft tissue repair and flaps for abductor deficiency after THA. There were 58 studies identified, and 12 studies met the criteria and were included. No randomized controlled trials or meta-analyses were available on this topic.

Abductor deficiency after THA can be classified as early and chronic. In patients who have partial tear and detachment of abductor muscles, tenodesis of gluteus medius and gluteus minimus may be attempted. Repair is usually performed by creating bone tunnels and suturing the abductor mechanism to the bone using nonabsorbable sutures. Primary repair may be attempted during the early period, within the first 15 months following THA [5–7]. Lübbeke et al. utilized primary abductor mechanism repair in 19 patients. After an average of 4.8 years follow-up, 50% of patients had improvement in both limp and pain [5]. Miozzari et al. reported significant improvement in pain scores ($P = 0.002$) and Harris Hip Score ($P = 0.002$) in 12 patients

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who had an average 2.3-year follow-up, but they observed a 30% failure rate [6]. Similarly, Invaco et al. reported a 40% failure rate with 19 patients undergoing primary abductor mechanism repair [7].

In cases of chronic abductor insufficiency persisting for more than 15 months with preserved gluteus maximus function, gluteus maximus flap transfer, with or without tensor fascia lata (TFL) muscle transfer, may be considered as surgical options [8–14]. Whiteside et al. initially reported good to excellent outcomes using gluteus maximus flap transfer for abductor deficiency after THA [8,11]. However, later studies failed to reproduce similar outcomes, reporting a high rate of positive Trendelenburg signs and limping after gluteus maximus muscle flap transfer [9,10,12–14].

Vastus lateralis muscle advancement may be used for both small and larger defects (> 10 cm) with moderate outcomes [15,16]. Wang et al. reported the results of four patients who have had 10-month follow-up using vastus lateralis muscle advancement. There were three patients who were extremely satisfied with the pain relief. There were two patients who reported being extremely satisfied with improvements in walking. All of them had a positive Trendelenburg sign. One dislocation was observed [15]. Kohl et al. used a vastus lateralis muscle shift in 11 patients and reported 2-year results. Merle d'Aubigne score ($P = 0.001$), pain score ($P = 0.006$), gluteus medius muscle force ($P = 0.0003$), and gait ($P = 0.0003$) improved significantly. There were three patients who had complications, including peroneal nerve palsy, Sudeck disease, and heterotopic ossification [16].

Tensor fascia lata (TFL) reconstruction is another option for massive abductor avulsion after THA [17,18]. Drexler et al. reported TFL muscle transfer in 17 patients who had a 3-year follow-up. Although pain scores ($P = 0.0001$) and Harris Hip Scores ($P = 0.0001$) improved significantly, 53% of these patients had persistent limping [18].

Overall mild to moderate clinical improvement has been reported with reinforcing soft tissue repair with or without muscle flap transfers. However, persistent limping is commonly found during the postoperative period. Major delay in soft tissue reconstruction was associated with worse functional results. Therefore, patient expectations should be optimized appropriately when treating abductor deficiency after THA.

CRediT authorship contribution statement

Şahin Karalar: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **İbrahim Azboy:** Writing – review & editing, Methodology, Formal analysis, Data curation, Conceptualization. **Kerem Basarir:** Writing – review & editing. **Aasis Unnanuntana:** Writing – review & editing, Data curation. **Zhi Yang:** Writing – review & editing. **Javad Parvizi:** Writing – review & editing.

References

[1] Elbuluk AM, Coxe FR, Schimizzi GV, Ranawat AS, Bostrom MP, Sierra RJ, et al. Abductor deficiency-induced recurrent instability after total hip arthroplasty. JBJS Rev 2020;8:e0164.

[2] Di Martino A, Geraci G, Stefanini N, Perna F, Mazzotti A, Ruffilli A, et al. Surgical repair for abductor lesion after revision total hip arthroplasty: a systematic review. Hip Int 2020;30:380–90.

[3] Klemt C, Smith EJ, Oganesyan R, Limmahakhun S, Fitz D, Kwon YM. Outcome of dual mobility constructs for adverse local tissue reaction associated abductor deficiency in revision total hip arthroplasty. J Arthroplasty 2020;35:3686–91.

[4] Kwon Y-M, Rossi D, MacAuliffe J, Peng Y, Arauz P. Risk factors associated with early complications of revision surgery for head-neck taper corrosion in metal-on-polyethylene total hip arthroplasty. J Arthroplasty 2018;33:3231–7.

[5] Lübbeke A, Kampfen S, Stern R, Hoffmeyer P. Results of surgical repair of abductor avulsion after primary total hip arthroplasty. J Arthroplasty 2008;23:694–8.

[6] Miozzari HH, Dora C, Clark JM, Nötzli HB. Late repair of abductor avulsion after the transgluteal approach for hip arthroplasty. J Arthroplasty 2010 Apr;25:450–457.e1.

[7] Incavo SJ, Harper DH. Open hip abductor tendon repair into A bone trough: improved outcomes for hip abductor tendon avulsion. JBJS Essent Surg Tech 2020;10:E0042.

[8] Whiteside LA. Surgical technique: transfer of the anterior portion of the gluteus maximus muscle for abductor deficiency of the hip. Clin Orthop Relat Res 2012;470:503–10.

[9] Ruckenstuhl P, Wassilew GI, Müller M, Hipfl C, Pumberger M, Perka C, et al. Functional assessment and patient-related outcomes after gluteus maximus flap transfer in patients with severe hip abductor deficiency. J Clin Med 2020;9:1823.

[10] Christofilopoulos P, Kenanidis E, Bartolone P, Poultsides L, Tsiridis E, Kyriakopoulos G. Gluteus maximus tendon transfer for chronic abductor insufficiency: the Geneva technique. Hip Int 2021;31:751–8.

[11] Whiteside LA. Surgical technique: gluteus maximus and tensor fascia lata transfer for primary deficiency of the abductors of the hip. Clin Orthop Relat Res 2014;472:645–53.

[12] Chandrasekaran S, Darwish N, Vemula SP, Lodhia P, Suarez-Ahedo C, Domb BG. Outcomes of gluteus maximus and tensor fascia lata transfer for primary deficiency of the abductors of the hip. Hip Int 2017;27:567–72.

[13] Maldonado DR, Annin S, Chen JW, Yelton MJ, Shapira J, Rosinsky PJ, et al. Combined transfer of the gluteus maximus and tensor fasciae latae for irreparable gluteus medius tear using contemporary techniques: short-term outcomes. JB JS Open Access 2020;5:00085.

[14] Ruckenstuhl P, Wassilew G, Theobald K, Hipfl C, Pumberger M, Perka C, et al. Recovery of muscular tissue and functional results of patients treated with A gluteus maximus flap transfer due to chronic abductor deficiency after total hip arthroplasty. Arch Orthop Trauma Surg 2024;144:3063–71.

[15] Wang K, Cole S, White DC, Armstrong MS. Vastus lateralis transfer for severe hip abductor deficiency: a salvage procedure. Hip Int 2014;24:180–6.

[16] Kohl S, Evangelopoulos DS, Siebenrock KA, Beck M. Hip abductor defect repair by means of A vastus lateralis muscle shift. J Arthroplasty 2012;27:625–9.

[17] Strømsøe K, Eikvar K. Fascia lata plasty in recurrent posterior dislocation after total hip arthroplasty. Arch Orthop Trauma Surg 1995;114:292–4.

[18] Drexler M, Dwyer T, Kosashvili Y, Chakravertty R, Abolghasemian M, Gollish J. Acetabular cup revision combined with tensor facia lata reconstruction for management of massive abductor avulsion after failed total hip arthroplasty. J Arthroplasty 2014;29:1052–7.