

ROLE OF SINEFIX™ IN GLUTEUS MEDIUS REPAIR

Tobias Goetz, BSc, Stefan Welte, MD

INTRODUCTION

Gluteus medius and minimus tendon tears are increasingly recognized as clinically relevant causes of lateral hip pain, abductor weakness, Trendelenburg gait, and functional impairment.⁵ Although open and endoscopic repair techniques generally improve pain and patient-reported outcomes, the current surgical treatment landscape remains characterized by several unresolved limitations: delayed diagnosis, heterogeneous surgical techniques, uncertain structural healing rates, incomplete understanding of footprint restoration, variable patient satisfaction, and a lack of consensus regarding the optimal fixation construct.⁵ These limitations create a strong rationale for repair strategies that simplify surgical execution while improving tendon-bone contact mechanics, footprint coverage, and load distribution.

RETEARS

The strongest argument for improvement is not that gluteus medius repair fails broadly, but that clinical success is incomplete and variable.⁶ Published outcomes are generally favorable, and both open and endoscopic repairs have shown improvements in pain and function. However, improvement does not necessarily mean restoration of normal abductor function. In the summarized literature, PASS thresholds after open gluteus medius/minimus repair were reached by only 44.8–65.0% of patients depending on the outcome instrument, despite many patients reaching at least one MCID or PASS threshold.⁶ In another cohort, 21.1% of patients were classified as clinical failures at approximately two years when failure was defined as revision surgery or failure to achieve both MCID and PASS.¹

This creates an important clinical argument: absence of revision or gross retear is not equivalent to a fully successful repair. Patients may remain limited by persistent pain, abductor weakness, limp, incomplete gait normalization, or reduced activity tolerance.

For a procedure whose goal is to restore a key pelvic stabilizer, the relevant end point should not only be tendon attachment, but also restoration of durable force transmission from tendon to bone.^{1,5,6} A device concept that aims to improve tendon-bone fixation, broaden compression over the footprint, and reduce focal stress concentrations directly addresses one plausible mechanism behind incomplete functional recovery: suboptimal mechanical restoration of the tendon-bone interface.^{5,7}

REPORTED RETEAR RATES MAY UNDERESTIMATE TRUE STRUCTURAL FAILURE

Reported retear rates after gluteal tendon repair are relatively low compared with rotator cuff repair, but this comparison is limited. Many gluteal tendon studies define failure clinically or obtain postoperative MRI only in symptomatic patients.

As a result, the true rate of asymptomatic retears, partial structural insufficiency, scar elongation, incomplete footprint healing, or subclinical abductor dysfunction remains unknown.^{2,6}

This highlights a major evidence gap. In rotator cuff repair, routine imaging has shown that structural integrity and clinical outcome can diverge, especially in the short term, but intact repairs are generally associated with better long-term strength and function. The gluteus medius/minimus field has not yet developed the same structural-healing evidence base.^{3,6} If true structural healing is uncertain, then improving the early biomechanical environment becomes especially important. Constructs should be judged not only by whether they “hold” initially, but by whether they minimize gap formation, maintain tendon-bone contact, distribute load physiologically, and preserve biology at the healing interface.

THE OPTIMAL FIXATION CONSTRUCT

Current surgical techniques include transosseous repair, single-row anchors, double-row constructs, transosseous-equivalent repairs, suture-bridge techniques, knotless constructs, rip-stop configurations, and augmented repairs. However, there is no clear consensus on which construct is optimal for which tear pattern. Current reviews emphasize that although multiple fixation constructs and augmentation techniques have been described, comparative clinical and biomechanical evidence remains limited, and further studies are needed to define the optimal construct and the role of augmentation.⁵

This heterogeneity creates several problems for surgeons. Anchor-based repairs can be technically demanding, particularly endoscopically. Suture passage, knot tying, tensioning, anchor placement, and management of degenerative tissue can be time-consuming and technique-sensitive. Open repair offers exposure and may be preferable for large or retracted tears, but at the cost of greater soft-tissue dissection. Endoscopic repair may reduce morbidity, but is technically demanding and less suitable for severely retracted, atrophic, or irreparable tears.^{4,6}

SURGICAL COMPLEXITY

Gluteus medius/minimus repair can be technically demanding. Open repair may be required for larger, retracted, revision, or poor-quality tears, whereas endoscopic repair is less invasive but technically more complex. Current anchor-based techniques may require multiple implants, suture management, knot tying, careful tensioning, and complex spatial orientation around the greater trochanter.^{5,6} SINEFIX was designed as a simplified technique that is easy to learn, with a two-step implantation process while simplifying repair with no suture management or knot tying steps.

A simplified, reproducible implant could reduce technique dependency, shorten learning curve, and make footprint oriented repair more accessible, especially for surgeons who do not perform high volumes of complex endoscopic hip abductor repairs.

FOOTPRINT COVERAGE

The native gluteus medius insertion is broad and anatomically complex. It includes two distinct footprints on the greater trochanter: the lateral facet, with a mean insertional area of 438.0 mm², and the superoposterior facet, with a mean area of 196.5 mm². Therefore, the tendon does not insert as a point attachment. A repair that simply fixes tendon tissue to bone may not restore the native insertional area, contact mechanics, or physiologic load transfer.⁷

This is probably the strongest scientific rationale for a footprint-focused implant. In rotator cuff repair, footprint coverage, contact area, contact pressure, pressure distribution, and gap formation have been extensively studied because they are thought to influence tendon-to-bone healing. In contrast, comparable biomechanical data for gluteal tendon repair remain limited. Current literature specifically identifies footprint coverage, tendon-bone contact area, mean and peak contact pressure, pressure distribution, local stress concentrations, cyclic displacement, gap formation, load to failure, and micromotion as clinically relevant variables that still require systematic evaluation in gluteus medius/minimus repair.⁵

SINEFIX secures tissue by distributing compression across a broad surface area in contrast to suture-based fixation approaches that may concentrate forces and have been associated with tendon cut-through mechanisms. This design rationale maps directly onto one of the major unmet needs in gluteal tendon repair: restoration of broad tendon-bone contact rather than focal point fixation.

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Inovedis Inc.

7625 Golden Triangle Dr., Suite G
Eden Prairie, MN 55344

Phone: 612-445-8362

Mail: cs@inovedis.com

Legal Manufacturer: BAAT Medical Products B.V., RJ Hengelo, The Netherlands

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