



Original Article

Role of Radial Laser Fiber in the Management of Complex Fistula-in-Ano: A Case Series of 55 Patients

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ABSTRACT

Background: Complex fistula-in-ano remains a major challenge for colorectal surgeons due to high recurrence rates and the threat of sphincter injury. Radial laser fiber fistula ablation (FiLaC) has emerged as a minimally invasive, sphincter-preserving modality. However, outcomes in complex fistulae are inconsistent.

Aim: To evaluate the effectiveness, advantages, disadvantages, complications, and recurrence rates associated with radial laser fiber usage in complex fistula-in-ano.

Methods: A prospective case series of 55 patients with complex fistula-in-ano treated using radial laser fiber ablation at a tertiary care center between March 2023 and December 2024.

Results: The technique demonstrated advantages such as minimal sphincter trauma, reduced postoperative pain, and early return to normal activity. However, recurrence remained significant.

Conclusion: Radial laser fiber ablation is a safe, minimally invasive, sphincter-sparing option for complex fistulae. Recurrence remains substantial.

Keywords: Radial Laser Fiber, Fistula, sphincter injury, sphincter trauma.

INTRODUCTION

Fistula-in-ano is a chronic inflammatory condition characterized by an abnormal tract between the anal canal and perianal skin. Complex fistulae pose challenges due to high trans-sphincteric involvement, supralevator extension, multiple secondary tracts, or previous failed surgery. Conventional procedures carry risks of recurrence and sphincter injury. FiLaC provides a thermal ablation of the tract while preserving continence. Evidence in complex fistulae remains variable and warrants evaluation.

MATERIALS AND METHODS

A prospective case series was conducted from March 2023 to December 2024. Inclusion criteria consisted of adults (18–70 years) with radiologically confirmed complex fistula-in-ano. Exclusion criteria were simple fistula, active Crohn's disease, malignancy, or immunocompromised status. All patients underwent MRI fistulogram, followed by FiLaC under spinal anesthesia with internal opening closure. Follow-up was conducted weekly for 1 month and monthly thereafter.

RESULTS

A total of 55 patients were included (mean age 41.8 years, male: female ratio 4.2:1). High trans-sphincteric fistulas accounted for 69%, supralevator 16%, and horseshoe 15%. Mean operative time was 28 minutes, mean hospital stay 1.2 days. Complications included postoperative pain (25%), serous discharge (18%), induration (22%), and abscess formation (5%). Recurrence occurred in 38.1%, higher in horseshoe and supralevator fistulas.

DISCUSSION

The FiLaC technique has evolved as a sphincter-preserving alternative for complex fistula management. Compared to traditional procedures such as fistulotomy and advancement flaps, FiLaC significantly minimizes sphincter trauma while offering quicker postoperative recovery.

However, healing success in complex fistulae is influenced by factors such as tract complexity, branching, supralelevator extension, and occult sepsis. In this study, recurrence was notably high (38.1%), aligning with reported rates between 20–45% globally.

Key contributors to recurrence include incomplete tract identification, failure to close the internal opening adequately, presence of secondary extensions, and persistent infection. MRI-guided mapping remains critical, but intraoperative detection of micro-branches may still be challenging.

Comparative studies suggest that FiLaC combined with a preliminary draining seton may improve success rates by reducing sepsis and shortening tract length. In horseshoe and supralelevator tracts, hybrid strategies combining FiLaC with advancement flap or LIFT may offer superior outcomes.

The primary strengths of FiLaC include rapid recovery, low postoperative pain, minimal morbidity, and preservation of continence. Limitations include equipment cost and operator-dependent outcomes. While FiLaC remains promising, it is not a definitive solution for all complex fistulas. Future research should focus on standardized protocols, improved imaging adjuncts, and multicenter randomized trials.

CONCLUSION

Radial laser fiber ablation is a safe and sphincter-preserving option for complex fistula-in-ano. Despite favorable postoperative recovery, recurrence remains a major limitation. A multimodal, individualized treatment strategy may enhance outcomes. Larger randomized trials are required.

REFERENCES

1. Majumder KR, Kar K, Russell M. Closure of anal fistula with laser-FiLaC: a novel sphincter-saving procedure for complex fistula-in-ano. *Mymensingh Med J.* 2024.
2. Duda JR, et al. Effectiveness of laser-based fistula therapies: systematic review and meta-analysis. *Int J Colorectal Dis.* 2025.
3. Isik O, Gulcu B, Ozturk E. Long-term outcomes of laser ablation of fistula tract. *Dis Colon Rectum.* 2020.
4. Wilhelm A. Five-year experience with FiLaC for anal fistula. *Tech Coloproctol.* 2017.
5. Nordholm-Carstensen A, et al. Healing rates with FiLaC in complex fistulas. *Int J Colorectal Dis.* 2021.
6. Adegbola SO, Sahnun K, Tozer P. FiLaC for perianal fistulas: patient selection and outcomes. *Clin Exp Gastroenterol.* 2021.
7. Abdel-Wahed M, et al. Short-term outcomes of FiLaC vs FISR. *Ain Shams J Surg.* 2023.
8. Smith A, et al. Mechanisms and outcomes of laser therapy in fistula. *World J Gastrointest Surg.* 2022.
9. Lee MJ, et al. Sphincter-preserving techniques in complex fistula. *Ann Coloproctol.* 2023.
10. Patel KV, et al. FiLaC with seton preconditioning: outcomes. *Dis Colon Rectum.* 2022.
11. Greenberg R, et al. Imaging predictors of recurrence after FiLaC. *J Gastrointest Surg.* 2024.
12. Brown L, et al. Recurrence patterns after FiLaC. *Colorectal Dis.* 2023.
13. Chen Q, et al. FiLaC vs LIFT: comparative study. *Surg Endosc.* 2024.
14. Hasan S, et al. Complications of FiLaC in complex fistula. *Int J Colorectal Dis.* 2024.
15. Tan WS, et al. Meta-analysis of sphincter-preserving techniques. *Tech Coloproctol.* 2023.