

Fistula Laser Closure (FILAC)- Use of Radial Emitting Laser Probe

Perianal abscess and anal fistula are some of the most commonly presenting anorectal benign diseases. Anorectal fistulas have been the subject of medical and lay literature for over 2,550 years. Cases of incisions of perianal abscess were sporadic during the Fourth Dynasty of ancient Egypt (2620–2500 BC). Challenging in management of fistula was already described in The Sushant Samhita, one of the most important surviving ancient treatises on medicine. Suhruta (b ~ 800 BC) described both fistulotomy and fistulectomy as well as the use of a chemical seton. Hippocrates (b ~ 460 BC) described the use of horsehair (seta) in the treatment of anal fistula. Magister Johannes de Arderne (1307–1390 CE), considered one of the fathers of proctology, described regimens for treatment of anorectal fistula; a condition believed secondary to long hours in the saddle by the knightly class and sedentary habits in association with chronic constipation among the religious and civil population.¹

The prevalence of anal fistula is estimated to be 1–2 per 10,000 patients, but population-based studies on anal fistula epidemiology are limited. Real world prevalence may be higher, since many patients are treated with antibiotics in the community and some abscesses spontaneously regress or discharge. The true incidence is unknown. Most publications on anal fistula reflect the authors' experience. Anal abscesses and fistulas account for up to 5% of proctological consultations. Multiple fistula tracts occur in 15–20% of cases. The mean age of first presentation is reported to be 40 years in both sexes. Several studies have shown that men are twice as likely as women to develop perianal abscess and fistula. Reasons for this are unclear.¹

Anal fistula repair still remains challenging. Persistent fistulas occur in up to 30% of cases following definitive surgery despite many improvements in surgical skills and technique.² Aggressive treatments, such as fistulectomy, fistulotomy (laid open), and tight setons have a better success rate but with a high risk of incontinence. The modern surgical approach to anal fistulas includes several sphincter-saving procedures,

which offer an attempt at cure whilst minimizing morbidity, especially the incontinence. Colorectalologists now have an armamentarium of options, which includes the closure of the fistula tract with plugs, fibrin glue, or collagen paste without fistulotomy (i.e., laying open), advancement flaps, LIFT (ligation of the intersphincteric fistula tract), VAAFT (video-assisted anal fistula treatment) and laser ablation procedures.³ Some new inventions such as the anal fistula plug or fibrin glue have not proven successful in the long term.^{4,5}

Since it was first described by Rojanasakul *et al* in 2006, LIFT gained popularity due to its high success rate and preservation of continence. A recent meta-analysis over 24 original articles, showed a pooled mean 10-mo of follow-up, 76.5% mean success rate, 0 incontinence and 5.5% postoperative complication rate.⁶

The video-assisted anal fistula treatment (VAAFT) is a new technique performed for the surgical treatment of complex anal fistulas and their recurrences. VAAFT works on the principle of “putting an eye” on the probe and exploring the tract from the inside under direct vision. This allows precise identification of secondary tracts and abscess cavities and minimizes the risk of creating false passages on the way to reaching the internal opening.⁷ Recent systematic reviews are confirming our current success rate attested to be between 67% and 82%.¹

In 2011 Wilhelm reported on the use of a novel diode laser source with radial emitting laser probe. In addition to conventional anal fistula repair using the flap technique, this technique destroys the epithelial layer of the fistula with a newly invented radial emitting laser probe (“FiLaC™”, Biolitec, Germany), which simultaneously obliterates the fistula tract throughout its length from within. The fiber delivered laser energy homogeneously at 360°, causing shrinkage of the fistula tract around the fiber while it was withdrawn at the speed of 1 mm/s.⁸ The thermal energy generated from the laser is dissipated radially, which is different to previous lasers used in coloproctology where linear energy was

used. The aim is the destruction of the granulation tissue and the epithelial cells through a combination of coagulation and shrinkage of the tract. The thermal energy acts on proteins within the tissue, disrupting the structure and supposedly aids the sealing effect.⁸ It is also thought that better accuracy of the laser (in comparison to electrocautery) decreases the risk of damage to surrounding structures (i.e., anal sphincters). There is technique variation in use of laser energy and methods of dealing of internal opening of anal fistula. The laser energy used in the studies varied between 10 and 15 Watts and used a 1470nm wavelength diode laser device. The speed of withdrawal of the fistula probe varied between 1mm/s and 3mm/s. The internal opening was closed with sutures or with a combination advancement flap and sutures in few studies but in the majority of studies internal opening was not closed.³

Few complications were reported following laser treatment Giamundo et al⁹ reported eight (8/43, 18%) patients with temporary pain and anismus postoperatively and three (3/43, 7%) patients with moderate bleeding after FiLaC treatment. All of these resolved without intervention. Similarly, Laurretta et al¹⁰ reported four patients with minor postoperative complications (two with fever, one with severe pain and one with moderate bleeding) that resolved spontaneously.

Many researchers tried to add modification to the LIFT technique targeting better results, insertion of a bioprosthesis in the intersphincteric plane to reinforce the closure of the fistula tract BioLIFT, and adding a transanal advancement flap to evaluate the effect of an additional ligation of the fistula tract on the outcome of transanal advancement flap repair. LIFT with partial coreout fistulectomy (LIFT plus) and insertion of bioprosthesis plug (LIFT Plug). Both original LIFT and its modifications have promising as well as potentially similar outcomes; overall healing in the original ligation of the intersphincteric fistula tract (78.9%) performed relatively less than in the modifications (93.6%).¹¹ Varying success rates and lack of long-term data mean that there is no one universally agreed gold standard and thus treatments are assessed by a combination of patient and surgeon factors.³

DLPL (Distal Laser Proximal Ligation) is an another modification of LIFT procedure. Wilhelm⁸ first published his paper on use of radial emitting laser probe in addition to advancement flap covering of internal opening of fistula, similarly radial laser probe is being used in

addition to LIFT procedure in DLPL technique to improve the outcome of anal fistula surgery. The laser procedure is relatively easy to learn technique and has been demonstrated to be safe. Further studies are still needed to discern the role of laser therapy in the armamentarium of fistula surgery.

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