### **Original Research Article**

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# Initial results of using VAAFT in the management of fistula-in-ano: a prospective observational study

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#### **ABSTRACT**

**Background:** The aim of this study is to present their initial 5-year experience in the treatment of fistula-in-ano by means of VAAFT (Video-Assisted Anal Fistula Treatment).

**Methods:** 76 patients were competent for the VAAFT procedure. Patients were subjected to routine diagnostic tests. 20 patients had classical fistula surgery. In the remaining 56 patient full procedure i.e. diagnostic fistuloscopy, closing the internal ostium, and coagulation of the fistula canal was done. The mean observation period was 23 months.

**Results:** Majority of the cases, inter-sphincter fistula and multiple branching was observed during the diagnostic fistuloscopy. Nine patients had additional fluid compartments. In 56 patients subjected to the full VAAFT procedure the internal ostium was closed using a linear stapler. A recurrence of fistula was observed in one, while non-healing was seen in two patients. Major complications like stool and gas control deterioration (based on the FISI scoring) were not observed in VAAFT operated patients.

**Conclusions:** The VAAFT method preserves sphincter competency, no major intraoperative and postoperative complications were observed. The recovery rate is observed to be comparable with other techniques without the risk of incontinence. It is one of the best method enabling intraoperative visualisation and identification of the internal ostium and fistula canal. Initial optimistic results require further investigations on a larger group of patients.

Keywords: Fistula in ano, Minimally invasive procedure, Surgery of fistula, Video-assisted anal fistula treatment

#### INTRODUCTION

Fistula in ano is a common surgical problem. It is notorious to recur which poses a difficult issue for the treating surgeon. Fistula treatment can possibly cause irreversible sphincter damage causing embarrassment and poor functional outcome.

Thus, it becomes important for the treating surgeon to appropriately plan the management of anal fistulas. Proper counselling and planning is often required.

Intraoperative anal fistula image correlates in 61% of fistulography results, and the estimated sensitivity of imaging ranges between 24 and 50%. During the fistula surgery, the fistula canal and internal ostium are identified in only  $1/3^{\rm rd}$  cases.

Improper instrumentation and rough handling during surgery often leads to development of a "blind" opening. Magnetic resonance imaging is sensitive, but expensive and scarcely available investigation therefore its use is only justified in difficult and complex fistula in ano.<sup>2</sup>

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Many attempts have been made for the treatment of complex fistula in ano, but still it continues to be a difficult problem. In recent years, with increasing emphasis on the preservation of anal sphincter function, various sphincter-saving techniques have become popular research topics in complex anal fistula treatment.

Currently, the main techniques include fibrin glue, fistula plug, transanal advancement flap repair (TAFR) and ligation of the intersphincteric fistula tract (LIFT).<sup>3</sup> However, their healing rates vary widely from 14% to 81.4%.<sup>4-7</sup> Meinero in 2006 developed a minimally invasive novel sphincter saving technique for complex fistula management called VAAFT (Video assisted anal fistula treatment). Being a new technique, its applications, effectiveness, indications and success rates needs to be investigated further. Authors share their 5-year experience of a using VAAFT in the treatment of fistula in ano.

#### **METHODS**

During the period between 2012 and 2017, 76 patients were qualified for the VAAFT procedure. All patients were evaluated via per rectal examination. Evaluation of comorbidities and necessary investigations along with Preanesthetic check-up were done. Polyethylene glycol solution was used one day before the operation and glycerine enema on the day before surgery was administered for bowel preparation. The study was approved by the hospital Ethical committee and all patients provided written informed consent.

Description of the procedure: Patients were operated in Lithotomy position. Spinal anesthesia was given in all 76 patients. The diagnostic fistuloscopy was done in all cases. Fistuloscope manufactured by Karl Storz (Germany) along with its various accessories (obturator, unipolar cautery electrode, endobrush, fistula probe and forceps) was used. The irrigation channel was connected with 1% Mannitol solution bag at 6 feet height. Authors used mannitol for irrigation and current conduction as stated by Meinero.

Fistuloscope was introduced in the external opening under direct vision. It was gently advanced further along the fistula tract under continuous mannitol flow. During fistuloscopy the main fistula canal and its various secondary branching were identified. The fistuloscope was taken up to the internal ostium. Internal ostium was confirmed by visualising the light of the fistuloscope in the anus by proctoscopy. Internal opening was marked with a suture. The therapeutic stage comprised coagulation and fulguration of fistula walls by means of a monopolar cautery which was introduced through the fistuloscope. The debrided necrotic tissue was removed by means of irrigating solution and a brush peeled the adherent necrotic material. After complete cleansing of the fistula tract, the internal ostium was closed by various techniques. (Linear stapler in all VAAFT procedures).

Before the procedure finished the external opening was excised leaving the wound open for drainage.

Patients were assessed for pain along with any complication and started liquid diet. After the first bowel movement full oral diet with laxatives was started. Dressing was removed on first operative day and Sitz bath started. Patients were discharged once full oral diet was tolerated. During the discharge, a PR exam was done, and patients filled out a questionnaire based on the FISI scale (incontinence to gas, mucus, liquid stool and solid stool).

The data was collected including baseline characteristics, perioperative and postoperative data along with patient feedback forms and questionnaires. All patients were requested for a follow-up visit at 1, 6, 12, 24 months postoperatively. Symptoms of fistula in ano, anal incontinence, and recovery over time were the main outcomes observed during the follow up period. Appropriate statistical tests were used for comparison of data.

#### **RESULTS**

Total 76 patients were evaluated. The study arms comprised 49 male and 27 female patients (1.8: 1) with average patient age as 56 years. 8 patients had undergone some operative procedure for the fistula treatment in the past, of which 5 patient had Seton, while 68 were new patients (Table 1). Diagnostic VAAFT was done in all 76 patients. Due to multiple fistula branching and presence of numerous fluid compartments 20 patients were qualified for classical fistula surgery. The remaining 56 patients underwent VAAFT.

**Table 1: Baseline characteristics of patients.** 

Variables	Value
Age (Years)	
31-40	1
41-50	12
51-60	44
61-70	10
>70	7
Median age	56.4 years
Gender	
Male	49
Female	27
Previous surgery	
Yes	8
No	68

The mean duration required to complete the procedure was 45.6 minutes, ranging between 30 to 84 minutes. Simple type of fistula was observed in 32 patients and Intersphincteric/ branched type was found in 44 cases. Eight patients had cavity and associated abscess along the

fistula tract, while in 11 patients, authors were unable to accurately identify the internal opening.

Table 2: Operative details.

Variables	Findings
Type of fistula	
High-transphincteric	12
Suprasphincteric	42
Extrasphincteric	19
Horseshoe shaped	3
Internal opening site	
Rectum	7
Dentate line	41
Anal canal	28
Fistula tract	
Single/ simple	32
Multiple/ branched	44
Operative time (average)	45.6 mins (30-84 mins)
Type of surgery	
Classical surgery (open)	20
Linear stapler	9
Glue	6
Mattress suture	5
VAAFT (all linear staplers)	56

Twenty cases (including 3 horseshoe type) had complicated and multiple additional branching and fluid compartments which required classical surgery. All the 56 VAAFT operated cases, the internal ostium was closed using linear stapler. Of the 20 patients who underwent the classical procedure the internal ostium was closed by means of a linear stapler in 9 cases, mattress sutures in 5, and 6 required tissue glue for closure. Patients with VAAFT procedure returned home in average 2.3 days while patients with other conventional (open) procedure took 5.7 days (Table 2).

Table 3: Early and late complications.

Variables	Findings			
<b>Duration of hospitalization</b>				
VAAFT (n=56)	2.3 days (1-4 days)			
Open procedure (n=20)	5.7 days (3-8 days)			
Early postoperative complications (<6 month) n=76				
Bleeding	1 (open)			
Intolerable pain (VAS>7)	3 (open)			
Faecal/ gas incontinence	0			
Sepsis / SSI	2 (1 open, 1 VAAFT)			
Non-healing	14 (8 open, 6 VAAFT)			
No complication	56			
Late postoperative complications (>6 month) n=76				
Non-healing/ persistent fistula	10 (8 open, 2 VAAFT)			
Faecal/ gas incontinence	0			
Recurrence	1 (open)			

The mean observation period was 23 months. Surgical site infection was seen in 2 patients. While non-healing was seen in 14 patients. No other major complications

were observed in early follow-up (< 6 months) period. Of the 6 cases where glue was used to close the internal ostium, retained glue removal was additionally required in 3 patients who complained of perianal pain (VAS>7), while 2 patients with glue had persistent discharge. In one patient, the glue came out of its own. All the 8 patients who had some previous procedure performed had SSI and non-healing. During late follow-up period (>6 months) a persistent fistula (non-healing) was observed in 10 patients, while in one anal fistula recurrence was observed after 12 months of healing. In the remaining 10 patient fistula healed spontaneously without recurrence, at the end of an average 23-month observation period. No re-surgery was required. There were no other complications during this late observation period. Flatulence and Stool control deterioration was also not observed during this 23 months (based on the FISI scale) (Table 3).

#### **DISCUSSION**

The surgical techniques for the treatment of fistula in ano has evolved over the years.<sup>4</sup> Introduction of minimal invasive surgeries in fistula treatment has reduced the risk of postoperative stool incontinence, and enhance recovery, as compared to open procedures. In the past century fistulectomy and partial fistulotomy (lay-open procedures) ("cutting procedures") were frequently employed. They were later on replaced by more conservative "noncutting" procedures. Many studies published after 2000, show the trend of minimally invasive techniques.<sup>5</sup>

Complex fistula closure has been tried with various techniques (Setons) tissue glue, LIFT, laser devices, Surgisis etc). 4,6-9 Most of these methods have proven useful in treatment of fistula but, these methods does not actually recognize the fistula tract, its branching, internal ostium and blind canals. Lay open procedures if used to manage complex/ branched fistula, have high chances of sphincter damage.<sup>3</sup>

Use of *Ksharasutra* (Ayurvedic medicated cotton thread) or cutting Setons have known to preserve sphincter functions but still they cause various complication like incontinence, chronic discharge and prolonged healing time. Fibrin glue injections have easy technique with minimal side effects, but long-term success rate is 14%. Trans anal Advancement Flap Repair (TAFR) is a sphincter saving technique with recurrence rates from 7-49%. Ligation of Intersphincteric Fistula Tract (LIFT) is a widely recognised procedure but it is challenging and may jeopardize blood supply of sphincter and rectal mucosa.

LASER based techniques use radial emitting laser probe to destroy the fistula tract, however there are problems associated with identifying internal ostium, secondary tracts/ branching and abscess cavities. 15,16 Over-The-Scope-Clip (OTSC) are good alternatives but secure

closure is not possible in fibrotic internal opening.<sup>17</sup> Fistula closure using different plugs (Surgisis) is also a minimally invasive procedure without the risk of sphincter damage.<sup>5</sup> However, primary closure of the fistula is observed in 50% of patients with the relatively high material costs.

The real principle behind successful treatment of fistula lies in the sealed closure of internal opening with adequate drainage of the fistula tract. <sup>18-23</sup> VAAFT technique uses a specialised fistuloscope which allows intraoperative visualisation of the internal ostium and anatomy of fistula tract under direct vision. The internal ostium is closed under vision with adequate drainage of the debrided tract.

In the present study 56 patients underwent VAAFT procedure. Of them one (1.7%) had SSI and 6 (10%) had early non-healing. Two (3.5%) patients had persistence of fistula while 41 (73%) patients healed without recurrence after VAAFT procedure. During the 23-month observation period uncomplicated recovery was noted in more than 73% of patients. Comparing the classical layopen procedures with VAAFT authors see that VAAFT does not pose the risk of sphincter damage. None of present patients had any deleterious effect on sphincter control functions. present results are similar to the various studies in the literature which shows the effectiveness of VAAFT. It also showed usefulness in patients with recurrent fistula. Twenty patients underwent classical fistula surgery. In 6 patients glue had been used to close internal ostium. These patients had more complications in the form of glue retainment (3) with chronic pain (1) and discharge (2). Mattress suture was used in 5 and linear stapler in 9 had similar findings to VAAFT (Table 4).<sup>24-32</sup>

Table 4: VAAFT results in literature.

Study	Healing without recurrence/ asymptomatic	Recurrence/ persistence of fistula rate
Cheung FY et al	81%	-
Emile SH et al	-	17.7%
Amir, Mohammed	82%	6.6%
Meinero P et al	70%	-
Prato AP et al (Paediatric study)	61%	30%
Seow-En et al	70%	29%
Romaniszyn M et al	75%	20.6%
Chowbey PK et al	-	26.1%
Mendes CR et al	-	12.5%
Our study	73%	3.5%

Fistula closure techniques like LIFT (Ligation of Intersphincteric Fistula Tract) is another sphincter-saving method. 6.7 It gives promising results amounting to 90% of recovery. However, the method is technically difficult or impossible to perform in case of high anal or intersphincteric fistulas. FiLac TM is (Fistula LASER

closing device) a newer laser-based device which has reported an 80% recovery rate in a study by Wilhelm et al, however, this method does had minor incontinence to mucus and gas.<sup>9</sup> Schwandner et al applied VAAFT technique in Crohn's disease patients with high identification rate of occult side tracts with encouraging short term healing rates.<sup>11,12</sup>

With present 5-year experience authors found that careful exploration of fistula tract is necessary for good results. The walls must be carefully cauterised to avoid thermal damage to surrounding tissues. Of the many methods to close internal ostium, authors had good results with linear staplers. A single firing is sufficient to close the internal ostium, and this greatly reduces the time required for completion of surgery. Patients in whom Ksharasutra/ Seton was employed previously had intense fibrosis at the internal ostium. Stapling was difficult as the pliability of the tissue was reduced. In such cases, an elliptical incision was taken around it, tissue pulled up and then linear stapling was done. Recurrent fistula seems to be easy to negotiate and treat as tract is well formed, has wider diameter and easily draining compared to primary fistula. It should be remembered that the tissue around the internal opening is loose, so tissue manipulation should be gentle to prevent formation of iatrogenic fistula. Also, fistula irrigation should not be done under high pressure as it may callus local spread of infection which may lead to delayed recurrence.<sup>2</sup> Use of glue had complications and discomfort to the patients. However largescale randomised multicentre trials are needed before completely negating glue usage. In present study most, patients were subjected to ostium closure by means of a linear stapler (56 patients) which increases the overall cost of surgery compared to open technique. The best internal ostium closure technique is still under debate and is at operating surgeon's discretion. Authors feel present data sample is insufficient to suggest an established ostium closure recommendation.

Authors broadly summarise few causes to abandon the VAAFT procedure. If there is failure to negotiate along the fistula tract curves, failure to dilate fistula tract, rupture of fistula and if false tract formation occurs. Also, besides that few problems faced initially during the beginning were failure to negotiate the outer opening. This was overcome by slight dilatation of fistula opening using a malleable fistula probe. Authors believe rupture of the fistula tract during fistuloscopy occurs due to high pressure of irrigation fluid or by thrusting the fistuloscope blindly while negotiating the tract. To avoid these problems authors recommend keeping the irrigation bottle <6 feet high, avoiding use of pressure bags to increase pressure and after starting irrigation wait for some time so that the fluid builds up inside and dilates the tract. Authors recommend avoiding blind thrusting of the fistuloscope probe. The "V" types of fistula tract are difficult to negotiate and patience along with good instrument handling is expected to avoid complications.

#### **CONCLUSION**

The VAAFT technique enables direct intraoperative visualisation and treatment of fistula in ano. VAAFT is minimally invasive technique which preserves sphincter function with similar complication rates. As a new method it has its learning curve, present inceptive positive results need further evaluation on a larger group of patients along with long term follow-up. Many multicentre randomised control trials are needed to establish VAAFT as the primary modality of complex fistula treatment.

Limitations: The limitations of this study included potential single institution bias, lack of anorectal manometry and potential selection bias.

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Institutional Ethics Committee

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