

An experience with video-assisted anal fistula treatment (VAAFT) with new insights into the treatment of anal fistulae

I. Seow-En¹ · F. Seow-Choen^{2,3} · P. K. Koh²

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Abstract

Background The aim of this retrospective study was to assess our experience of 41 patients with anal fistulae treated with video-assisted anal fistula treatment (VAAFT).

Methods Forty-one consecutive patients with cryptoglandular anal fistulae were included. Patients with low intersphincteric anal fistulae or those with gross perineal abscess were excluded. Eleven (27 %) patients had undergone prior fistula surgery with 5 (12 %) having had three or more previous operations.

Results All patients underwent the diagnostic phase as well as diathermy and curettage of the fistula tracts during VAAFT. Primary healing rate was 70.7 % at a median follow-up of 34 months. Twelve patients recurred or did not heal and underwent a repeat VAAFT procedure utilising various methods of dealing with the internal opening. There was a secondary healing rate of 83 % with two recurrences. Overall, stapling of the internal opening had a 22 % recurrence rate, while anorectal advancement flap

had a 75 % failure rate. There was no recurrence seen in six cases after using the over-the-scope-clip (OTSC[®]) system to secure the internal opening.

Conclusions VAAFT is useful in the identification of fistula tracts and enables closure of the internal opening. Adequate closure is essential with the method used to close large or fibrotic internal openings being the determining factor for success or failure. The OTSC system delivered the most consistent result without leaving a substantial perianal wound. Ensuring thorough curettage and drainage of the tract during VAAFT is also important to facilitate healing. We believe that this understanding will bring about a decrease in the high recurrence rates currently seen in many series of anal fistulae.

Keywords Anal fistula surgery · VAAFT · Internal opening · OTSC · Anorectal advancement flap

Introduction

Anal fistula is a common affliction which had been well described since antiquity with known descriptions of the disease dating from about 400 BC [1]. Despite many advances in therapy, it continues to be problematic to treat with a high recurrence rate even in skilled hands. The treatment philosophy for anal fistulae is centred around eradication of associated sepsis, identification of the internal opening of the main tract and the presence of associated secondary tracts as well as the avoidance of anal continence disturbance in the process of treatment. Here we report our initial experience with the use of video-assisted anal fistula treatment (VAAFT[®], Karl Storz GmbH, Tuttlingen, Germany) for cryptoglandular anal fistulae and new insights gained as a result thereof.

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✉ F. Seow-Choen
seowchoen@colorectalcentre.com

¹ Department of General Surgery, Singapore General Hospital, Singapore, Singapore

² Fortis Colorectal Hospital, Singapore, Singapore

³ 290 Orchard Road, Paragon #06-06, Singapore 238859, Singapore

Materials and methods

Following a workshop on VAAFT in Singapore in February 2012 led principally by Piercarlo Meinero, the present authors started using VAAFT as part of their strategy for appropriate patients with cryptoglandular anal fistulae. The VAAFT technique had been well described and consists of diagnostic and therapeutic phases [2].

Consecutive patients with cryptoglandular anal fistulae were included. We excluded patients with low intersphincteric anal fistulae as these are routinely treated in our centre with a simple lay open procedure. Patients with gross perineal abscesses, Crohn's disease, tuberculous or carcinoma-associated fistulae were also excluded from this study.

Patient characteristics

Forty-one patients, 35 males and six females, were treated with VAAFT from February 2012 to June 2014. The median age was 44 years (range 18–69 years).

Thirty patients had not undergone any previous anal fistula surgery. Four patients had had one previous operation, while two patients had had two previous operations. Five patients had undergone three or more previous procedures. The procedures previously performed for these 11 patients are listed in Table 1. Not all previous operative notes were available as most of these previous procedures were performed in other centres.

Twenty-one patients did not undergo any form of preoperative evaluation of their fistula except for clinical digital examination. Eleven patients underwent preoperative endoanal ultrasonography, and nine patients underwent preoperative magnetic resonance imaging. With these investigations augmenting the diagnostic phase of VAAFT,

28 patients were found to have single transsphincteric tracts, while ten had transsphincteric tracts with associated horseshoe or secondary tracts. Two patients had extrasphincteric tracts and one an intersphincteric tract.

During the diagnostic phase of VAAFT, internal openings of the fistula tracts could not be found in 3 (7.3 %) patients.

Results

All tracks were carefully followed during the diagnostic phase of VAAFT. During the therapeutic phase of VAAFT, all patients underwent diathermy of the granulation tissue of the tracts and thorough curettage for cleansing of the tracts. In 36 cases, closure of the internal openings of the fistulae was performed using the articulating endocutter ENDOPATH[®] 35 (Ethicon US LLC). In three of these 36 patients, the internal opening was not found and the stapler was applied to the portion of the dentate line where the internal opening was most likely to be. This was ascertained by the nearest point from the VAAFT scope and the position of the fistula tract. These three patients did not suffer any recurrence. Anorectal mucosal advancement flaps were used in four patients and the over-the-scope-clip (OTSC[®]) system (Ovesco Endoscopy AG, Tübingen, Germany) in one patient.

In the initial three cases where the stapler was used, synthetic cyanoacrylate was applied into the fistula tract as described by Meinero [2]. However, we found that the hard concretions of cyanoacrylate had to be removed in these cases before the fistula could heal completely.

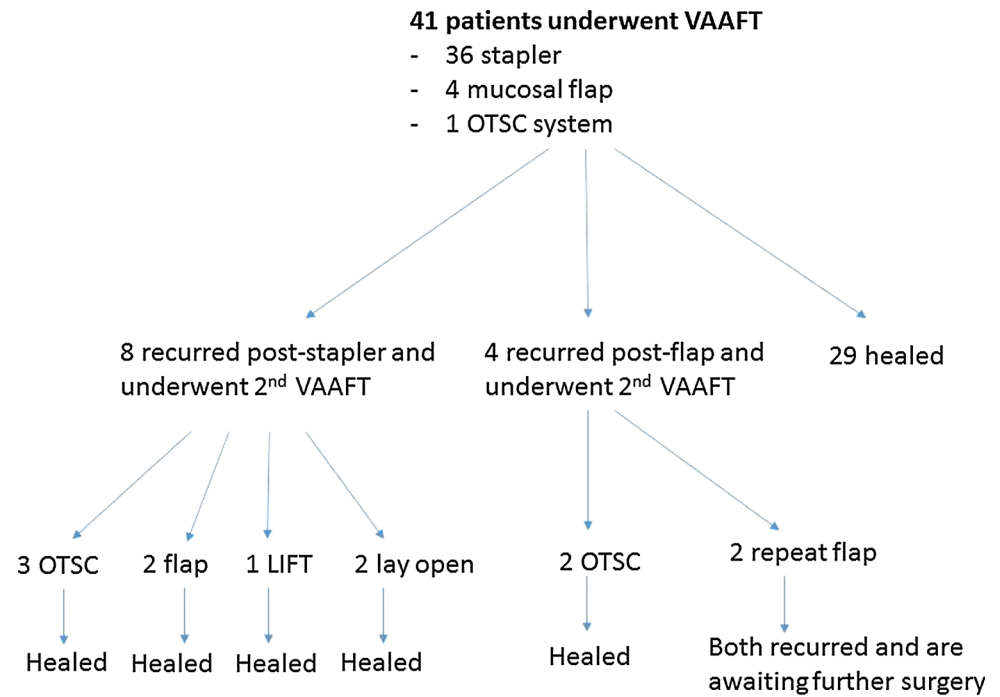
The overall treatment flowchart is summarised (Fig. 1). Twenty-nine (70.7 %) patients were found to have healed at a median follow-up duration of 34 months (range 12–44 months). Twelve patients recurred or did not heal with subsequent examination showing residual anal fistula tracts with patent internal openings. This included all four patients who initially underwent mucosal advancement flaps. All 12 patients with recurrence had a repeat VAAFT procedure utilising various methods of dealing with the internal opening. In two patients, the residual transsphincteric tracts were found to be low and laid open. In five patients, the internal openings were closed with the OTSC system, and in one by ligation of the internal fistula tract (LIFT) [3]. Mucosal advancement flaps were used in four patients, two of whom recurred after the initial flap and the other two who recurred post-stapling. Both patients who had a second mucosal flap recurred once more and are currently awaiting further surgery. The OTSC system had not yet been available for use for these two patients who had recurred following the first flap, at that point of time. The secondary healing rate was 83 % at a median follow-up of 19 months (range 6–36 months).

Table 1 Previous procedures in chronological order

Patient	
1	I&D
2	I&D
3	I&D
4	I&D
5	I&D → lay open
6	Fistula plug → seton
7	I&D → lay open → lay open
8	Lay open → seton → LIFT
9	I&D → seton → mucosal flap → mucosal flap
10	Lay open → lay open → seton → seton
11	Lay open → seton → seton → mucosal flap

I&D incision and drainage of anal abscess, LIFT ligation of internal fistula tract

Fig. 1 Treatment flowchart indicating method used to close internal opening



Overall failure rates of the methods used to deal with the internal openings are shown (Table 2). Of note is the 100 % success rate of healing in six patients when the OTSC system was used in five cases for recurrent fistulae, including two cases of recurrence following the initial anorectal mucosal flap.

No formal assessment of continence was performed in the course of this retrospective review. Nonetheless, all patients were specifically asked about any change in anal function or continence post-operatively and a record was made in the case notes. None of the 41 patients were noted to experience any substantial change in their anal control during the follow-up period.

Discussion

Since the advent of modern medicine, the treatment of anal fistulae has been based on the four main principles of eradication of the primary tract, identification and eradication of any secondary tracts, identification of the internal opening and preservation of anal sphincter function. The

position statement of the Association of Coloproctology of Great Britain and Ireland published in 2007 stated that the key to successful treatment of anal fistulae is the eradication of the primary tract [4]. This incorrect emphasis on fistula tract eradication has led many surgeons to misunderstand the reason for persistence of the fistula, hence resulting in a high recurrence rate following surgical treatment. Instead, we have come to the realisation that the key to fistula healing lies in the closure of the internal opening together with adequate drainage of the tract.

Lay open of an anal fistula tract is often performed when the anal sphincters are minimally involved. This procedure heals the fistula by eradicating the internal opening as well as the entire tract. Complete lay open will cure complex or high anal fistulae but is not practical because of the loss of anal sphincter function following the excessive muscle mass that would have to be cut in these patients to achieve healing.

In our series, several methods were used to close the internal openings in difficult cases. In our initial experience, we used the linear stapler primarily as the OTSC system was not available then. However, we found that

Table 2 Methods of closing internal opening of anal fistulae and failure rates

Method	Stapler	OTSC	Mucosal flap	LIFT	Lay open
Primary surgery	36	1	4	0	0
Second surgery	0	5	4	1	2
Total no. of failures (%)	8 (22 %)	0 (0 %)	6 (75 %)	0 (0 %)	0 (0 %)

OTSC over-the-scope-clip system, LIFT ligation of internal fistula tract

secure closure with the linear stapler was not easy to achieve in some cases. This was due to fibrosis preventing full thickness of mucosa, submucosa and some muscle to be secured within the staples. Very often, the staples would only partially catch mucosa or a mucosal defect would still be evident after stapling. The OTSC system became available later in our experience, and this enabled a better closure of larger or more fibrotic internal openings. This is due to the jaw-like device and push system allowing even submucosa and a partial muscle layer to be caught within the clip, with the aid of traction sutures around the internal opening.

Although cases may differ widely from each other, we found that adequate closure of the internal opening offers the best chance of success. VAAFT is an ideal instrument for diagnosis of the fistula tract and locating the internal opening. However, severe mucosal fibrosis from multiple previous surgeries, or a large internal opening often seen in patients after long-standing seton placement, limits the options for closure of the internal opening. This is the bugbear of complex fistula surgery. Techniques such as lay open or LIFT often require a substantial perianal wound and may also result in anal sphincter injury or incontinence, especially in higher fistulae. We have found the OTSC system to be preferable to the linear stapler. In very difficult situations, the use of anorectal mucosal advancement flaps may be the only possibility. However, flap failure is common due to unhealthy surrounding tissue and fibrosis [1], resulting in flap dehiscence and exposure of the internal opening to faecal matter with subsequent re-infection.

Curettage and diathermy of the tract external to the internal opening is also an important component of VAAFT. This is followed by appropriate widening of the external opening with daily flushing thereafter to ensure adequate drainage of the debrided tract. Without adequate drainage, an abscess may form within the tract which may then lead to a breakdown of the internal opening and hence recurrence.

Failure to correctly ascertain the presence of secondary tracts has also been blamed for persistence of anal fistulae after surgery [5]. These branched tracts can be easily visualised and treated during fistuloscopy and hence easily drained during the performance of VAAFT. With complete closure of the internal opening and adequate drainage, the existence of branched tracts is not a hindrance to complete healing of the fistula.

Fibrin glue injection is a technically easy, low-risk technique. Results have been disappointing, however, with long-term success rates as low as 14 % [6]. While the glue may seal the deepest parts of the tract, it is usually difficult to ensure a complete seal at the level of the internal opening. Likewise, we have stopped the injection of cyanoacrylate after closure of the internal opening as we found it impaired drainage of the tract and delayed healing

without assurance of a more complete internal opening closure.

The insertion of an anal fistula plug may be simple as well, but recurrence is certain if the plug dislodges from the internal opening. A recent review concluded that the most important technical steps are firm suturing of the head of the plug in the primary opening and wide drainage of the secondary opening [7]. Similarly, the LIFT technique is based on the principle of secure closure of the fistula tract near the internal opening [3]. SLOFT or submucosal ligation of the fistula tract is a recent variation which seeks to divide and ligate the tract even closer to the internal opening.

To appreciate why fistulae recur, it should be understood that methods used to cleanse, eradicate or improve drainage of the fistula tracts do not necessarily deal with the internal opening. Although many methods for closure may be employed, including stapling, the OTSC system, mucosal flaps or LIFT, further larger-scale studies should be done to determine the best technique, especially for difficult cases.

Conclusions

VAAFT is useful in the identification of fistula tracts and enables closure of the internal opening. Adequate closure is essential, with the method used to close large or fibrotic internal openings being the determining factor for success or failure. The OTSC system delivered the most consistent result without leaving a substantial perianal wound. Ensuring thorough curettage and drainage of the tract during VAAFT is also important to facilitate healing. We believe that this understanding will bring about a decrease in the high recurrence rates currently seen in many series of anal fistulae.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval The authors complied with all routine ethical standards during the course of this study.

Informed consent Informed consent for surgery was obtained from all patients included in this study.

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