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Review

Video-Assisted Anal Fistula Treatment (VAAFT) in Cryptoglandular fistula-in-ano: A systematic review and proportional meta-analysis

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HIGHLIGHTS

- Video-Assisted Anal Fistula treatment (VAAFT) has a minimal risk to incontinence and low morbidity.
- All studies describing VAAFT in Cryptoglandular fistula were reviewed and meta-analysis was done.
- VAAFT has a success rate of 76% (net Proportion Meta-analysis pooled rate).
- This is the first time that a meta-analysis has been done to analyze the efficacy of VAAFT procedure.

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ABSTRACT

Background: Video-Assisted Anal Fistula Treatment (VAAFT) is a relatively new minimally invasive videoendoscopic procedure for treating fistula-in-ano. We reviewed and performed metaanalysis to evaluate the efficacy of this procedure.

Methods: Studies from the period 2010 to 2016 were searched in PubMed, Medline, Scopus, Embase, Ovid, SCI database, Cochrane Central Register of Controlled Trials (CENTRAL) & Google Scholar database. All studies which utilized VAAFT to treat fistula-in-ano were extracted. The studies in which the Cryptoglandular fistula were treated were included. Procedure's done in patients with Crohn's disease, pediatric patients and associated malignancy were excluded from the study. The primary outcome parameter was success rate in fistula healing and the secondary outcome parameters were operating time, hospital stay, return to work, incontinence rate and complication rate.

Results: A total of 1378 studies were screened. Out of these, eight studies were finally included for meta-analysis. The analysis (n = 786) demonstrated a net Proportion Meta-analysis pooled rate of 76.01% (95% CI = 68.1 to 83.9) for success rate, 16.2% (95% CI = 12.1 to 20.2) for complications, 44.7 min (95% CI = 38.3 to 51.2) for operating time, 1–4.1 days for mean hospital stay and 1–11 days for return to work. None of the studies reported worsening of continence levels.

Conclusions: VAAFT is a safe videoendoscopic method to treat fistula-in-ano with an overall success rate of 76% (net Proportion Meta-analysis pooled rate). The main benefit of the procedure is minimal risk to incontinence, minimal hospital stay and early return to work.

1. Introduction

Complex fistula-in-ano is difficult to treat because of risk to incontinence and higher rates of recurrence. Fistulotomy is associated with a higher incidence of incontinence [1] whereas other new minimally invasive methods like Anal Fistula Plug [2], Fibrin glue [3], FiLaC laser [4], OTSC proctology [5] and Ligation of intersphincteric fistula tract(LIFT) [6] are associated with high recurrence rates in complex fistula-in-ano.

Video-Assisted Anal Fistula treatment (VAAFT) was first developed in 2006 [7] by Piercarlo Meinero and a success rate of 87% was reported in treating fistula-in-ano. The highlight of this procedure was minimal risk to incontinence and low morbidity. Since then, several studies have been published describing this procedure [8–15]. However, no meta-analysis has been published in the

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literature so far which has analyzed the efficacy of this procedure. We retrieved all studies describing Video-Assisted Anal Fistula treatment (VAAFT) in Cryptoglandular fistula. A systematic review (proportion meta-analysis) of these studies was done to obtain a pooled result and to ascertain the success (healing) rate, complications, impact on incontinence and other parameters of morbidity of VAAFT. We also tried to analyze the efficacy of this procedure in complex fistula-in-ano.

2. Methods

2.1. Literature search

The databases of PubMed, Medline, Scopus, Ovid, Cochrane central register of controlled trials (CENTRAL) and Google scholar were searched. First, PubMed was searched for the keywords “anal fistula treatment”. Since VAAFT was first published in the year 2011, the search was narrowed down for the period January 1st, 2010 to January 15th, 2016. Subsequently, the keyword “video” was added to the search. Simultaneously other databases, were searched using the same keywords and studies found were extracted. The databases were also searched for keywords “VAAFT”, “Video-Assisted Anal Fistula Treatment”, “video endoscopic treatment of anal fistula” to cross check for any missing studies.

Only peer reviewed published articles were taken into consideration. The search was made by two authors independently (PG, PS). The study was registered at Review Registry (Number 268).

3. Definitions

3.1. Video-Assisted Anal Fistula Treatment

3.1.1. Success rate

Complete clinical healing of fistula in the anal tract. In patients with multiple tracts, the procedure was considered successful only if all the tracts were closed.

3.2. Types of Fistula-in-ano

3.2.1. Simple

Low subcutaneous or intersphincteric fistula in which fistulotomy can be done without any risk to incontinence [16]. These are fistula which include less than 30% of the external sphincter [16,17].

3.2.2. Complex

Fistula in which fistulotomy would pose serious risk of incontinence. These include fistula which are high [suprasphincteric, extrasphincteric or high-transsphincteric (track crosses >30 to 50% of the external sphincter)], anterior fistula in a female, fistula with multiple tracts, or the patients with preexisting incontinence, local irradiation, or Crohn's disease [16,17].

3.3. Inclusion criteria for the studies

All studies (randomized controlled trial, prospective or retrospective) in which Video-Assisted Anal Fistula Treatment (VAAFT) procedure was utilized to treat Cryptoglandular fistula-in-ano were included in the study.

3.4. Exclusion criteria for the studies

The following studies of fistula-in-ano in which Video-Assisted Anal Fistula Treatment (VAAFT) was done were excluded from the study

- Crohn's fistula-in-ano
- Patients of fistula-in-ano with known malignancy, tuberculosis, pelvic radiotherapy or existing incontinence
- Pediatric patients (<12 years) with fistula-in-ano

3.5. Data extraction

The data was extracted separately by the reviewers to guard against the reviewers' bias. The names of the authors were blinded and only the methods and the results were reviewed. Any discrepancy was resolved after discussion and consensus was achieved between the reviewers. The PRISMA methods were adhered to while doing data extraction and analysis. For particular outcomes that were evaluated, if the data was not specifically reported, it was regarded as not reported or missing and no assumption was made regarding the missing data. The articles in languages other than English were first translated into English at the site http://translate.google.com and then analyzed.

3.6. Outcome parameters

Primary outcome parameter

- Success rate

Secondary outcome parameters

- Operating time
- Hospital stay
- Return to work
- Complication rate
- Incontinence rate

4. Statistical analysis

For continuous outcomes, standardized effect size was determined to get the pooled effect size and if the number of events were reported, then proportion meta-analysis was used [18,19].

The Stats-Direct statistical software version 2.8.0 software(Cheshire, UK) was used for the analysis.

4.1. Proportional meta-analysis

The success rate was calculated as proportion and 95% CI for each study, and then data was pooled to derive a pooled proportion and 95% CI. For the purpose of proportion meta-analysis, the proportions were first turned into a quantity (the Freeman-Tukey variant of the arcsine square-root transformed proportion [20,21]) suitable for the usual fixed and random effects summaries. The pooled proportion was calculated as the backtrans form of the weighted mean of the transformed proportions, using DerSimonian weights for the random effects model in the presence of significant heterogeneity.

The fixed effect meta-analysis model is used when all studies are estimating the same (common) treatment effect and there is no between study heterogeneity in the true treatment effect. It assumes that the result of the parameter vary only because of chance differences created from sampling patients. On the other hand, a random-effects model assumes that the result of the parameter can vary across different included studies because of real differences in the treatment effect in each study as well as sampling variability (chance). Therefore in the present meta-analysis, random effect was used as the level of heterogeneity was on the higher side.