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SHORT COMMUNICATION

Mucosal advancement flap for recurrent complex anal fistula: a repeatable procedure

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Abstract

Purpose Mucosal advancement flap (MAF) is the best option for complex anal fistula (AF) treatment. Recurrence is not rare and the best surgical option for his handling is a challenge considering the incontinence risk and the healing rate. We aimed to determine the feasibility and outcomes of a second MAF for recurrent complex AF previously treated with mucosal advancement flap.

Methods We retrospectively identified 32 patients undergoing two or more MAF for recurrent AF in a larger cohort of 121 consecutive cases of MAF operated by the same senior colorectal surgeon. Only complex AF of cryptoglandular origin was enrolled. A long-term follow-up was performed collecting clinical and functional data.

Results Among 121 patients (group A) treated with mucosal advancement flap, 32 (26.4%) (group B) recurred with a complex AF requiring a second mucosal advancement flap procedure. Success rate of group B is 78.1%. Six patients of group B recurred a second time, another MAF was performed with healing in all cases. Complication rate (Clavien Dindo 3b) of group B is 9.4% compared to 8.3% of group A. A slight continence deficit (Miller score 1, 2, and 4) was detected after the first MAF in 3 patients. The Miller score for these patients did not change after the subsequent MAF.

Conclusions MAF is effective for treatment of complex recurrent AF. A pre-existing MAF procedure does not worsen the healing rate of the second flap. The rate of surgical complications is similar with those reported in the literature for MAFs.

Keywords Anal fistula · Mucosal advancement flap · Fistula repair · Cryptoglandular fistula · Surgery for anal fistula

Introduction

Mucosal advancement flap (MAF) is considered an accepted and valuable sphincter-preserving approach for the treatment of complex anal fistula (CAF) [1]. Despite a reported recurrence rate ranging from 6 to 40%, most of these recurrences are probably related to Crohn's disease, recto-vaginal fistulas, or, according to some authors, patients with previous repairs [2–5]. This procedure is considered technically demanding compared to other techniques and is associated with an extremely variable incontinence risk ranging from 0 to 40% [3–7]. Considering the high incidence of anal fistula (AF) and the rate of treatment failure, it is not uncommon for colorectal surgeons to deal with recurrent CAF. Choosing the type of surgical intervention to perform could be challenging considering that previous anal surgery is a possible additional risk factor for recurrence and continence problems [3, 8].

Only few reports document the outcomes of reoperative MAF for complex recurrent AF [9].

The aim of this study is to evaluate the feasibility and outcomes of MAF as redo surgery for recurrent CAF with focus on success and complications rate.

Method

We retrospectively analyzed 121 consecutive patients treated (group A) in our institution by MAF for CAF of cryptoglandular origin from January 2005 to December

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2016. Of the 41 (33.8%) patients who presented with recurrent disease, 32 (26.4%) (group B) were diagnosed as CAF and operated with a second MAF. Six of the 7 (21.9%) (group C) patients presenting a second recurrence underwent a third MAF (Fig. 1).

All patients affected by inflammatory bowel disease or recto-vaginal fistulas were excluded as well as patients with history of perineal radiation therapy or malignancy-associated AF.

AFs are anatomically defined according to Park's classification. All high transsphincteric, suprasphincteric, and intersphincteric crossing > 30% of the external sphincter or horseshoe-shaped AF were classified as complex.

Functional status was evaluated by Miller score system proposed by Miller et al. in 1988 [10]. A post-operative follow-up was performed with clinical controls at 1 and 3 weeks and then monthly until complete healing of the surgical wounds. A phone follow-up was performed for group B and C patients during July 2017. Median follow-up is 74 months (range 8–148 months), with 26 patients (81.2%) having a follow-up longer than 3 years.

Method—surgical technique

A thorough perineal examination is carried out associated with anoscopy and endoanal ultrasonography. If technically feasible, a seton is inserted *and left in place for at least 3 months*. In our opinion, this procedure promotes the development of a solid fibrotic wall around the fistula allowing an easier dissection. After induction of general endotracheal anesthesia, a local anesthesia and a perineal block (ropivacaine 5%, 20 ml) are systematically performed.

The extrasphincteric fistula tract is dissected out from the secondary orifice close to the fistula tract minimizing as much as possible the muscular fiber damage.

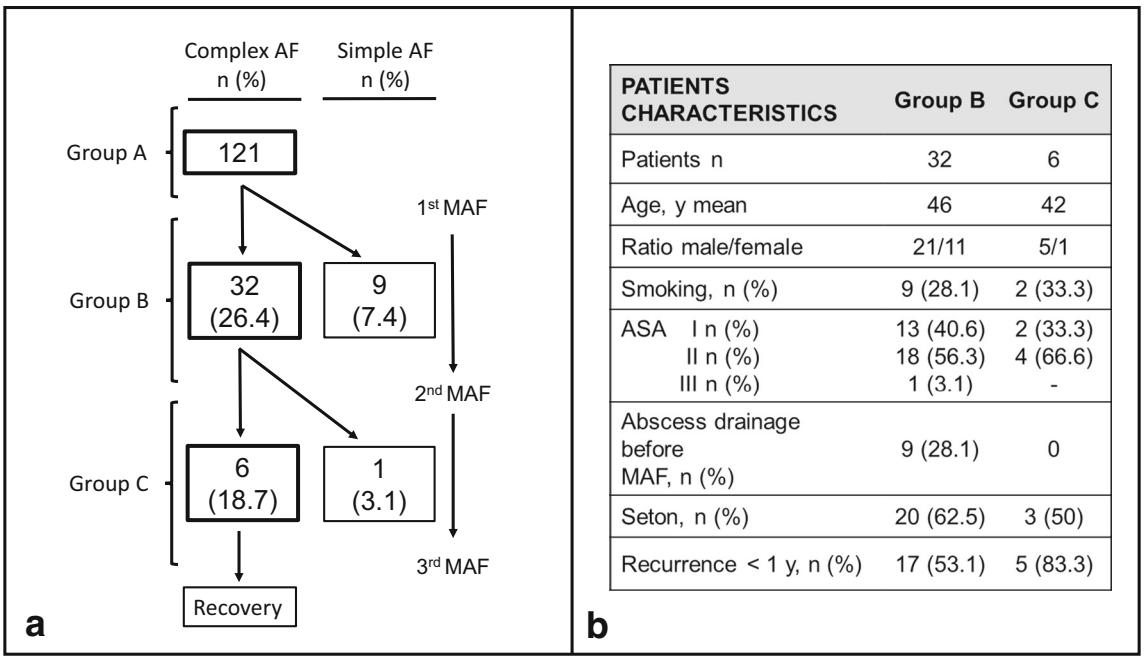
The internal opening of the fistula is exposed, a circular incision is performed on the mucosa, and the submucosal tract in the intersphincteric space is removed at the same time as the crypt-bearing tissue. The inside-out dissection is performed on the cranial side of fistula up to the "rendez-vous" with the outside-in dissection. This minimal transection of the rectal wall enables an inside-to-outside retroversion of the whole fistula track that, in this way, does not need to be sectioned. The defect within the sphincter muscle is closed with two to three monofilament absorbable sutures.

A flap consisting of mucosa and submucosa is raised from the mucosal incision for the internal opening resection and mobilized proximally over a distance enabling the mucosal defect coverage without tension. For this purpose, a distance of no more than 2 cm is usually sufficient. The lip flap is finally sutured to the distal mucosal anodermal resection site by multiple absorbable 3–0-U stitches. The dissection cavity is left open.

Results

Demographics

During the study period, 121 consecutive patients underwent a MAF for CAF (group A). Among those, 41 patients presented a recurrent AF: 9 were classified as simple and 32 (26.4%), classified as CAF (group B), underwent a second MAF.



PATIENTS CHARACTERISTICS	Group B	Group C
Patients n	32	6
Age, y mean	46	42
Ratio male/female	21/11	5/1
Smoking, n (%)	9 (28.1)	2 (33.3)
ASA I n (%) II n (%) III n (%)	13 (40.6) 18 (56.3) 1 (3.1)	2 (33.3) 4 (66.6) -
Abscess drainage before MAF, n (%)	9 (28.1)	0
Seton, n (%)	20 (62.5)	3 (50)
Recurrence < 1 y, n (%)	17 (53.1)	5 (83.3)

b

Fig. 1 **a** Study groups and number of recurrences as complex or simple AF. **b** Characteristics of group B and C participants

Among this group, there were 21 (65.6%) men and 11 (34.4%) women. Patients' demographic and clinical features of groups B and C are summarized in Fig 1. Excluding MAF surgery, the rate of previous anal surgery was 59.9% in group A, 53.1% in group B, and 42.8% in group C; the interventions performed included fistulotomy, fistula plug, or abscess drainage with or without seton drainage insertion.

Success—recurrence

After the second MAF, we observed a success rate of 78.1% with seven recurrences. Among those recurrences, 6 patients were classified as CAF and subsequently underwent a reoperative MAF. The median time between the first and second MAF was 8 months (range 3–24 months). The majority of patients (53.1%) had *the first* recurrence during the first post-operative year. The mean time between the second and third recurrence is 9.3 months (SD 5.8) with 83% of patients recurring in less than 1 year.

Complication rate

After the first MAF, the overall complication rate was 8.3%. We observed one case of bleeding and nine surgical site infections. All cases needed surgical treatment.

After the second MAF, we observed one case of post-operative bleeding requiring surgical control at post-operatory day 0 and two cases of surgical site infections requiring drainage under local anesthesia (Clavien Dindo 3b). In all cases, the evolution was favorable; however, in two patients, a recurrent AF was later diagnosed. The overall complication rate is 9.4%.

For the 6 patients undergoing a third MAF, we reported one case of persisting dead-end fistula close to the surgical wound that required a fistulotomy intervention performed at post-operatory day 12.

Functional outcomes

Concerning group B, at 3 months follow-up, one patient mentioned some gas incontinence scored at 2 and another patient presented a rare liquid stools leakage scored at 4 according to the Miller score. After MAF procedure for recurrent AF (group B), the post-operative control showed unchanged degree of incontinence for both cases. In group C, one patient suffered from rare gas incontinence (Miller score 1) after the first MAF procedure; the second MAF and third surgical intervention did not modify the incontinence score.

Discussion

MAF is a validated sphincter-preserving surgical technique recommended for the treatment of complex AF [1]. Despite a wide range of recurrence rates reported in the literature, most of studies agreed with a success rate ranging from 60 to 93% [3, 4].

The best surgical strategy to adopt in case of recurrent complex AF is still under debate considering the scarce data available on re-treatment outcomes. We present our experience assessing the role of MAF for recurrent CAF. Our global results are in accordance with data previously published [7, 9].

Multiple factors are thought to be responsible for MAF failure. To illustrate, several authors found that previous repair of anal fistula was associated with higher failure rates [3]. Mitalas et al. reported a healing rate of 50% in patients with two or more previous fistula repairs compared to 87% for patients with no or only one previous anal surgery [3]. On the other hand, these results were not confirmed by other groups [4, 7].

In the present study, we report a success rate of 78.1% for patients undergoing a second MAF and 100% of success after a third MAF. According to these results, a pre-existing MAF procedure does not seem to affect the success rate. After two failures, the chance of healing with a third intervention may not be reduced. This result is in accordance with Mitalas and colleagues' findings, who reported a healing rate of 69% after a second MAF [9]. Similar findings were reported by Mizrahi et al. with a success rate of 67% for the second MAF procedure [7]. These results are encouraging considering that the majority of patients undergoing a second MAF had a previous history of AF surgical repair before the first MAF.

In addition, a second or even a third MAF remains a safe procedure with a 9.4% complication rate, which is within the range published in the literature (4.4 to 30%) [11, 12].

Despite being by definition a sphincter-sparing technique, the risk of *in*continence is considered the most important limit before a widespread adoption of the MAF technique. Factors commonly associated with a higher risk of disturbed continence are anal dilatation during surgery, partial and full thickness flaps, and the use of the core out technique [5]. In our series, we report only 3 patients with a limited continence problem. In all the cases, incontinence occurred after the first MAF and redo surgery did not worsen the incontinence score. These findings are in accordance with previous reports [9].

Conclusion

In a tertiary center with colorectal expertise, MAF appears to be a good option for the surgical treatment of recurrent CAF. A pre-existing MAF procedure does not seem to have an impact on the success rate of the subsequent procedures and on the incontinence risk. A clinical history of MAF should not be considered a contraindication for a repeat MAF.

Compliance with ethical standards

For this type of study, formal consent is not required. This article does not contain any studies with animals performed by any of the authors.

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

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