# Experience with Staged Mucosal Advancement Anoplasty for High Trans-sphincteric Fistula-in-Ano

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## ABSTRACT

*Successful eradication of a complicated, recurrent fistula-in-ano with maintenance of anal continence, requires a specialized surgical approach. Mucosal advancement anoplasty is associated with acceptably low rates of recurrence and continence and is reported in this small series of 11 patients where it followed preliminary deployment of a loose guiding and drainage seton. The technique was also supplemented by internal anal sphincter repair at the time of the advancement anoplasty. Success was achieved in nine cases without any effect on reported continence.*

# Experiencia con la Anoplastia por Avance de Colgajo de Mucosa Para la Fístula Anal Transesfintérica

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## RESUMEN

*La erradicación exitosa de la fístula anal complicada, recurrente, con mantenimiento de la continencia anal, requiere un abordaje quirúrgico especializado. La anoplastia por avance de colgajo de mucosa esta asociada con tasas aceptablemente bajas de recurrencia y continencia, y se reporta en esta pequeña serie de 11 pacientes, en la que a continuación se produjo el uso preliminar de un sedal (setón) de drenaje y laxo de guía. La técnica fue también complementada por la reparación del esfínter anal interior en el momento de la anoplastia de avance. Se logró éxito en nueve casos sin efectos sobre la continencia reportada.*

## INTRODUCTION

The vast majority of fistulae-in-ano do not require specialized surgical treatment (1) being able to be successfully managed by simple fistula excision (2). Mucosal advancement anoplasty has been devised to eradicate high fistulae whilst preserving anal continence (3) although following its use there is a moderate incidence of recurrence and of separation of the mucosal suture line (4, 5). Moreover, there is debate concerning the necessity of internal sphincterotomy as part of the procedure to permit adequate drainage (6) and its effect on postoperative continence outcome (7). Since 2002, our unit has adopted a specific strategy for the management of recurrent or primarily high trans-sphincteric cryptogenic anal fistulae which incorporates an initial draining seton insertion followed by formal mucosal advancement anoplasty at three months with internal anal sphincter preservation and repair (8). We report our results over this time of a consecutive unselected patient series managed by this surgical strategy.

## PATIENTS AND METHODS

Between May 2002 and December 2005, 18 patients were referred with recurrent, high cryptogenic trans-sphincteric fistulae-in-ano as defined by a fistula track which incorporated more than one-third of the coronal length of the internal and external anal sphincter (9). All fistulae were defined anatomically in accordance with the Parks' classification as intersphincteric, trans-sphincteric or extrasphincteric (10) with supplementation by routine endoanal ultrasonography, transperineal sonography and examination under anaesthesia (11, 12). Patients were treated according to this protocol with details taken regarding age, gender, prior surgery and pre-operative continence status as defined by Jorge and Wexner (13). One patient with perianal Crohn's disease and 2 patients with recto (ano-) vaginal fistulae were excluded from analysis along with 4 patients who had sufficient migration of their seton during follow-up so that they could be treated by simple fistulectomy alone. This provided

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11 patients for medium-term assessment and analysis. After clinical and endosonographic assessment of the patient in the outpatient clinic, those cases deemed suitable for an endoanal advancement flap were submitted to this procedure between 10–12 weeks following seton placement. Postoperative continence was assessed prospectively at six months after the definitive procedure with 'cure' defined when there was no clinical evidence of an external fistula opening and no symptoms of anal discharge. Fistula persistence was defined as failure of closure of the external opening or persistent anal discharge in the presence of an external opening with a new fistula being defined as evidence of an extra track or sinus away from the treated primary fistula site.

## RESULTS

Patient characteristics of the 11 patients analyzed in this study are shown in Table 1 (mean age 47.5 years; range

Follow-up showed complete healing (as defined) in nine patients (81.8%) with one patient developing an ano-vaginal fistula four months after surgery and one patient failing to heal the primary fistula track and developing a secondary ischiorectal sinus at eight months. The former patient was subsequently unsuccessfully treated with a Martius bulbospongiosus graft 6 months later and then managed with a graciloplasty and diverting stoma some four months after that. The latter case was treated successfully on nine months follow-up with a rehydrated Surgisis® fistula plug (Cook Biotech AFP[TM] Bloomington, IN) and remains asymptomatic at six months after plug deployment. No patient experienced any measurable symptomatic effect on continence. One further patient experienced evacuatory difficulty at six weeks which persisted and which required an examination under anaesthesia, revealing a mucosal bridge in the mid-anal canal requiring simple division.

Table 1:   Patient characteristics of the staged mucosal advancement anoplasty protocol

| Patient Number | Sex | Age (years) | Previous Number Operations | Fistula type | Healing | Follow-up (months) | Preoperative Continence Score* | Postoperative Continence Score* |
|---|---|---|---|---|---|---|---|---|
| 1. | M | 48 | 2 | TS | yes | 8 | 20 | 20 |
| 2. | M | 62 | 3 | TS | yes | 10 | 20 | 20 |
| 3. | M | 32 | 3 | TS | yes | 22 | 17 | 16 |
| 4. | M | 34 | 3 | ES | no¶ | 42 | 20 | 20 |
| 5. | F | 34 | 4 | TS | no | 29 | 15 | 16 |
| 6. | M | 70 | 1 | TS | yes | 14 | 20 | 18 |
| 7. | F | 44 | 2 | ES | yes | 11 | 20 | 20 |
| 8. | F | 43 | 3 | ES | yes | 40 | 20 | 20 |
| 9. | F | 66 | 2 | TS | yes | 13 | 20 | 20 |
| 10. | F | 28 | 3 | TS | yes | 28 | 16 | 16 |
| 11. | M | 61 | 3 | TS | yes | 35 | 20 | 20 |

\* Wexner Continence Score (Reference 13);  ¶ Failure to heal;  Φ New fistula
TS = Trans-sphincteric fistula;  ES = Extrasphincteric fistula

28–70 years; 6 males, 5 females). An example of endoanal and axial transperineal hydrogen peroxide-enhanced ultrasound images in a patient with a high extrasphincteric fistula are shown in Figures 1a and 1b. The median number of prior operations in patients was three with an average period of presentation to our clinic after the last anal surgery of 14 months. The median follow-up was 20 months (range 8–42 months). Three patients reported mild continence disturbance prior to advancement flap surgery (Table 1). Figures 2a–d show the operative procedure with formal internal and external anal sphincter repair creating the mucosal advancement using 2/0 vicryl sutures. The superficial cutaneous wounds were routinely left open after the external anal sphincter repair was buried. No patient was treated with a diverting stoma and all procedures were performed with formal bowel preparation using three litres of GoLYTELY (polyethylene glycol; PEG 3350) on the day before surgery. All patients were routinely catheterized.
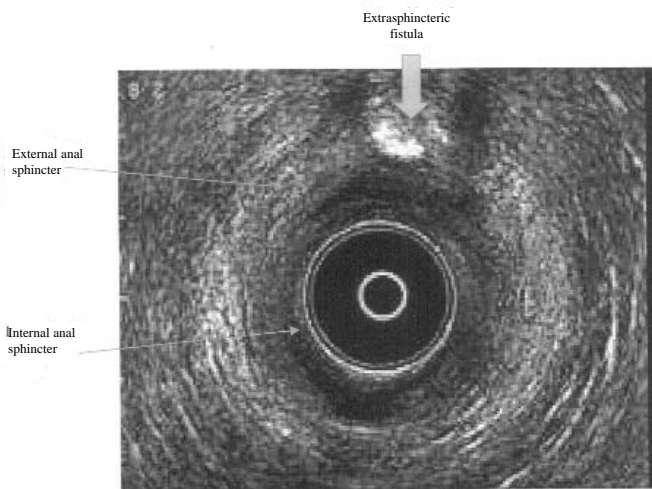


Fig. 1a:  Hydrogen peroxide-enhanced axial endoanal ultrasound showing an extrasphincteric anal fistula (arrowhead).
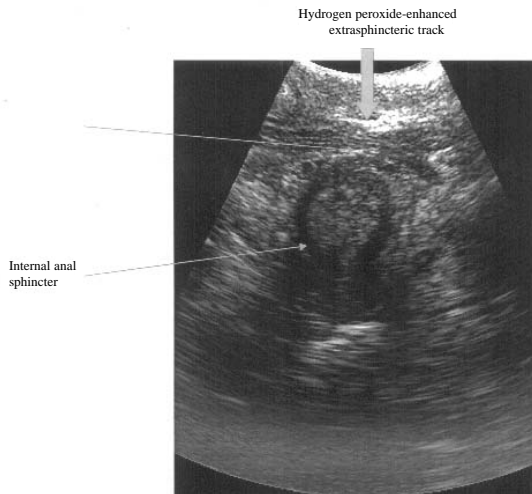
Fig. 1b: Hydrogen peroxide-enhanced transperineal ultrasound of the same patient showing the fistula transgressing the external anal sphincter (arrowhead).
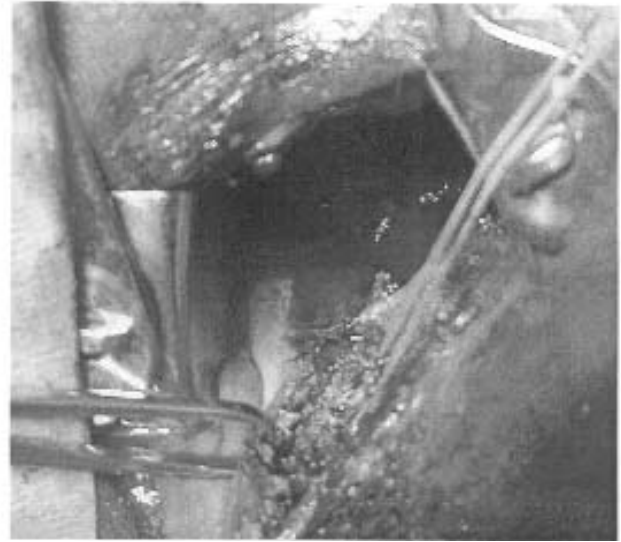


Fig. 2c: The external anal sphincter is also repaired with 2/0 vicryl.
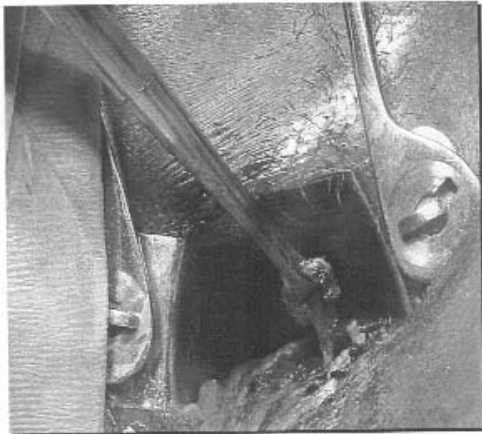


Fig. 2a: Operative appearances of the mucosal advancement anoplasty with internal and external anal sphincter repair. The fistula is being dissected through the internal anal sphincter. The blue seton is evident as a guide for dissection.



Fig. 2d: Completed mucosal advancement.



Fig. 2b: A 2/0 vicryl suture is shown for internal anal sphincter repair.

## DISCUSSION

The data show that a staged surgical approach to high and recurrent fistula-in-ano in which the fistula has a loose seton deployment followed three months later by definitive repair with an endoanal mucosal advancement and primary internal anal sphincter repair, is successful on medium-term follow-up without a deleterious effect on continence. Several factors have previously been outlined which are responsible for fistula recurrence, including failure to delineate the internal fistula opening (14), fistula complexity, horseshoe formation and the grade of surgeon. Similarly, predictors for faecal incontinence after fistula surgery have been outlined including the presence of a high internal opening and lateral extensions (15, 16). Latterly, advancement anoplasties have been used by coloproctologists to reduce fistula recurrence, either as a mucosal flap (3, 5, 17) or as a cutaneous advancement (18),

with evidence to show that the presence of fistulating Crohn's disease rather than prior surgery, fistula type or supplemental bowel diversion is most predictive for mucosal anoplasty failure (19).

The data are supported by a higher previously reported rate of success where preliminary seton deployment is used (20), although the seton may not be successfully used as a definitive treatment alone (21). Cuting seton usage as definitive therapy in high fistula-in-ano can have a significant deleterious effect on long-term continence (22) and may be associated with a significant incidence of recurrent sepsis (23). The routine use of a preliminary seton in these fistulae also provides a valuable road-map for the second stage excision of the internal opening. The mucosal advancement technique in our study was unassociated with any significant functional disturbance, although we did not assess pre- and postoperative manometry. This finding has also recently been reported by Uribe and colleagues (24) where there were no specific predictors after this surgery for postoperative incontinence.

Equally controversial is the role of preliminary internal sphincterotomy at the time of advancement anoplasty in order to provide adequate drainage, where closure at the point where the fistula crosses the internal anal sphincter has been shown by some to be associated with a higher incidence of fistula recurrence (6, 25). Our group previously has shown a high success rate with primary internal anal sphincter repair, rerouting the preliminary seton through the intersphincteric space. This has resulted in manometric improvement in resting anal pressures (an internal anal sphincter function) although no specific improvement in medium-term continence (7, 8). There is no evidence to suggest an advantage of proximal bowel diversion when using an endoanal mucosal anoplasty, except in complicated perianal Crohn's disease (26) and equally, the routine use of postoperative bowel confinement has no proven beneficial effect in this surgery (27).

The success of this formal staged approach has been recently reported by others (28) where an almost identical protocol was used, with the suggestion that a minimum of 10-12 weeks between procedures is desirable to permit initial drainage of sepsis and to initiate fibrotic healing of the primary track. This has been supported by the recent use of a bioabsorbable xenograft plug of lyophilized porcine intestinal submucosa (Surgisis® Cook Biotech Bloomington, IN) which produces minimal giant cell reaction and which disappears over three to six months (29, 30) although others have shown less granulation tissue with setons or sealants when compared with simple curettage (31). This technique was used in one patient in our series where the staged technique was unsuccessful because endoanal scarring precluded a second attempt at mucosal surgery.

More prolonged follow-up of our patients and a larger overall experience will most likely show a higher incidence of delayed fistula recurrences, where others have reported recurrence rates varying between 3–40% using mucosal anoplasty techniques (17, 28, 32). In the future, we will use the technique for patients with perianal Crohn's disease, a disorder which is notably uncommon in the Caribbean (33), as well as in ano- and rectovaginal fistulae (20). More intensive pre-operative imaging, particularly using magnetic resonance imaging will define those patients with significant collections where advancement anoplasty is better delayed (34) and there may be advantage in the selective use of antibiotic instillation beneath the mucosal flap (35).

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