

Anorectal Sepsis: Abscess and Fistula

To paraphrase Professor John Goligher who produced his enduring book for surgeons which was literally the 'Bible' of coloproctology, [Goligher 1980] "it is more difficult to operate on a complex recurrent fistula than a rectal cancer". Phillips and Lunniss from St. Mark's Hospital who some years later wrote a definitive text on anal fistula management accepted that some degree of fecal incontinence was the price paid by many patients for fistula cure [Phillips and Lunniss 1995]. Against this background, the scenario has dramatically changed over the last 20 years, as shown by Herand Abcarian and his unit from Chicago where in the 1990's they laid open 80% of fistulae but where by 2010 they reported that a sphincter saving procedure was performed in 80% of their cases [Dudukgian and Abcarian 2011]. Patients are generally more afraid of incontinence than they are of recurrence which explains why novel sphincter saving procedures are evolving including the Ligation of the Inter-sphincteric Fistula Track (LIFT), fistula plug insertion, injection treatments of autologous centrifuged fat, adipose-derived stem cells [Herrerros et al. 2012] or biocompatible glues, the Video-Assisted Anal Fistula Treatment (VAAFT) and laser fistula ablation, along with other new technologies. Older surgeons, who previously just had to choose between a fistulectomy with a cutting seton and a fistulotomy, may be overwhelmed by the bewildering array of operative choices currently available. Despite these advances, however, with initial successes many of these clever strategies fail over time with durable success rates that settle around 50% over the medium- to longer-term as shown by Altomare et al. reporting results from a prospective multi-center Italian study of fibrin glue (Tissucol) [Altomare 2011].

Fistulotomy and curettage can be performed for low trans- and inter-sphincteric fistulae and fistulectomy can be supplemented by a rectal mucosal flap advancement which is successful in 70-80% of the cases, so that these alternatives should be part of the armamentarium of the modern colorectal surgeon. Even simpler methods, such as the lay-open of high fistulae and the direct closure of the fistula opening following a fistulectomy can be successful and are able to preserve continence in most cases [Athanasiadis et al. 2004; Atkin et al. 2011]. My preference is for a hybrid partial excision of the fistula track and then a straight-forward inner lay-open fistulotomy. This technique permits the recognition of the sphincters where the latter part of the method ensures that minimal muscle is divided. As I learned from Sir Alan Parks, it is also valuable to

divide the lower part of the internal anal sphincter so as to adequately drain the intersphincteric plane which in 70% of the cases is the site of the primordial abscess. What I don't do, however, is to rigorously search for the internal opening if it is not obvious. If I can't find it, it may be obliterated or simply absent, (a hematogenous and not a crypto-glandular infection), so that I don't take the risk of iatrogenically creating a false opening by injudiciously pushing a probe towards the suspected crypt. I routinely perform marsupialization of the surgical wound as it reduces the size of the defect, diminishes the risk of perioperative bleeding and ensures a faster convalescence without increasing the postoperative pain. It is also a technique that is recommended in the guidelines of the Association of Coloproctology of Great Britain and Ireland (ACPGBI) [Williams et al. 2007]. Contrarily to Robin Phillips, I think that preoperative anal ultrasonography using a rotating endoanal probe and selective magnetic resonance (MR) imaging are often useful in assessing the anatomy of the sepsis prior to surgery, even if I dedicate the first phase of the operation to a careful digital assessment.

It is important to tailor the operation to the individual patient and to the position of the fistula. A young male is at much less risk of postoperative incontinence than a multiparous female and the lay-open of an anterior fistula is more likely to cause incontinence than a posterior fistulotomy. There are certain ground rules in the performance of a mucosal advancement anoplasty. Here, the rules of plastic surgery apply so that suture line tension is avoided and so that there is adequate vascularization of the flap. In this regard, the shape of the flap should be like a "lip" and not a "tongue"; namely that the base of the flap should be wider than its length. The flap should comprise rectal mucosa, submucosa and a bit of muscle so as to ensure more strength (and vascularity) to the anoplasty. The flap is better raised using either a knife or scissors rather than diathermy in order to avoid ischemia of the edges and so as to reduce the risk of dehiscence [Kodner et al. 1993]. The rectal flap should not be sutured to the anal skin, (to the anal verge), in order to avoid a mucosal ectropion (the so-called Whitehead deformity) which results in a "wet anus" with some degree of soiling and seepage. Instead, the suture line should be placed inside the anal canal, although not too low where it can be "protected" by the distal end of the internal sphincter to ensure satisfactory continence [Lagares-Garcia et al. 2002].

The construction of a rectal flap following fistulectomy is contraindicated when there is frank pus in the operative field, (i.e. in cases with an associated acute abscess) and also when there is active proctitis as may happen in some cases of Crohn's perianal fistulae. When the above mentioned criteria are strictly followed, one may expect a success rate of 70-80% with mucosal advancement anoplasty. In case of failure however, (i.e. where there is a wide flap dehiscence after fistulectomy), a cutting seton may be inserted under local anesthesia in the office after having divided the skin and dermis below the seton exit point just outside the anus.

Anorectal Sepsis: Abscess and Fistula

One fistula is almost never exactly identical to another and the presence of deep sepsis may contraindicate the use of most of the exciting innovations. Included in this (and other) chapters is the management of a rectovaginal fistula. In this chapter, simple direct repair is presented. For rectovaginal fistula, there are a myriad of approaches with a moderate (20% or more) expected rate of failure after the first procedure. The outcome for these patients is worse in those with Crohn's disease and also depends on whether the fistula is low or high, or large or small and on the presence or absence of active proctitis. The surgical approach is also dependent upon the underlying fistula etiology and the presence of associated weakened sphincters where an endoanal repair is contraindicated. The range of options include transanal, perineal, transvaginal and even transcoccygeal approaches, as I have listed in my book *Prevention and Treatment of Complications in Proctological Surgery* [Pescatori 2012].

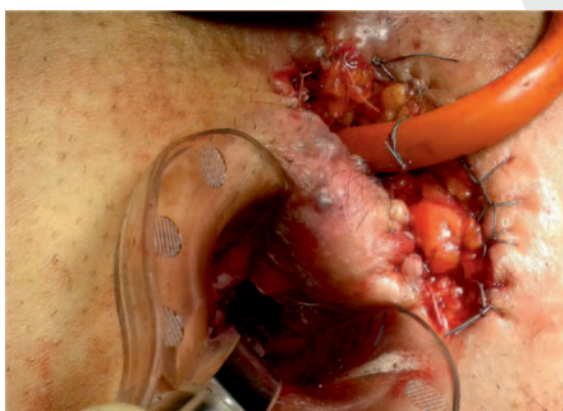
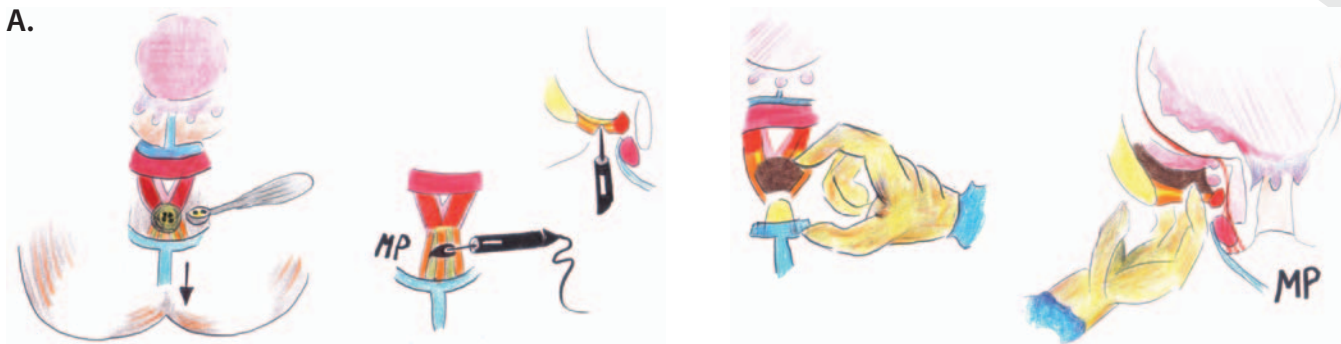
Finally, many studies have reported that an operation for complex fistula is more likely to be successful in the hands of a specialist, where it is advised that a general surgeon may well just position a draining seton and send the patient to an accredited colorectal surgeon with extensive experience of fistula management.

CHAPTER 1 ANORECTAL SEPSIS: ABSCESS AND FISTULA

- 1.1.** ANATOMY OF THE PERIANAL AND ISCHIORECTAL SPACES
- 1.2.** FISTULECTOMY, FISTULOTOMY AND MARSUPIALIZATION
 - 1.2.1. Fistulotomy and abscess excision.
 - 1.2.2. Primary suture of the internal fistula opening
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- 1.6.** RECTOVAGINAL FISTULA MANAGEMENT

1.1. ANATOMY OF THE PERIANAL AND ISCHIORECTAL SPACES

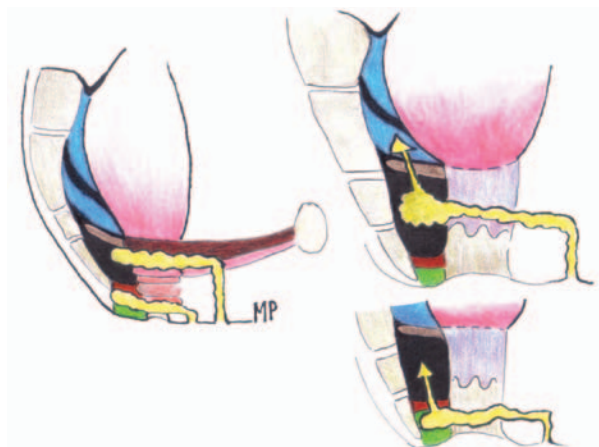
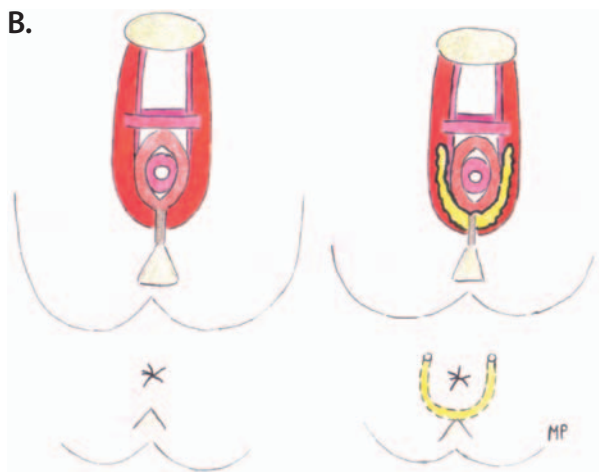
A.



- A. An abscess may extend into the retrorectal space requiring formal drainage through the levator plate with placement of a translevator DePezzer catheter as shown in an operative image. The schematic image shows sectioning of the anococcygeal ligament for entry into this space.

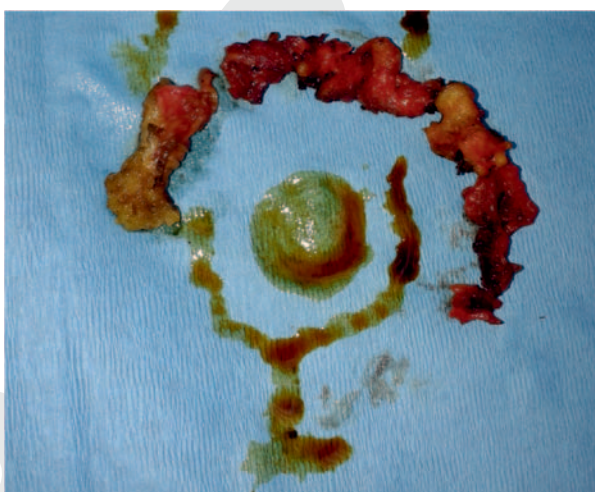
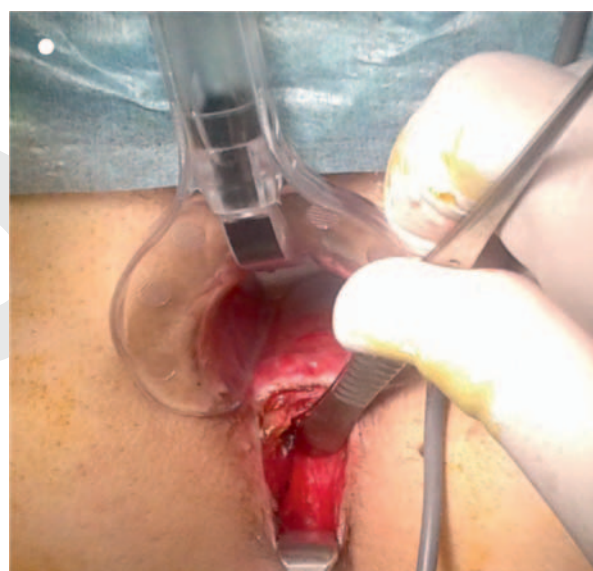
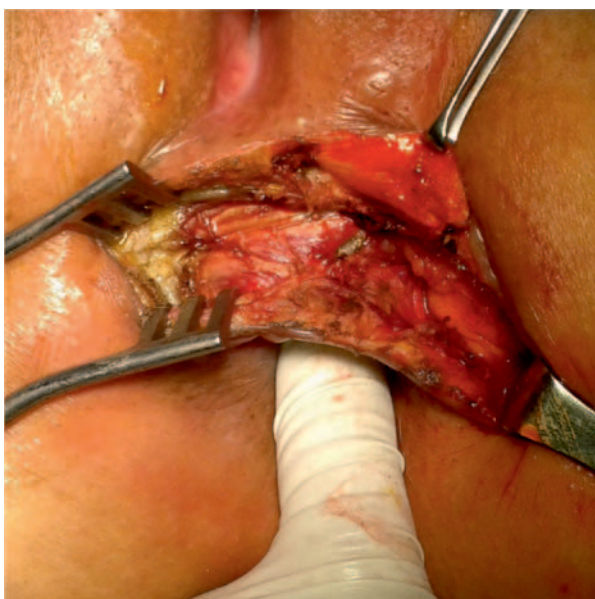
Schematic Legend: (*Top Left Image:* Superficial part of the external sphincter: “V”-shaped red. Deep part of the external sphincter: pink. Ano-coccygeal ligament: dotted yellow-orange. Coccyx: yellow. Retractors: blue. *Top Right Image:* Palpation of a deep abscess - brown).

B.



- B.** The operative images show anterior horse-shoe formation with dissection of the anterior intersphincteric plane which communicates with the ischiorectal space (*Top Left and Top Right*). The technique of opening the retroanal space for sepsis is shown (*Bottom Left and Bottom Right*).

C.



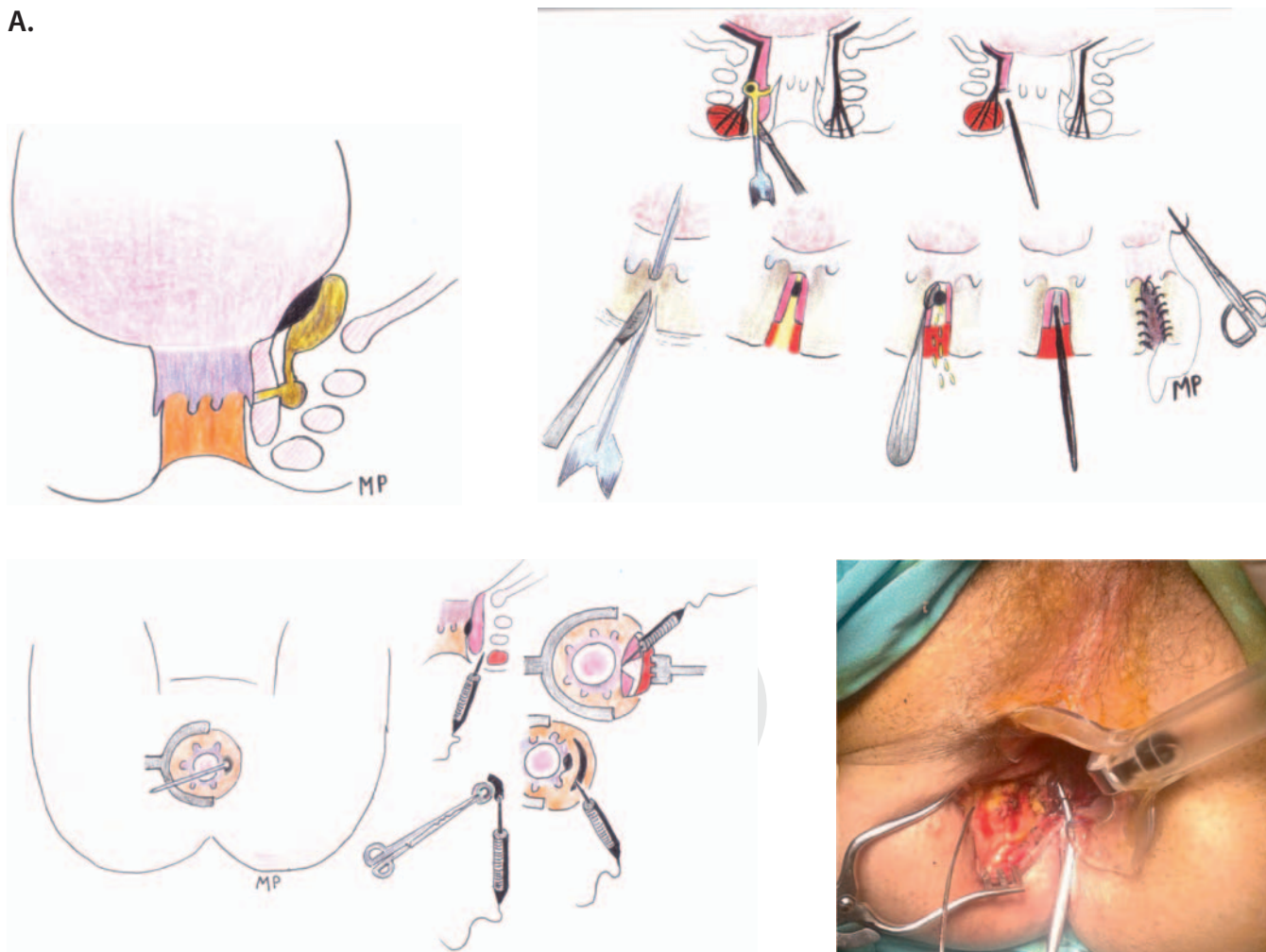
C. Operative images of the anatomy of the antero- and retroanal abscesses is made with specimens of excision sent to the pathologist.

Comment: The surgeon should avoid opening up a communication between a diseased and an intact space as this maneuver is likely to extend the septic process.

1.2. FISTULECTOMY, FISTULOTOMY AND MARSUPIALIZATION

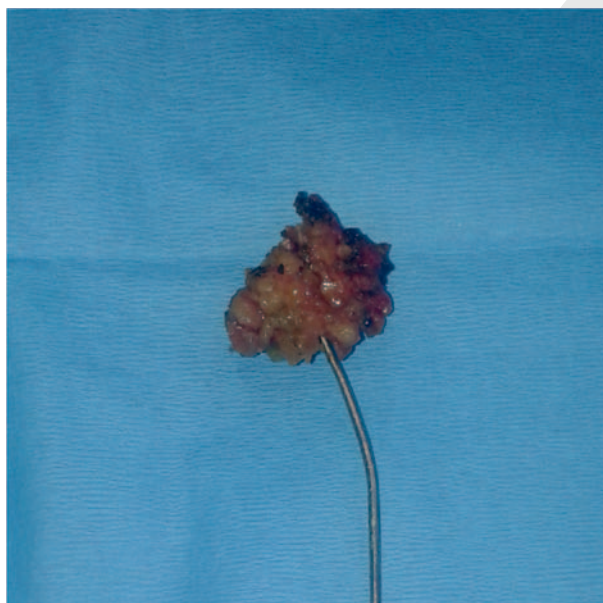
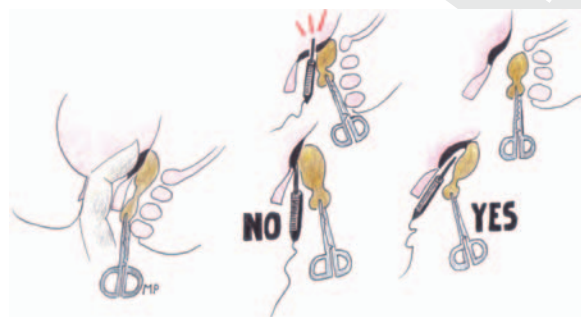
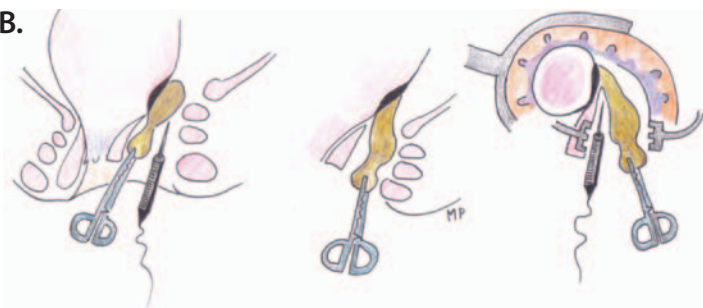
1.2.1. Fistulotomy and abscess excision.

A.



- A. Intersphincteric dissection is carried out for an intersphincteric collection with partial fistulotomy and fistula curettage. The internal anal sphincter is typically divided in order to provide adequate drainage. The corresponding operative photograph shows entry into the perianal space.

B.



- B. By staying in the plane of the abscess wall, in some cases formal abscess excision can be performed. No attempt is made to excise the abscess at this point as it may lead to inadvertent rectal perforation leaving the rectal fibrosis intact. The photograph confirms formal abscess excision.

C.

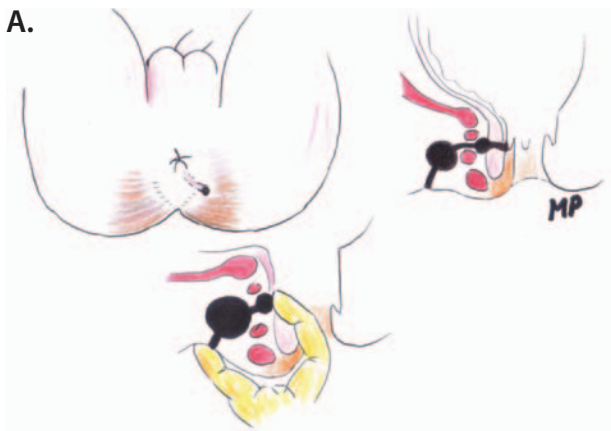


C. In those cases where abscess excision is not feasible the wound may be marsupialized

Comment: In case of a high intersphincteric fistula without an external opening, I would advise caudal extension for 2-3 cms outside of the anal verge which ensures better drainage and permits easier irrigation of the cavity.

- 1.2.2.** High trans-sphincteric fistula with an ischiorectal abscess managed by abscess drainage, fistulectomy with primary suture of the internal fistula opening.

A.



A. Abscess drainage and commencement of the fistulectomy.

B.

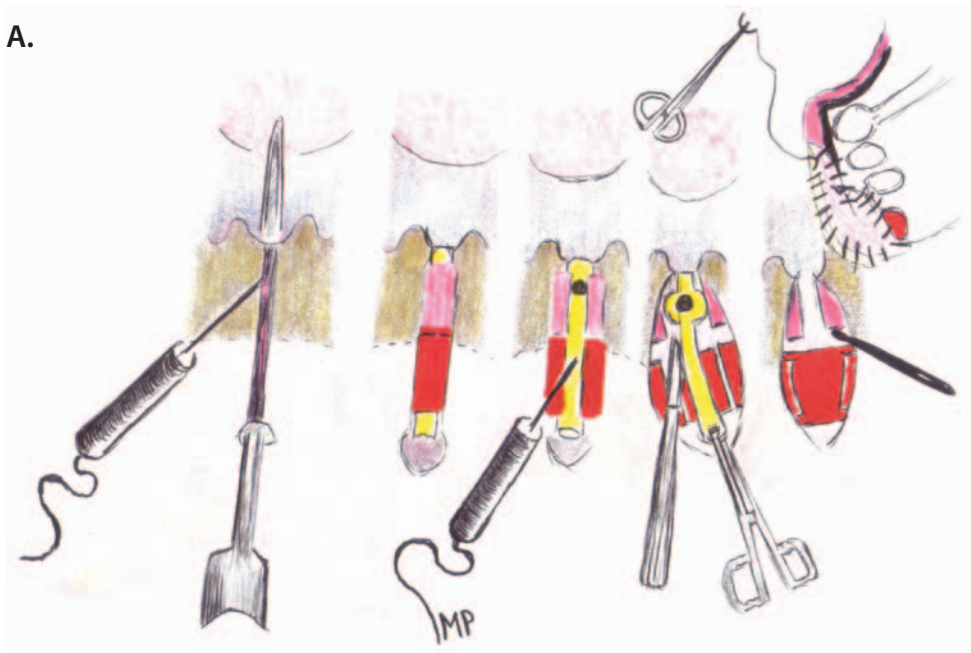


- B.** The internal opening is directly closed. The wound may either be packed or marsupialized depending upon its size. The technique of direct suture of the internal fistula orifice is patterned after that described by Athanasiadis, Greece.

Comment: Suture dehiscence is more likely to occur with a single-layer closure of the internal fistula orifice.

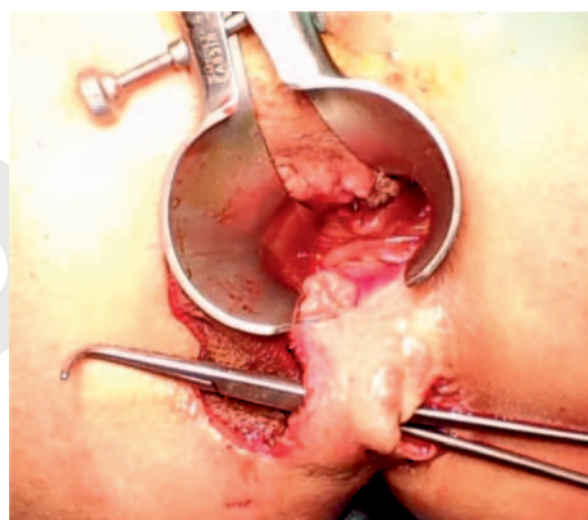
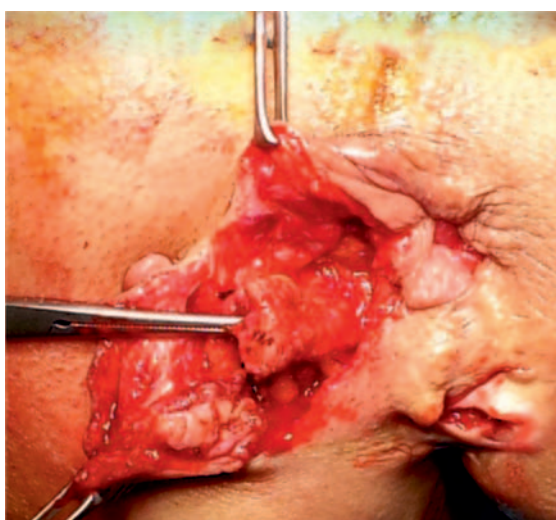
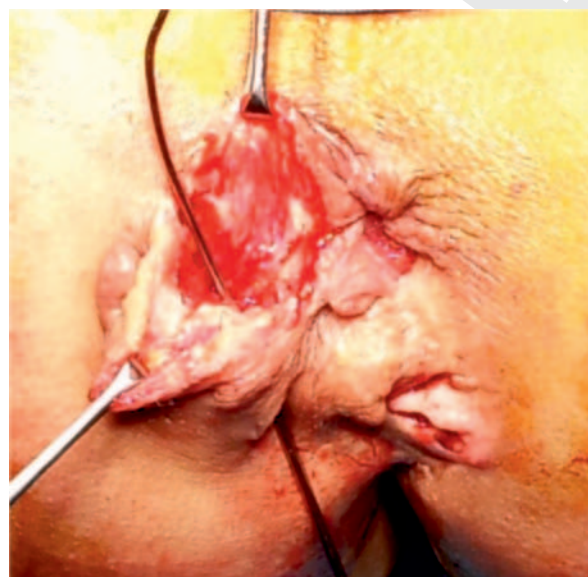
1.2.3. Hybrid fistulectomy plus fistulotomy.

A.



- A. The distal superficial part of the fistula is treated with a fistulotomy to reduce muscle division and the deep inner portion is precisely excised as a fistulectomy. In the schematic case the wound is marsupialized which speeds healing and reduces the risk of postoperative bleeding.

B.



- B.** Operative images are shown of the technique for a ramifying fistula with multiple external openings and a horse-shoe component. The top left image shows a 36-year old male with a complex horse-shoe fistula. The top right image shows a deep fistulectomy. The bottom left image shows a superficial fistulotomy and the bottom right image shows communication between the ischiorectal and postanal spaces.

Comment: I learned the principles of this approach from Sir Alan Parks. In this setting, the intersphincteric track crosses the subcutaneous part of the external anal sphincter crossed by the distal fibers of the longitudinal muscle (Parks' *corrugators ani*). When dealing with patients with weak sphincters at risk of postoperative incontinence, it is better not to perform a straight-forward fistulotomy as it might completely divide the subcutaneous portion of the external anal sphincter and affect anal continence. A hybrid fistuotomy-fistulectomy is also useful when dealing with low fistulae where the anatomy is unclear, permitting a decision intraoperatively of either completing the fistulotomy or converting it into a fistulectomy where the amount of sphincter to be divided may be visualized and palpated.

1.3. SETON POSITIONING, REPOSITIONING AND FISTULA RE-ROUTING

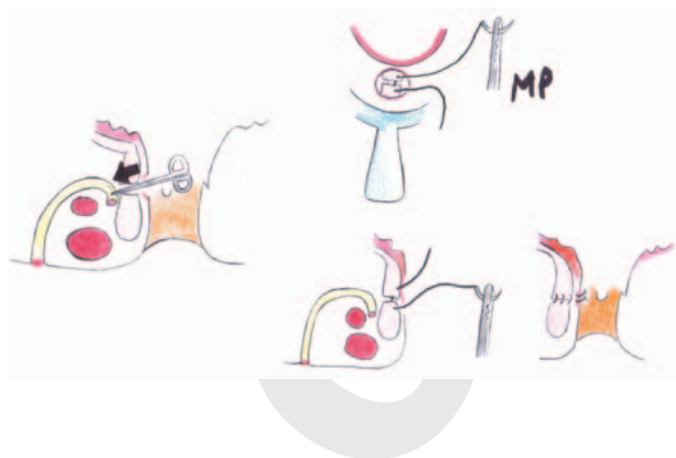
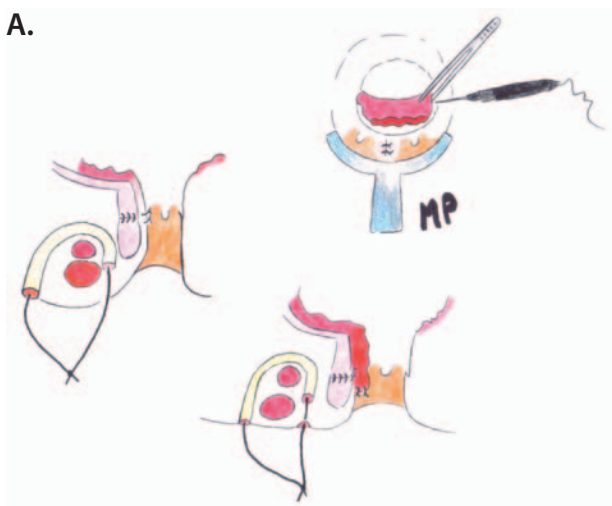
1.3.1. Seton Insertion



After drainage of the abscess (*top left*) a finger in the rectum identifies the induration around an internal fistula opening (*top right*). An eyelet probe is inserted into the fistula (*bottom left*) and a seton is brought through (*bottom right*).

1.3.2. Seton Railroading and Hybrid Seton Use For A Horse-shoe Fistula.

A.



- A. A pre-existing seton passed across a high trans-sphincteric fistula is cut and tied to a silk suture (*Top Left*). This is pulled through the fistula using a railroad technique (*Top Right*). The fistula is curetted and irrigated (*Bottom Left*). The suture is tied to a new seton which is positioned across the fistula (*Bottom Right*).

- B.** The modified Hanley procedure using a hybrid seton fashioned from a surgical glove as described by Leventoğlu, Turkey in 2013. The operative photograph shows dual seton use for a high complex trans-sphincteric horse-shoe fistula after initial perineal excision for necrotizing fasciitis.



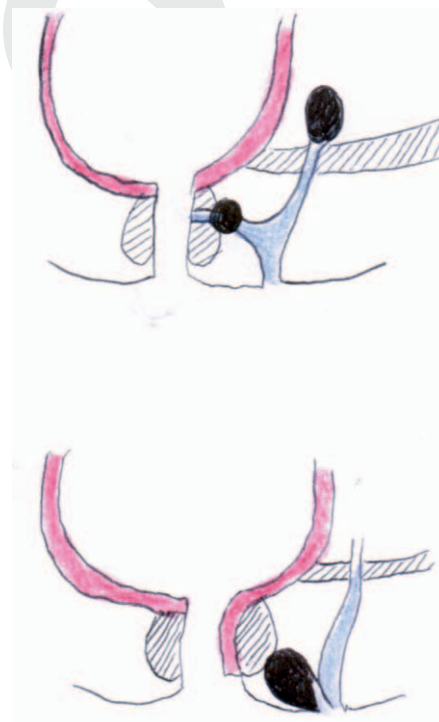
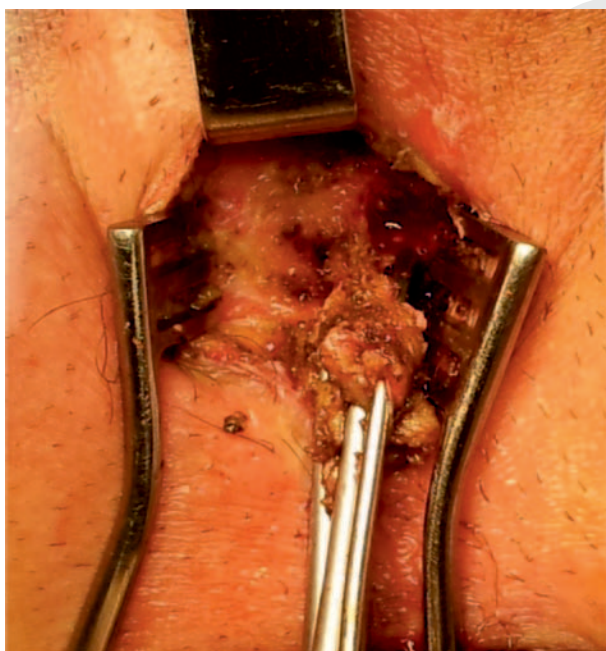
1.3.3. Fistula Re-routing Procedure.



The internal opening is isolated and closed with a mucosal advancement flap. The seton is rerouted through the intersphincteric space with formal repair of the internal anal sphincter. If the seton is used as a cutting seton or divided, the healthy internal anal sphincter below the internal opening is left intact in an effort to preserve continence. The technique was described by Zbar from Australia.

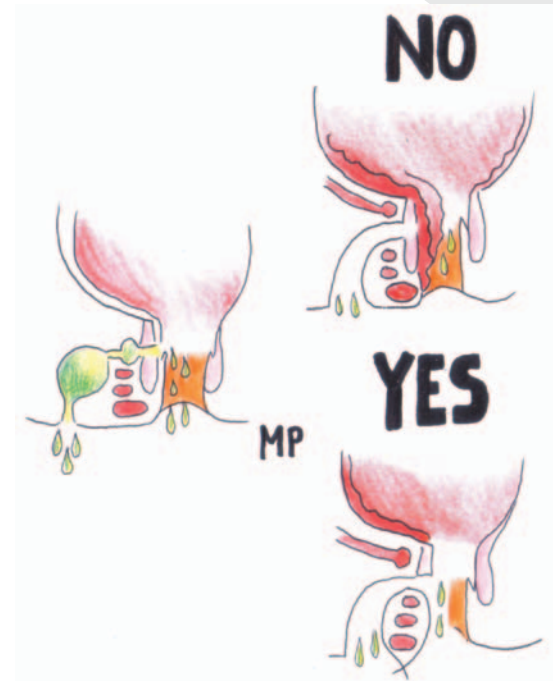
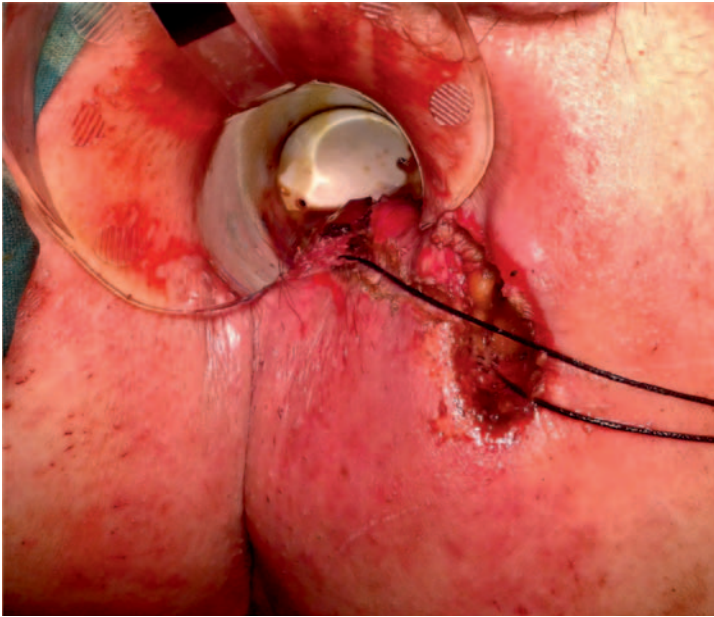
1.4. MUCOSAL ADVANCEMENT ANOPLASTY

A.



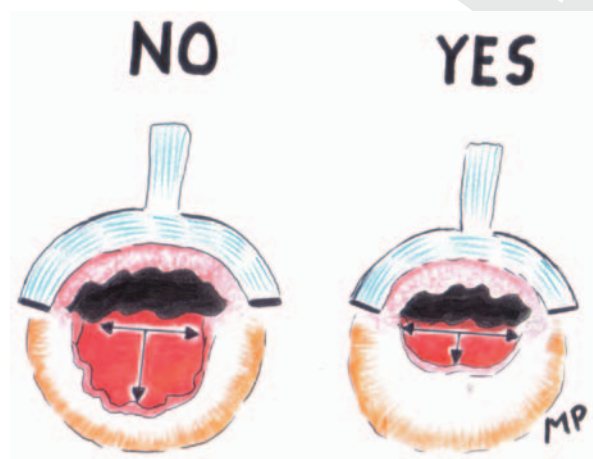
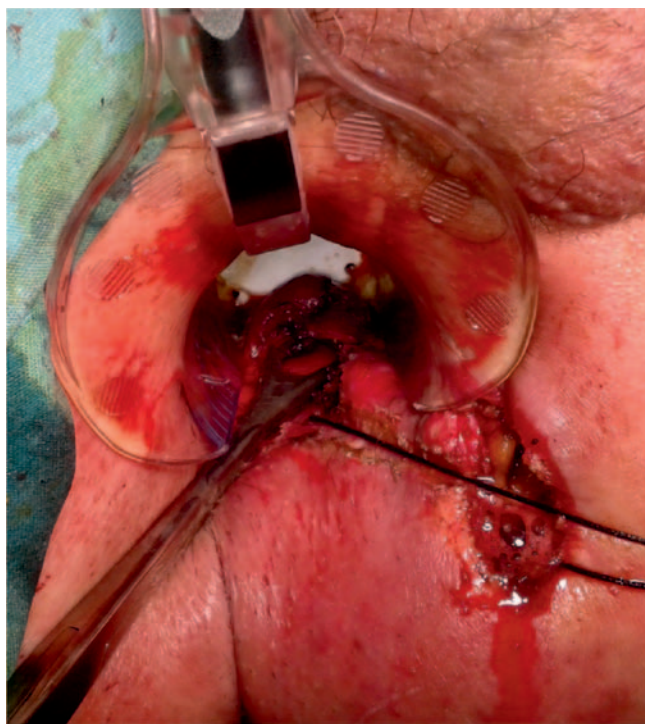
- A. The operative images show commencement of dissection of a high trans-sphincteric fistula. The schematic image shows the relevant anatomy of the fistula with a translevator extension.

B.



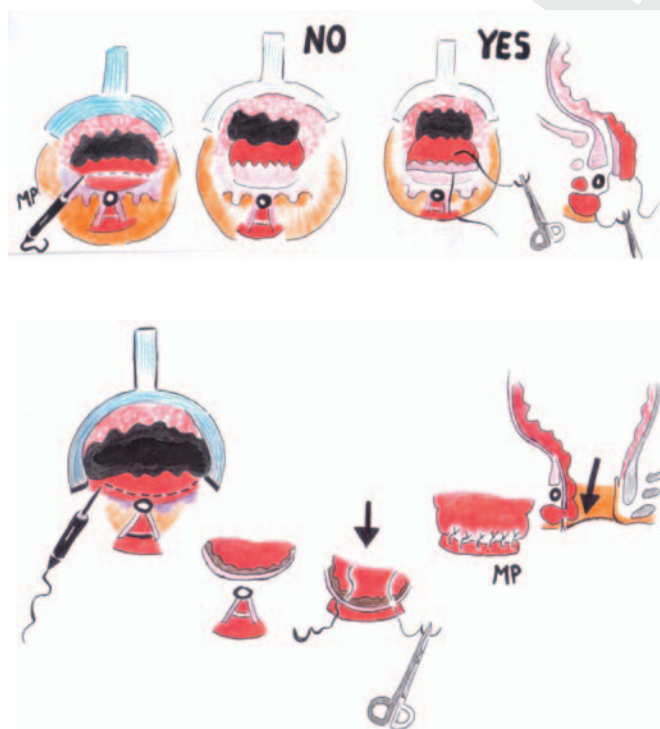
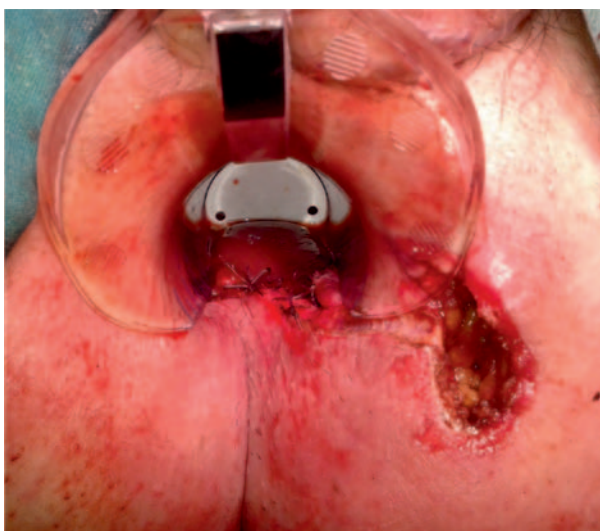
- B.** The operative image shows identification of the internal fistula opening and responsible crypt with seton insertion. The schematic images show the correct approach via an intersphincteric dissection (YES). High dissection may result in a suprasphincteric fistula or an iatrogenic rectal opening (NO).

C.



- C. Commencement of the mucosal flap which should be twice as wide as it is long in order to remain viable and to prevent delayed dehiscence.

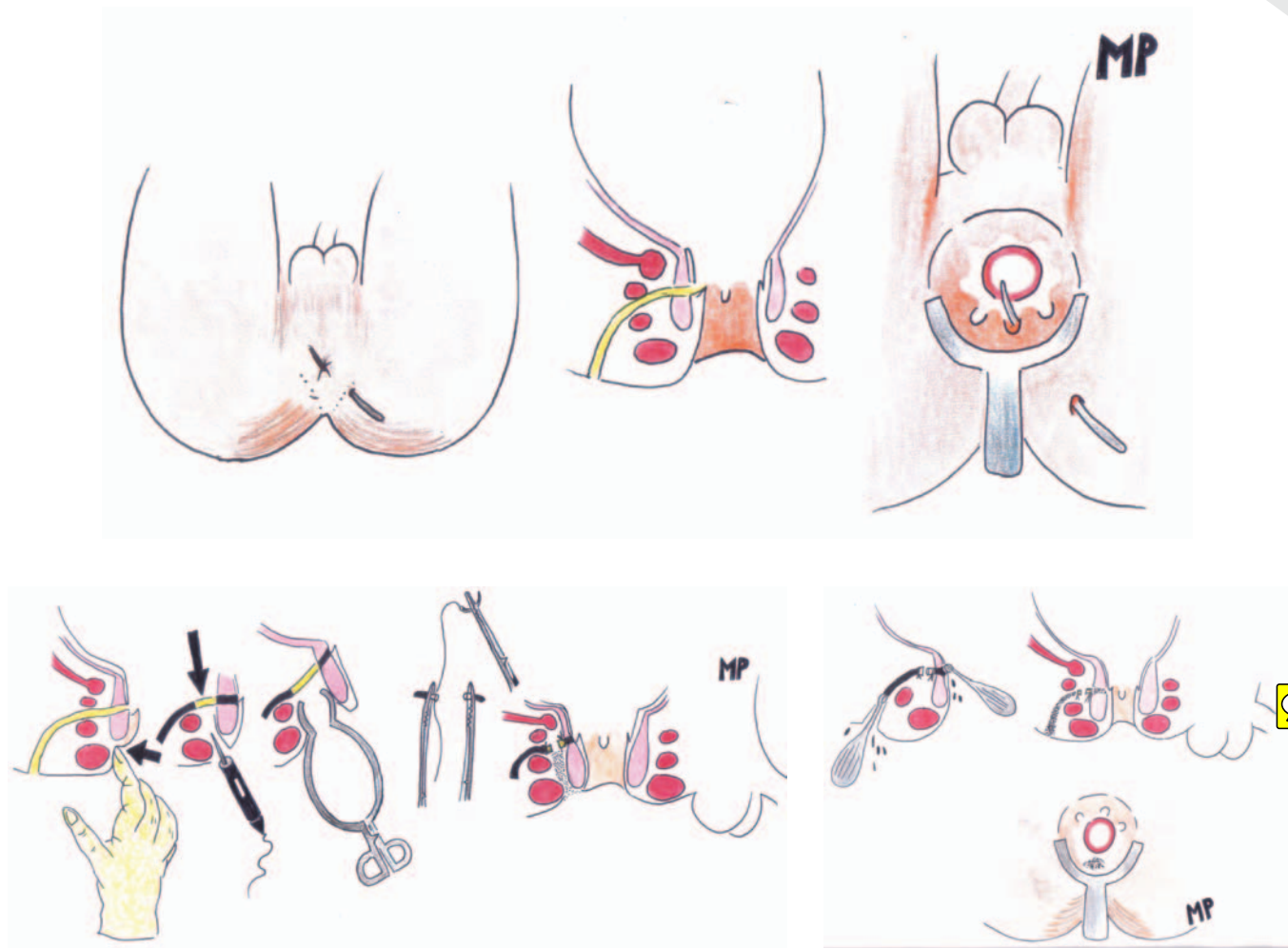
D.



- D. The flap is sutured to the subcutaneous part of the external anal sphincter above the anal verge so as to avoid creation of a mucosal ectropion which results in a persistently wet anus. Although debated, a more durable flap is established with a small amount of internal anal sphincter muscle.

Comment: A perianal skin flap is also a viable alternative option where there is a diseased and inflamed rectum provided that it is harvested in an area free of anal Crohn's lesions. A mucosal flap is not fashioned if there is a significant concomitant abscess or active proctitis where a seton is initially placed instead.

1.5. LIGATION OF THE INTERSPHINCTERIC FISTULA TRACT (LIFT)



The *Top* image shows probing of a high trans-sphincteric fistula. The *Bottom Left* image shows the intersphincteric approach to the fistula for identification and ligation. The inner aspect of the fistula can drain internally without need for an advancement anoplasty. The external wound is left open for drainage in the immediate postoperative period.

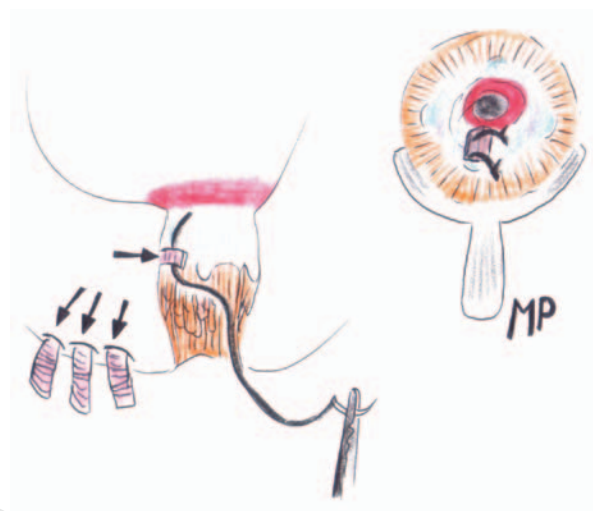
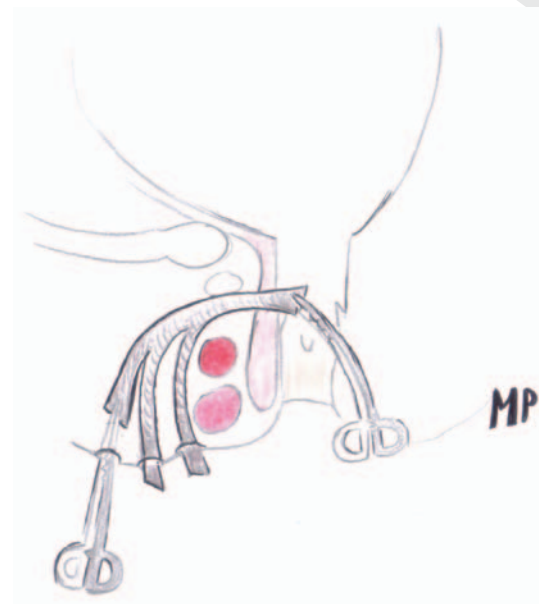
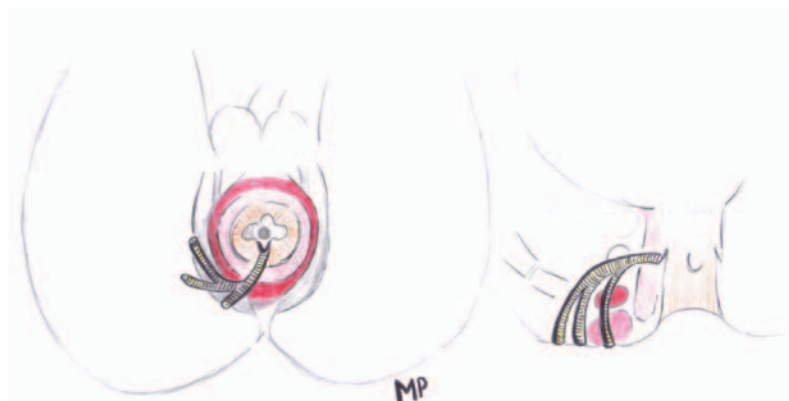
Comment: Although originally invented by Robin Phillips but popularized by the Thai surgeon Arun Rojanasakul, the LIFT procedure is likely to become the "workhorse" of complex anal fistula surgery. Its longer-term results will define its place in complicated fistula management.

1.6. FISTULA ABLATION

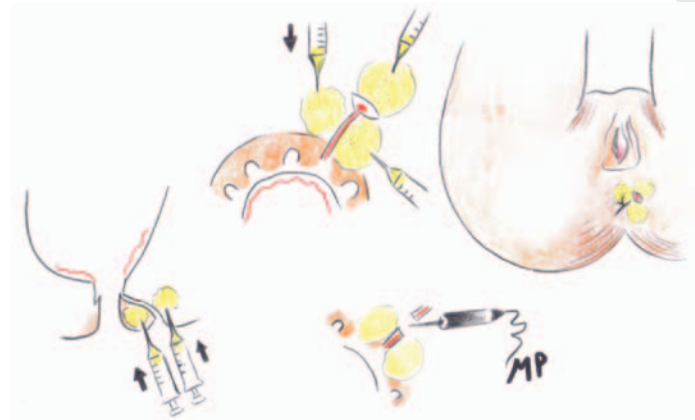
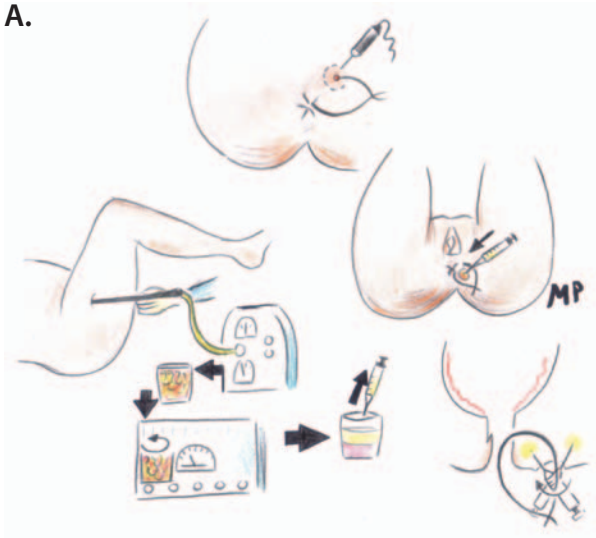
- 1.6.1.** Fibrin glue instillation. The fistula is initially washed out and may be cleaned using a brush. Commercially available glue (Tissucol® Baxter, USA) is prepared by mixing the main component with a catalyst using a double-channel injector until a bed of sealant is formed at the internal opening. The excess glue at both the internal and external opening is removed.



1.6.2. The Anal Fistula Plug



The complex high trans-sphincteric fistula has three external openings. After initial curettage of the fistula tracks individually, the fistula is railroaded so as to pull through the anal fistula plug(s) (CookTM). The plug is secured at the internal opening to prevent migration with 2/0 Vicryl.

1.6.3. Autologous tissue instillation.**A.**

- A.** This may include fat harvested by liposuction from the buttock which after centrifugation can be instilled directly into the fistula.

B.



- B. An alternative is direct instillation of platelet-rich derived plasma into a complex fistula with multiple openings after initial seton insertion. This technique has been reported by van der Hagen et al. in 2011.

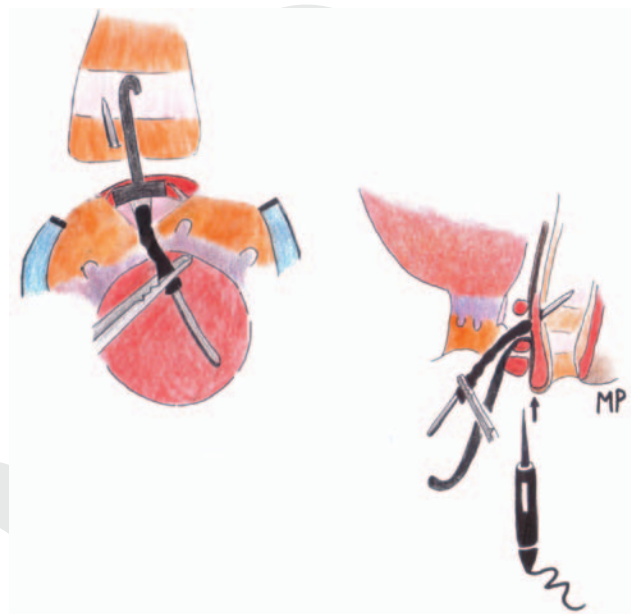
1.6.4. Video-Assisted Anal Fistula Treatment (VAAFT).



The technique was developed by Meinero of Italy. It consists of insertion of a straight rigid scope which is positioned to straighten the fistula track until it reaches the internal fistula opening. The internal opening is then isolated with sutures and the fistula track is ablated with an endoscopic diathermy electrode. The sutures at the internal opening are then lifted to create a “volcano” effect which can be supplemented by instillation of cyanoacrylate glue and then stapled with a ContourTM 30 mm or a laparoscopic GIA (Ethicon) stapler depending on the fistula position.

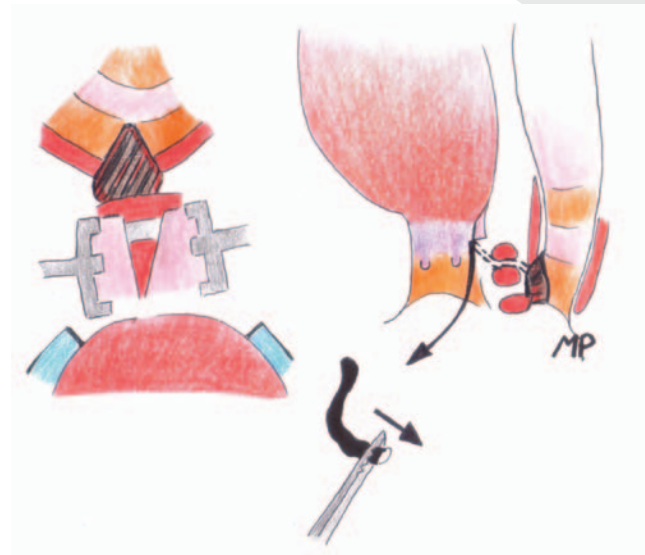
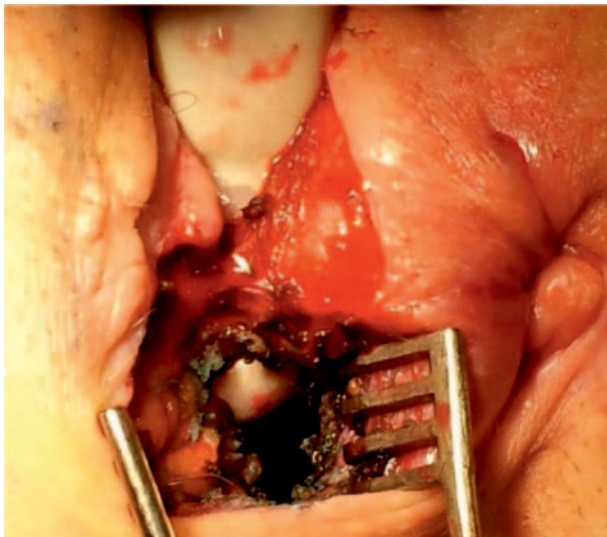
1.7. RECTOVAGINAL FISTULA

A.



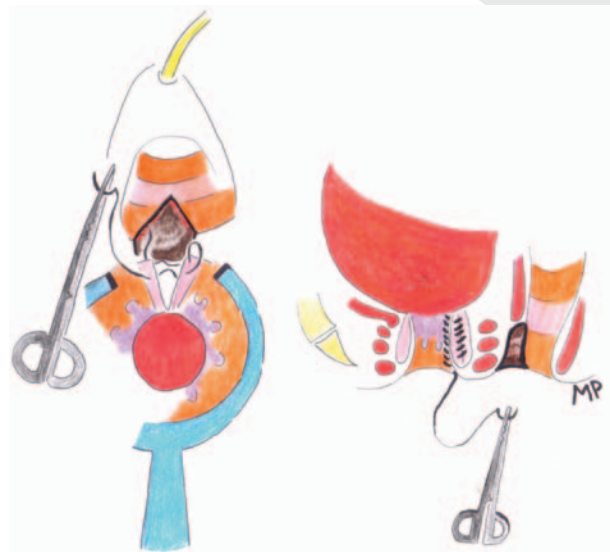
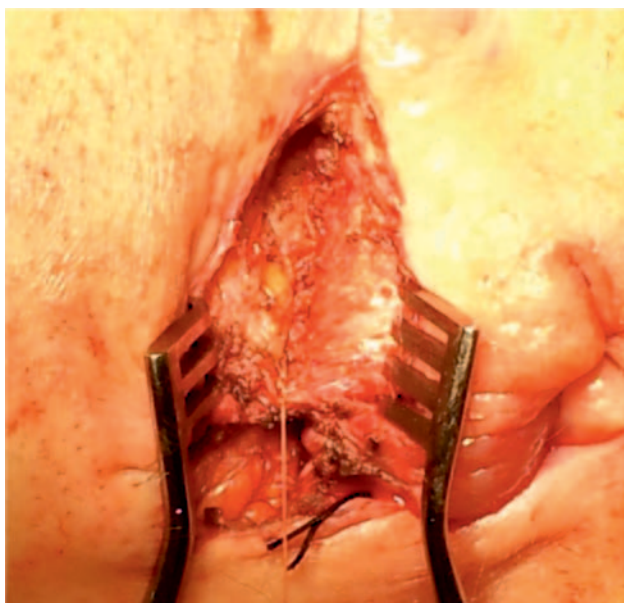
- A. Case of a 63-year old lady presenting with a rectovaginal fistula and connecting external fistulae. The operative images show initial dissection of the main fistula on the vaginal side.

B.



- B.** The operative image shows a finger in the vagina confirming a sizeable rectovaginal fistula which is treated with formal fistula excision. The schematic image shows the anatomy of the fistula excision.

C.



C. The fistula is closed in layers.

