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ORIGINAL ARTICLE

Fistulotomy or seton in anal fistula: a decisional algorithm

Andrea Cariati

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Abstract Fistula in ano is a common proctological disease. Several authors stated that internal and external anal sphincters preservation is in the interest of continence maintenance. The aim of the present study is to report our experience using a decisional algorithm on sphincter saving procedures that achieved us to obtain good results with low rate of complications. From 2008 to 2011, 206 patients underwent surgical treatment for anal fistula; 28 patients underwent perianal abscess drainage plus seton placement of trans-sphincteric or supra-sphincteric fistula (13.6 %), 41 patients underwent fistulotomy for submucosal or low inter-sphincteric or low trans-sphincteric anal fistula (19.9 %) and 137 patients underwent partial fistulectomy or partial fistulotomy (from cutaneous plan to external sphincter muscle plan) and cutting seton placement without internal sphincterotomy for trans-sphincteric anal fistula (66.50 %). Healing rates have been of 100 % and healing times ranged from 1 to 6 months in 97 % of patients treated by setons. Transient fecal soiling was reported by 19 patients affected by trans-sphincteric fistula (11.5 %) for 4–6 months and then disappeared or evolved in a milder form of flatus occasional incontinence. No major incontinence has been reported also after fistulotomy. Fistula recurred in five cases of trans-sphincteric fistula treated by seton placement (one with abscess) (1/28) (3.5 %) and four with trans-sphincteric fistula (4/137) (3 %). Our algorithm permitted us to reduce to 20 % sphincter cutting procedures without reporting postoperative major anal incontinence; it seems to open an interesting way in the treatment of anal fistula.

Keywords Anal fistulas · Cutting seton · Fistulotomy · Anal sphincters · Anal incontinence

A. Cariati (✉)
General Surgery, San Martino, IST Hospital, Via Fratelli Coda 67/5 a, 16166 Genoa, Italy
e-mail: andrea.cariati@libero.it

Introduction

Anorectal abscess and fistula in ano are common proctological diseases. Reported fistula-in-ano incidences have been of 1.04/10,000 in Spain and of 2.32/10,000 in Italy [1]. Lower incidences (nearly 8.4/100,000) have been reported in Finland and in USA [2, 3]. The most widely accepted theory is that anal abscess belongs to the infection of an anal crypt gland. Suppuration moves from the anal gland to the inter-sphincteric space forming an abscess leading to the development of a fistula. The incidence of fistula following an abscess is of nearly 33 % [4–6]; but when accurately studied an internal fistula tract can be found in nearly 80 % of the cases [7]. Fistulas are commonly divided into: submucosal; inter-sphincteric; trans-sphincteric (high or low with less of 30 % of external sphincter involvement); supra-sphincteric and extra-sphincteric. Treatment options of fistula-in-ano include fistulotomy, seton placement, endorectal advancement flap, dermal island flap, fistula plug, fibrin injection and ligation of the inter-sphincteric tract [8]. Surgical treatment of fistula-in-ano is dictated by the amount of sphincter involvement and several authors stated that internal and external anal sphincters preservation is in the interest of continence maintenance [8–10]. In fact, in the last 25 years the percentage of sphincters cutting procedures has been decreased from 98 % to 50 % [8]. Although there are still

surgeons that prefer an extensive use of complete fistulectomy and fistulotomy in both high and low anal fistulas reporting an overall postoperative incontinence rates of 30–35 % [11]. The aim of the present study is to report our experience using a decisional algorithm on sphincter saving procedures that achieved us to obtain good results with low rates of anal incompetence and fistula recurrence.

Material and method

From 2008 to 2011, 206 patients underwent surgical treatment for anal fistula in the Colon-Recto-Anal Surgical Unit of San Martino Hospital in Genoa; 28 patients underwent perianal abscess drainage plus double setons (one drainage seton and one cutting seton) placement of trans-sphincteric or supra-sphincteric fistula (following the fistulous tract and placing the seton drainage according to Goodsall-Salmon law) (13.6 %), 41 patients underwent fistulotomy for submucosal or low inter-sphincteric or low trans-sphincteric anal fistula (we used this technique only for very low fistulas with <10 % of external anal sphincter involvment) (19.9 %) and 137 patients underwent partial fistulectomy or partial fistulotomy (from cutaneous plan to external sphincter muscle plan) and cutting seton placement without internal sphincterotomy for high trans-sphincteric anal fistula with more than 10 % of external anal sphincter involvement (66.50 %) (Tables 1, 2). MRI or CT scan has been done only in Crohn's disease patients (one woman and two men) and in complex fistulas. In patients with acute anal abscess and high fistula, antibiotics (metronidazole and third generation cephalosporin) have been administrated for 1 week starting at the time of diagnosis; operation have been done within 24–36 h. Mean operative times were of 22 or 24 or 26 min, respectively. In all of the cases, a particular attention has been done in preserving internal anal sphincter and in reducing the extent of external anal sphincter division. Spinal (epidural) anesthesia has been done in 93 % of the patients (191/206). Fifteen patients (7 %) underwent general anesthesia. One-day procedure was done in 77 % of the cases (159/206) and 47 patients underwent a mean 3 days of hospitalization; these last group of patients comprised the patients with anal abscess and high fistula accepted by the emergency department (28 cases) and 19 patients with high fistula and associate diseases as cardiorespiratory diseases or Crohn's disease.

With the term healing we refer as the closure of the wound. We usually do not check the healing with ultrasound or MRI; we perform ultrasound or MRI in case of recurrence or in the suspect of a Crohn's disease or in complex fistula with possible communication with urinary bladder or vagina.

Median follow-up have been of 30 months (range 12–60 months).

Results

Acute abscesses and sepsis have been successfully treated in all patients (100 %). Drainage setons have been used only among abscess group (28/206) and they have been removed after 2 or 3 weeks when the pus drainage have been terminated. Cutting setons have been used in all other cases as indicated (137 + 28/206) (80 %). Cutting setons have been tightened meanly three four times during a mean period of 1–3 months. No mortality has been reported. Healing times ranged from 1 to 6 months in 97 % of patients treated by setons (the 3 % need more time) and in 100 % of patients treated by fistulotomy. Healing rates have been of 100 % for both techniques considering the 3 % of patients treated with setons that experienced the healing of the wound after 9–12 months (Table 2). During the first postoperative days a mild form of incontinence was common probably because we use, before the insertion of the operative anoscope a mild anal stretching similar to those used for anal fissure [12]. Transient fecal soiling have been reported by 19 patients affected by trans-sphincteric fistula (11.5 %) for 4–6 months and then disappeared or evolved in a milder form of flatus occasional incontinence. No major incontinence has been reported also after fistulotomy because we used this technique only for subcutaneous or low inter-sphincteric or low trans-sphincteric anal fistulas with less of 10 % of external sphincter involvement. Fistula recurred in five cases of trans-sphincteric fistula treated by seton placement: one patients have been affected by anal abscess (1/28) (3.5 %) and four patient have been affected by high trans-sphincteric fistula (4/137) (3 %). Results have been reported in Tables 1 and 2.

Discussion and conclusion

The utility of cutting setons have been well-established but in some large case series have been reported to use this procedure in <10 % of the cases [13]. Using our algorithm the indication for the insertion of a cutting seton have been wider (80 %). Our efforts were advocated to obtain the treatment of the fistula with the minimal internal and external sphincters damage. The wide use of setons permitted us to respect the majority of internal and external muscular sphincters fibers involved by fistula-in-ano. Setons are useful in the treatment of trans-sphincteric anal fistula because they permit the drainage of acute inflammation and preserve anal sphincters damages. The decisional algorithm (Table 2) is: complete fistulotomy for

Table 1 Surgical treatment of fistula-in-ano

Author	Technique	Patients n°; follow-up	Recurrence	Minor incontinence	Major incontinence
Christensen et al. [19]	Seton for high fistula	21; follow-up 24–168 months	0	62 % (minor and major)	See all incontinences
Pearl et al. [17]	Staged fistulotomy	116; follow-up 2–61 months	3 %		5 % major
Van Tets et al. [22]	Staged fistulotomy	34; follow-up 60 months	6.5 %	17 % minor; 38 % mild	3.5 % major
McCourtney et al. [14]	Seton + respect internal sphin	27; follow-up 60 months	4 %	19 %	
Hämäläinen et al. [18]	Seton	44; follow-up 28–184 months	6 %	63 %	
García-Aguilar et al. [16]	Staged fistulotomy	59; follow-up 27–33 months	8 %	50 %	25 %
Vial et al. [15]	Seton + respect internal sphin	448; follow-up review	5 %	5.6 %	
Cariati et al. [unpublished data]	Seton + respect internal sphin	165; follow-up 12–60 months	3 %	11.5 % flatus transient	0
Chuang-Wei et al. [13]	Seton complex fistula	112; follow-up 38.6 months	0.9 %	18.6 % flatus	5.4 % liquid stool
Atkin et al. [11]	Fistulotomy	180; 5 months	3–4 %	30 %	6–10 %

Recurrence and incontinence rates. Follow-up

Table 2 Anal fistula. Decisional algorithm

Diagnosis at recto-anal inspection, confirmed intra-operatively	Low anal fistula <10 % of external anal fistula involvement	High anal fistula >10 % of external anal sphincter involvement	Anal abscesses with high (>10 % sphincter invol) anal fistula
Number of patients	41 cases (19.9 %)	137 cases (66.50 %)	28 cases (16.6 %)
Immediate antibiotics administration	no	no	yes
Complete fistulotomy or fistulectomy	yes	no	no
Partial fistulectomy plus insertion of a silk cutting seton	no	yes	yes
Insertion of a second large band silicon drainage seton	no	no	yes
Healing rates at 6 months	100 %	97 % (100 % at 12 months)	97 % (100 % at 12 months)
Persistent major fecal incontinence	no	no	no
Persistent use of sanitary pads	no	no	no
Recurrence (follow-up 12–60 months)	0 %	3 %	3.5 %

subcutaneous, low inter-sphincteric or very low trans-sphincteric fistula (less of 10 % of external sphincter involvement) (we used this technique only in very low fistula, in selected cases); cutting seton insertion (with partial fistulectomy or partial fistulotomy) without cutting the external and the internal anal sphincter and to prosecute with a carefully seton traction during the next months in trans-sphincteric fistula (with more of the 10 % of sphincter involvement); the incisional drainage plus the double setons (drainage and transection setons) placement in perianal abscesses with high fistula. This decisional algorithm allows us to reduce to 20 % sphincter cutting

procedures (Table 2). Literature data on the use of setons in anal fistula reports a 4–5 % rate of recurrence [14, 15] and a 0–5 % rates of incontinence [14, 15] that are acceptable complication rates. We avoid the two-stage seton procedures with fistulotomy that may have a 66 % reported minor and major incontinence rate [16]; the reported major incontinence of 5 % by Pearl et al. [17] is probably related to a selective application of this technique only for those patients with a partial (<30 %) external and internal sphincters involvement; in fact, a major (more of 50 %) one or two stages division of the external anal sphincter is always related with minor and/or major incontinence rates of 14–63 % [18, 19], 12–18 % [20] 39 % [21] and 58.6 % (17 patients over a group of 29) [22] (Table 1). Our results are probably also related to the intensive ambulatory follow-up that we offered to our patients. Seton patient subgroup was followed every 2 weeks and seton tightening has been done every 2 or 3 weeks but never less. This accurate postoperative management required patience and a good cooperation patient/physician but paid with quite good results. In fact no major anal incontinence has been reported by our patients at ambulatory follow-up. It is questionable if our wide use of cutting setons is strictly necessary, in fact other authors used this technique only in complex fistula and reported air and liquid stool incontinence in 18.6 and 5.6 % of the cases, respectively [13] but they did not report fistulotomy results for non-complex fistulas that used in most of 90 % of the cases. Moreover, an extensive use of fistulectomy or of fistulotomy for high anal fistula has an overall reported incidence of incontinence of the 40 % [11] with an operation-induced incontinence of the 14 %. In our opinion these rates of incontinence are unacceptable especially when they are the result of deliberate anal sphincters damage. In fact when Atkin et al. [11] compare the operation-induced incontinence rates for the treatment of high fistula by fistulotomy versus seton insertion report a 6 versus 0 % rates of soft and hard stool incontinence. Other surgical procedures have been used and proposed for anal fistula; in particular the fistulectomy with the closure of the internal opening [23] seems to be an interesting technique (recurrence of 2 %). The main limit of this procedure is that, in the hands of other surgeons, this has a reported higher incidence rates of complications and recurrences. In fact, Jivapaisarnpong [24] have reported 13 % rates of recurrence without incontinence and Khafagy et al. [25] have reported rates of recurrences of 10–40 % and reported rates of postoperative complications of 5–30 %. These last data compared with our casuistry results, obtained with a simple use of a rationale algorithm, appear of difficult understanding. In conclusion, our suggestions are very prudent but the minimal surgeon induced sphincters damage preserve a better quality of life after fistula healing. Finally, our algorithm is more conceptual and less technical and it is easy to follow by all surgeons; it is in accordance with one of the major recent literature review about anal fistula surgery [26] with only one difference: we prefer to use the term very low trans-sphincteric fistula when <10 % of external anal sphincter is involved in order to limit the use of complete fistulotomy or fistulectomy only in these few cases.

Conflict of interest None.

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