Chapter

Endoscopic Management of Fistulas and Abscesses in Crohn's Disease

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Abstract

Fistulas and abscesses in Crohn's disease (CD) are mechanical complications of long term disease and can indicate an aggressive disease course. Usually chronic inflammation leads to stricture which leads to high intra-luminal pressure with resultant fistula and abscess upstream to stricture. Exceptions to that may include perianal fistulizing CD which may even precede luminal CD. Hence, management of fistula and abscesses entails management of associated strictures without which these are bound to recur. These mechanical complications (stricture/fistula/abscess) usually occur after initial 4–5 years of disease. Traditionally the management of these complications include surgical therapy. However, surgical therapy can be associated with substantial morbidity specially in these patients on immunosuppressive medications and post-operative recurrence is not uncommon. Interventional radiological procedures to drain intra-abdominal/pelvic abscess can be helpful provided that there are no intervening bowel loops. Hence, there is an unmet need of relatively less invasive endoscopic therapies for treatment of CD related fistulas and abscesses. In this chapter, we shall discuss the role of endoscopic therapy in CD related fistula and abscess.

Keywords: Crohn's disease, fistulotomy, seton, glue, plug, over the scope clips, drainage, endoscopic ultrasound

1. Introduction

Endoscopic treatment of fistula initially includes initial treatment of associated stricture (with endoscopic balloon dilation/stricturotomy or self expanding metal stents-SEMS) and drainage of abscess if any [1]. Chronic fistula are usually the result of transmural disease and fibrosis and hence should usually be treated with opening up of the fistula rather than closure which can be done for acute leaks. The treatment modalities include opening up the fistula by cutting (fistulotomy), filling the fistula with fistula plug/glue injection/stem cell injection or fistula closure with SEMS/endoscopic suturing/clipping [2]. However, the knowledge of underlying pathology and patient

selection are important for such procedures to increase the overall success rate. Usually, short, superficial, simple, bowel to bowel fistulas were ideal for endoscopic therapy. On the contrary, endoscopic therapy for long, deep fistulas close to anal sphincters and anterior rectal walls (due to close proximity to genital structures) are better avoided.

2. Patient selection for endoscopic therapy for fistula in Crohn's disease

Fistulas in Crohn's disease are diagnosed based on clinical, radiologic and endoscopic findings. External fistulas consists of nearly two-third of all CD related fistulas. Among them, the majority are peri-anal fistulas whereas minority are enterocutaneous fistulas. Internal fistulas (nearly one third of all fistulas) consist of enteroenteric and rectovaginal fistulas. As mentioned earlier, patient selection is the key to success for endoscopic therapy for CD related fistulas. The length, depth, complexity, concurrent inflammation and organs involved in the feeding/exiting side of the fistula influence the patient selection. Bowel to bowel fistula are appropriate for endoscopic therapy, whereas extreme caution should be exercised for enterocutaneous fistula. CD related de novo fistula and those from gut to hollow organs (bladder, vagina) should be treated with surgery. Short (<3 cm), shallow (<2 cm deep), benign and non-complex fistulas are ideal for endoscopic therapy (**Figure 1**) [2].

3. Steps of endoscopic management of CD related fistula

The first step of treating CD related fistula is to drain associated abscess or treat associated stricture. All these fistula has a feeding side on the bowel side from which

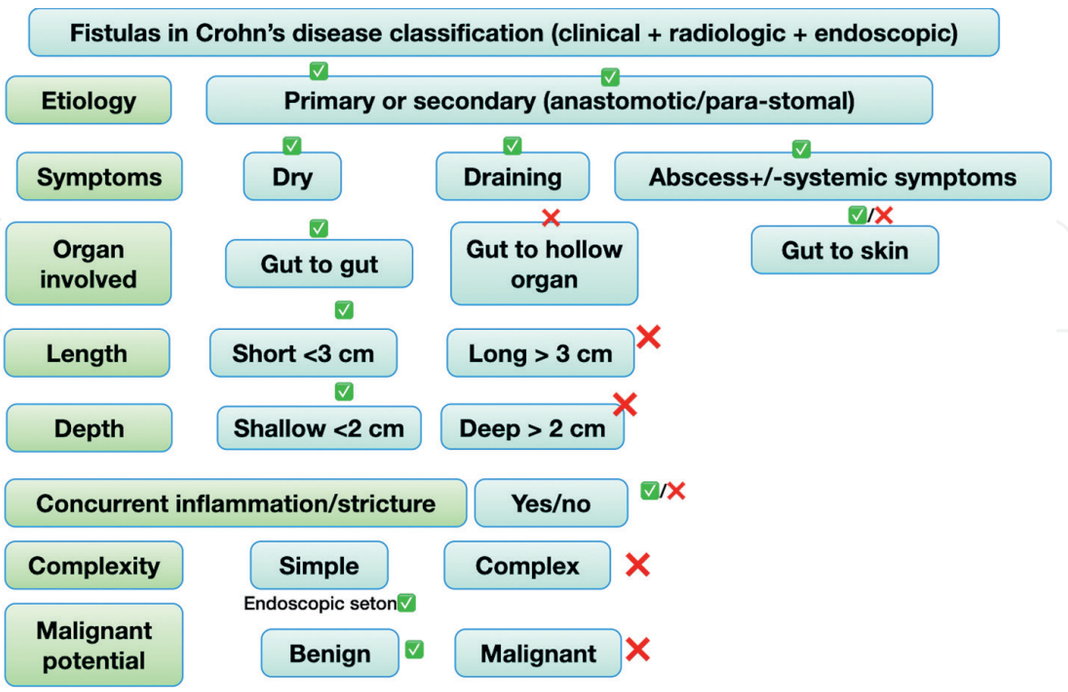

Figure 1.
Patient selection for endoscopic therapy in Crohn's disease based on classification of fistulas. Tick marks (√) indicate feasibility of endoscopic therapy whereas cross marks (X) indicate that endoscopic therapy is not feasible. Both tick and cross mark indicate the need for caution in these settings.

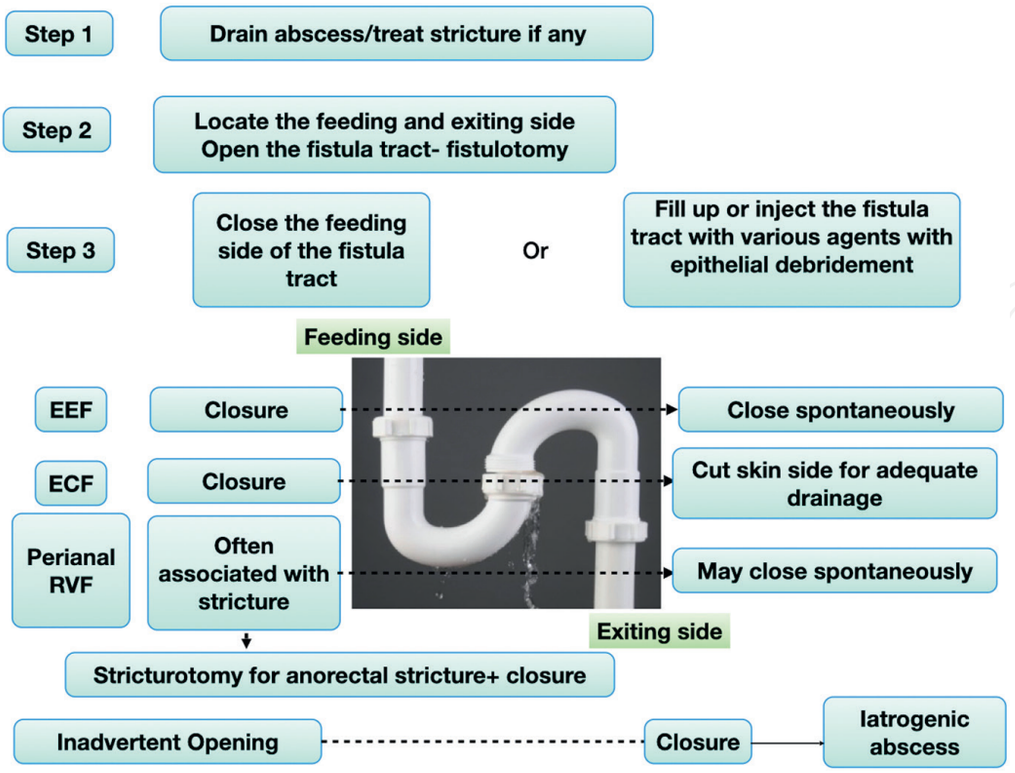

Figure 2.
Steps of endoscopic management of Crohn's disease related fistulas. EEF: Entero-enteric fistula, ECF-enterocutaneous fistula, RVF-rectovaginal fistula.

there is flow of bowel contents to existing site which can be bowel/skin or a hollow organ. In the second step, these sides should be located. Fistulotomy can be done for chronic fistulas. Feeding side can be closed in the third step with filling up of fistula tract with various sclerosing agents/plugs. The exiting side closes spontaneously after closure of feeding side in enter-enteric fistula. Closure of the feeding side of entero-cutaneous fistula needs additional opening up on the exiting side for adequate drainage. Perianal and rectovaginal fistulas are often assisted with stricture which should be treated followed by closure of feeding side. Associated stricture and abscess can be treated endoscopically with endoscopic balloon dilation/endoscopic stricturotomy/stenting and endoscopic incision and drainage by needle knife/seton placement/endoscopic ultrasound (EUS) guided drainage of pelvic abscess (specially if overlying bowel loops hinder radiological drainage). Exiting side usually closes spontaneously in these circumstances. Inadvertent opening of feeding side or closure of exiting side can lead to iatrogenic abscess (**Figure 2**) [2].

4. Endoscopic drainage of abscess

Endoscopic drainage of CD related abscess can be done for perianal abscess or pelvic abscess. Complete drainage for perianal fistula can be done by short, superficial fistula outside external anal sphincter using needle knife (**Figure 3**). Partial drainage can be helpful in long fistulas close to the anal sphincter [2]. Pelvic abscess in close proximity to rectal wall can be drained by endoscopic ultrasound (EUS) guided single time aspiration or pigtail stent drainage. Cases in which interventional radiology is not feasible due to overlying bowel, EUS guided drainage can be particularly helpful (**Figure 4**) [2].

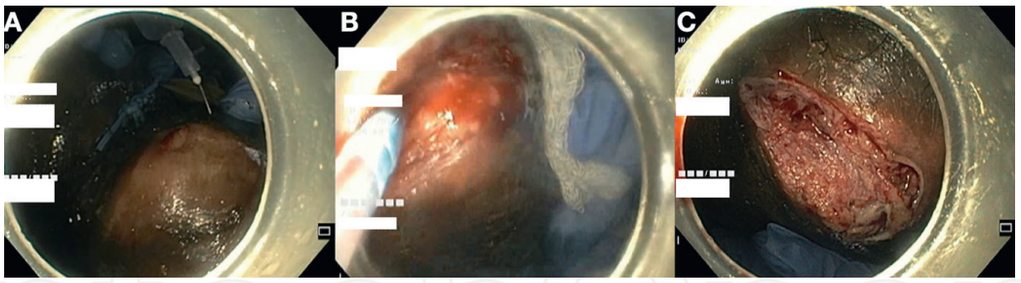

Figure 3.
Endoscopic perianal abscess drainage. A. Recurrent peri-anal abscess post surgical fistulotomy and seton placement, B. Fistulotomy along previous surgical fistulotomy line with needle knife, C. Post endoscopic fistulotomy.

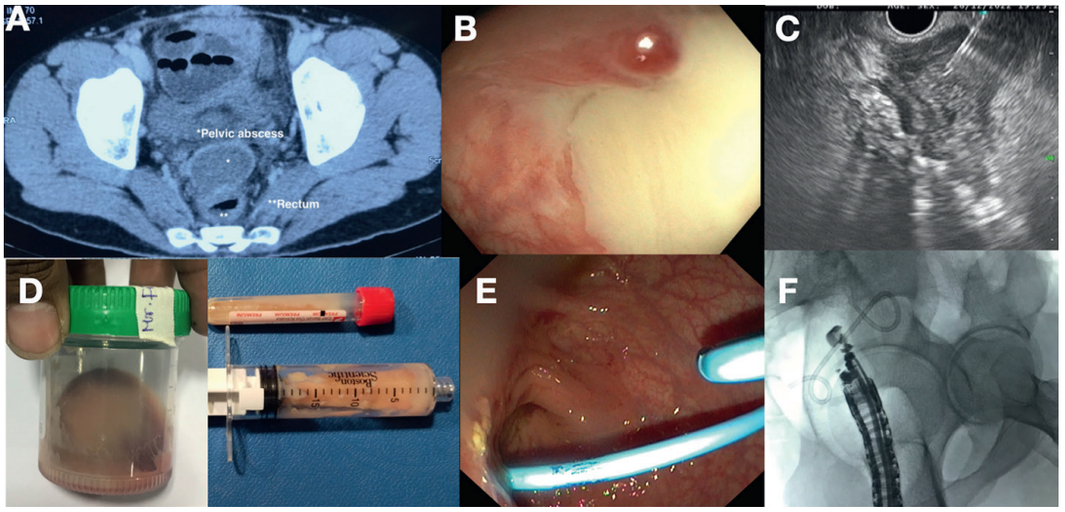

Figure 4.
Endoscopic ultrasound (EUS) guided drainage of pelvic abscess. A. Computed tomography shows pelvic abscess anterior to anterior rectal wall, B. Pus draining from fistulous opening on colonoscopy, C. EUS guided puncture and aspiration of pelvic abscess using 19 G fine needle aspiration needle, D. Aspirated pus, E. Pigtail stent placed under EUS guidance after tract dilation with 6 Fr cystotome, F. Fluoroscopy showing echoendoscope and pigtail stent.

5. Endoscopic seton placement

Endoscopic seton placement can be done for short, superficial perianal fistulas in which internal opening is located close to anal verge and external opening is located nearby in perianal area. The internal opening can be located under endoscopic guidance or by injection of hydrogen peroxide/dye (e.g., indigo carmine/methylene blue) through external opening. Once located, a flexible soft tip guidewire (e.g., Jag wire) can be introduced through the external opening to pass it through the internal opening. This may not be feasible in complex, long, branching fistulas. Once, the guidewire is passed through internal opening, it can be grasped by forceps under endoscopic guidance and a draining seton can be tied over the guidewire. The guidewire is then pulled to place the seton across the fistula following which multiple knots should be applied to prevent early migration of seton (**Figure 5**). Endoscopic seton placement is particularly helpful in CD related simple fistula or re-introduction of seton in case of prior surgical placement of seton.

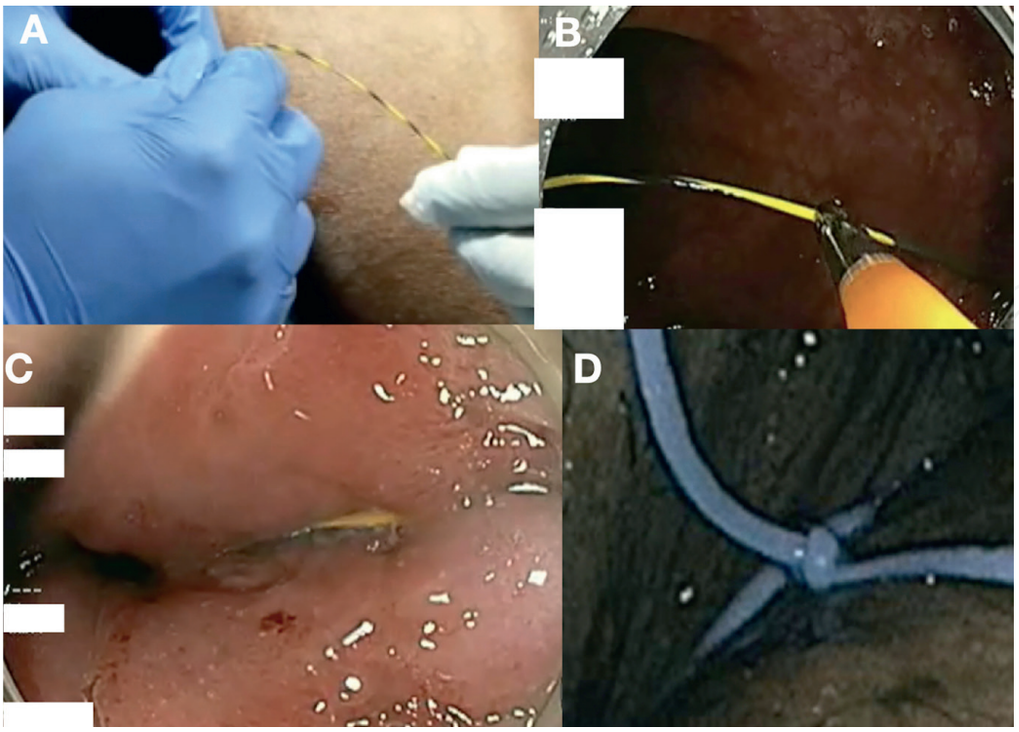

Figure 5.
Endoscopic seton placement. A. Guidewire passed through external fistula opening, B. Guidewire grabbed with forceps once it came out of internal opening, C. Guidewire seen coming out of internal opening located at anal verge. D. Endoscopic seton placed.

6. Endoscopic fistulotomy

Endoscopic fistulotomy in IBD can be done for exiting side of perianal fistula, primary ileo-cecal fistula and postoperative bowel-bowel fistula at suture line or anastomotic site. The largest case series till date (n = 29) have described the feasibility of fistulotomy mainly in pouch related fistulas (n = 21) although fistulotomy has been described for perianal fistula (n-6) and fistula from ileo-colonic anastomotic site to colon [3]. Fistula resolution and clinical success were reported in 89.6 and 75.8%, respectively. Bleeding was described in one case and no cases of perforation was reported [3]. Fistulotomy for enterocutaneous fistula is limited to case reports [4]. After fistulotomy, additional endoclips can prevent re-approximation of the fistula tract. Fistulotomy is an option for short and shallow fistulas.

7. Injection of filling materials

7.1 Glue

After seton removal, glue injection can lead to better (38%) anal fistula healing compared to observation alone (16%) as shown in a randomized controlled trial (RCT) [5]. In a retrospective study of 119 patients, fibrin glue injection led to complete fistula remission in 45.4% at 1 year. Higher fistula healing (63%) was seen in those on combined biologic and immunomodulator therapy [6]. Fibrin glue as an adjunctive therapy with anal advancement flap for repair of complex anal fistula showed no definite benefit over anal advancement flap alone as shown in a RCT [7].

7.2 Anal fistula plug (AFP)

AFP placement can be done under endoscopic guidance although it is usually placed in the operating theater by surgeons. The results of AFP for CD related fistulas are conflicting. In contrast to glue injection, AFP was not useful after seton removal compared to observation alone for anorectal fistula according to a RCT [8]. A prospective study showed high success rates (80% of patients: n = 20; 83% among fistula tracts: n = 36) specially for simple fistula. A long term follow up study with a median follow up 110 months showed a lower overall healing rate (38%). No incremental benefit was seen after placement of three fistula plugs [9].

7.3 Stem cells

Studies evaluating stem cell injection for CD related fistula have done it surgically although such injections can be easily done under endoscopic guidance. In CD related refractory, complex fistula, adipose tissue derived allogenic stem cell injection (120 million cells) have shown to be effective in inducing clinical and radiologic remission at 24 weeks (51 vs. 36% placebo) followed by maintaining remission at 52 weeks (56.3 vs. 38.6% placebo) [10, 11].

7.4 Sclerosing agents

Repeated injections (n = 3) of 50% dextrose and doxycycline have been shown to induce fibrosis and facilitate healing in pouch related fistulas although it can be tried in other CD related fistulas as well [12].

8. Endoscopic closure

8.1 Endoscopic clipping

CD related fistula are results of transmural bowel inflammation and hence endoscopic clipping is not very effective in CD related chronic or primary/de novo fistula closure. However, over the scope clips (OTSC) can be useful for acute post surgical leaks/perforations with single tract and minimal/no inflammation [2]. Through the scope (TTS) clips designed for bleeding control are ineffective for CD related fistulas. Case series have shown 70% technical success rate with OTSC [13]. OTSC should not be used for bowel to hollow organ fistula (rectovaginal) due to suboptimal success and risk of fistula worsening due to thin septum between rectum and vagina. OTSC for closure of intestinal side of enterocutaneous fistula can be done but extreme caution should be exercised and the skin side should be adequately drained [13]. But it should be kept in mind that the results are not very encouraging and there is limited data.

Fistula endoscopic submucosal dissection (ESD) with OTSC closure have been described for non-IBD refractory fistulas. There is no literature on CD related fistula.

8.2 Endoscopic suturing

Endoscopic suturing as a closure method have not been described for IBD fistulas but it can be technically feasible in distal bowel. It should not be attempted in bowel

to hollow organ fistulas (recto-vaginal) and proximal bowel fistulas (technically difficult) [2]. However, suturing can be used for large perforations as a complication of endoscopic therapy or SEMS fixation.

8.3 Endoscopic stenting

The long term efficacy of FCSEMS for CD related fistula is unknown and evidence is limited to case series [14]. Stent fixation is mandatory to prevent migration in the absence of associated stricture.

9. Conclusion

Endoscopic therapy for fistulas and abscesses (**Figure 6**) in CD is challenging due to chronic, transmural nature of disease with high risk of complications due to diseased bowel, poor nutrition and concurrent immunosuppressant use. However, these therapies can delay or prevent surgery, act as an adjunct or help manage post-operative complications. There are paucity of prospective, controlled trials supporting endoscopic therapy for CD related fistula and abscess and are mostly limited to case-series/reports and retrospective studies. Future multi-centre, prospective, comparative studies with can help positioning of these novel approaches in the management algorithm of CD reacted fistulas.

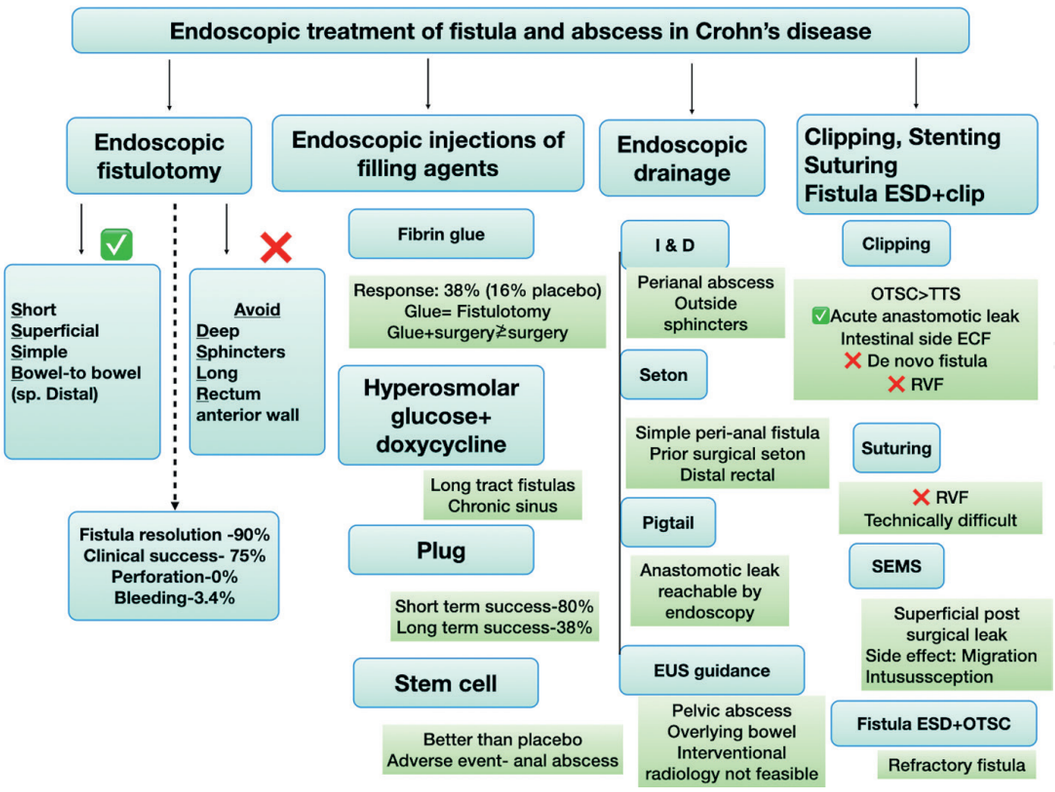

Figure 6.
Summary of endoscopic therapy for Crohn's disease related fistulas. I&D: Incision and drainage, OTSC-over the scope clips, TTS-through the scope clips, RVF-rectovaginal fistula, SEMS-self expanding meta stents, ESD-endoscopic submucosal dissection, ECF-enterocutaneous fistula. (√) indicate feasibility of endoscopic fistulotomy whereas cross marks (X) indicate that endoscopic fistulotomy is not feasible.

Authors' contribution

Conceptualization: PP; Literature review and writing original draft: PP, SK, Illustrations: PP; proof reading and critical review: MT, RG, RP, RB, MR, DNR, approving final manuscript: PP, SK, RB, MR, RP, RG, DNR, MT.

Conflict of interest

None.

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References

[1] Cosnes J, Cattan S, Blain A, Beaugerie L, Carbonnel F, Parc R, et al. Long-term evolution of disease behavior of Crohn's disease. Inflammatory Bowel Diseases. 2002;**8**(4):244-250

[2] Lan N, Shen B. Endoscopic therapy for fistulas and abscesses in Crohn's disease. Gastrointestinal Endoscopy Clinics of North America. 2022;**32**(4):733-746

[3] Kochhar G, Shen B. Endoscopic fistulotomy in inflammatory bowel disease (with video). Gastrointestinal Endoscopy. 2018;**88**(1):87-94

[4] Lee H, Shen B. Endoscopic Fistulotomy heals a Y-shaped enterocutaneous fistula. ACG Case Reports Journal. 2017;**4**:e60

[5] Grimaud JC, Munoz-Bongrand N, Siproudhis L, Abramowitz L, Sénéjoux A, Vitton V, et al. Fibrin glue is effective healing perianal fistulas in patients with Crohn's disease. Gastroenterology. 2010;**138**(7): 2275-2281 81.e1

[6] Vidon M, Munoz-Bongrand N, Lambert J, Maggiori L, Zeitoun JD, Corte H, et al. Long-term efficacy of fibrin glue injection for perianal fistulas in patients with Crohn's disease. Colorectal Disease. 2021;**23**(4):894-900

[7] Ellis CN, Clark S. Fibrin glue as an adjunct to flap repair of anal fistulas: A randomized, controlled study. Diseases of the Colon and Rectum. 2006;**49**(11):1736-1740

[8] Senéjoux A, Siproudhis L, Abramowitz L, Munoz-Bongrand N, Desseaux K, Bouguen G, et al. Fistula plug in fistulising ano-perineal Crohn's disease: A randomised controlled trial. Journal of Crohn's & Colitis. 2016;**10**(2):141-148

[9] Aho Fält U, Zawadzki A, Starck M, Bohe M, Johnson LB. Long-term outcome of the Surgisis(®) (biodesign(®)) anal fistula plug for complex cryptoglandular and Crohn's fistulas. Colorectal Disease. 2021;**23**(1):178-185

[10] Panés J, García-Olmo D, Van Assche G, Colombel JF, Reinisch W, Baumgart DC, et al. Expanded allogeneic adipose-derived mesenchymal stem cells (Cx601) for complex perianal fistulas in Crohn's disease: A phase 3 randomised, double-blind controlled trial. Lancet. 2016;**388**(10051):1281-1290

[11] Panés J, García-Olmo D, Van Assche G, Colombel JF, Reinisch W, Baumgart DC, et al. Long-term efficacy and safety of stem cell therapy (Cx601) for complex perianal fistulas in patients with Crohn's disease. Gastroenterology. 2018;**154**(5):1334-42.e4

[12] Nyabanga CT, Obusez EC, Purysko A, Shen B. Healing of a chronic anal stump sinus after administration of combined high-concentration dextrose and doxycycline solution. International Journal of Colorectal Disease. 2016;**31**(3):775-776

[13] Mennigen R, Laukötter M, Senninger N, Rijcken E. The OTSC(®) proctology clip system for the closure of refractory anal fistulas. Techniques in Coloproctology. 2015;**19**(4):241-246

[14] Cereatti F, Fiocca F, Dumont JL, Ceci V, Vergeau BM, Tuszynski T, et al. Fully covered self-expandable metal stent in the treatment of postsurgical colorectal diseases: Outcome in 29 patients. Therapeutic Advances in Gastroenterology. 2016;**9**(2):180-188