Colovesical Fistula In Morbus Crohn, Diagnostic And Management Challenges: A Case Report

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AUTHORS CONTRIBUTIONS
Each named author has contributed significantly and directly to the project and has given his approval for its publication:
Shkelzen Elezaj, Ass. Prof., Liridon Elezaj, MD was the main bearer of the project from the idea, conception, supervision and design.
Zafer Gashi, Ass. Prof., Fitore Gashi, MD, Gentian Elezaj, MD, Flaka Demaj, MD, Ass.prof, Nexhmi Hyseni, Prof., Muhamet Kadrija, PhD cand., and Fatjona Gashi, PhD cand. Fitim Gashi MSc contributed to literature review, technical editing, language editing, proofreading and some other aspect of the writing process.

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Ethical Statement: Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. The patient's confidentiality has been strictly maintained, and all identifying information has been anonymized. This study complies with ethical standards and guidelines as outlined by the Declaration of Helsinki. Since this is a retrospective case report without experimental intervention, formal ethical approval was not required.

Consent
In accordance with ethical guidelines, informed consent was obtained from the patient described in this article. The patient provided written consent for the use of their personal health information and any identifying details, including photographs and medical data, in this publication. The confidentiality and privacy of the patient have been maintained throughout the article, and their identities have been anonymized where applicable.

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All authors declare no potential conflicts of interest.

ABSTRACT

Introduction: Colovesical fistula secondary to Crohn's disease is a rare complication and very challenging to diagnose. The causes of the formation of enterovesical fistulas are intestinal diseases occurring within the intestinal loop adjacent to the wall of the urinary bladder resulting in pathological communication between the above structures. Mainly diagnosis is made clinically but there are other diagnostic tools that help and can confirm the disease.

Case Presentation: In our case we present 81-year-old men with abdominal pain, pneumaturia and fecaluria. Based on diagnostic tools that we used, we confirmed the fistula between sigmoid part of the colon and bladder and was successfully treated with open laparotomy. The patient on 6-month follow-up is doing well with no signs of recurrence.

Discussion: Colovesical fistula, a pathological communication between bladder and colon is not a common condition [1]. It is a very challenging condition to diagnose and treat. Between conservative and surgery management the latter is preferred option because the probability of fistula to close from conservative treatment is very low, so the definitive treatment remains the surgery.

Conclusion: Enterovesical fistula diagnosis is complex, requiring proper investigation through good anamnesis, cystoscopy, retrograde cystography, CT scan, and colonoscopy are crucial to confirm the diagnosis and surgical successful treatment.

BACKGROUND

This case report highlights a rare but significant complication of Crohn's disease which remains a diagnostic and therapeutic challenge.

By documenting and analyzing this case, we contribute to the growing body of literature on Crohn's related complications, diagnostic strategies, and optimal surgical management, ultimately aiding in improved clinical outcomes.

INTRODUCTION

Colovesical fistula is an uncommon pathological communication between the colon and urinary bladder, occurring within the intestinal loop adjacent to the wall of the bladder resulting in pathological communication between the above structures [1]. Most common cause of enterovesical fistulas are diverticulitis making it for over 75% of cases, malignancy 10-20% and Crohn disease 5-7% [2, 3]. Crohn's disease is a chronic inflammatory disease that is transmural and can lead to perforations. Crohn's disease can affect any part of all gastrointestinal tract or may have also extraintestinal manifestations like skin, eyes, liver or joints [3]. Epidemiology of enterovesical fistula is most commonly seen in North America, Northern Europe, Asia, Australia and New Zealand, and mainly attacks the ages between 15 and 30 and 40 to 60 years [3]. Epidemiological data on enterovesical fistula are contradictory, with incidence rates 3.2%, ranging from 1.6 to 7.7% [2, 3].

The diagnosis of a colovesical fistulas is usually difficult because conventional imaging methods fail to identify a tiny fistulous duct [4, 5]. Many scientific works have given the priority of computed tomography scanning due to its high sensitivity in identifying a fistulous channel and defining its relationships to surrounding structures [6,7], but in our case radiologists hesitate to perform the computed tomography due to the high values of BUN and creatinine in serum, so in the diagnosis of a colovesical fistula we have based on the presenting symptoms, cystoscopy, cystography and colonoscopy. Treatment of enterovesical fistula can be conservative and surgical, but the optimal treatment of enterovesical fistulas is still debatable and sometimes controversial [5-7]. The results varied across studies, but the surgical indication include the presence of complication such as bowel obstruction, abscess formation and longer duration of the fistula [4 - 9]. Many aspects of enterovesical fistulas management have changed over this time period, including efficient and quality of diagnostic imaging and advancing surgical skills and techniques [9-11]. In this report we present one case of colovesical fistula due to Crohn's disease, which was successfully treated with surgery and diagnostic tools we used.

CASE PRESENTATION

An 81-year-old male was admitted to the urologic department. The patient was complaining of abdominal pain, fatigue, diarrhea, oliguria, pneumaturia and dark blurry urine.

Ultrasonography: Kidneys are smaller and irregular in outline owing and focal parenchymal loss, renal cortex in both kidneys are more echogenic than the liver parenchyma. The pyramids are difficult to outline sonographycally. The left kidney has a small cystic formation (Figure 1).

After ultrasonography we insert urinary catheter, in which we can see fecal content inside urinary drainage bag. Afterwards we drain the urinary bag inside a bucket (Figure 2) where we can see the dirty urine.

Laboratory blood tests results were as follows: ESR 100; HGB 98; HCT 28; WBC 12.000/mm3 with 80% neutrophils; Urea 13.7 mmol/L; Creatinine 177 umol/L; CRP 147. Urine culture yielded E. coli and Clostridium difficile. We start the patient on antibiotics but without resolution of symptoms. Due to the frequent blockade of the urinary catheter with fecal masses we perform a cystoscopy but due to the fecal content, the lumen of the urinary bladder cannot be explored, so first we perform flushing of the content with physiological solution (Figure 3).

Before the cystoscopy we rinse the bladder with 150 mL. NaCl 0.9 % which we see the debris inside the syringe (Figures 3A,3B).

During the examination with a cystoscope, we see a defect of the bladder mucosa in the left lateral wall with a diameter of around 10 mm which can be passed with a ureteral catheter, and we doubt there is a communication between bladder and the intestine (Figure 4).

Also, on cystography we can see the leakage of contrast into the colon, which confirms the presence of fistula (Figure 5).

Due to high levels of creatinine, we did computed tomography (CT) without contrast simultaneously with cystography which also revealed contrast leakage from the bladder.

The patient also was sent to gastroenterology department and colonoscopy was performed. A colonoscopy showed a papillary elevation of the rectal mucosa with a crater in the center, where a biopsy is performed. The examination of the sigma showed friable, papillary and ulcerated lesions, from which four samples are taken. Biopsy reports did not show any specific findings. The rest of the colon is completely occluded and is impassable beyond this point (Figures 7A,7B).

Based on the investigations done, we conclude that the patient has colovesical fistula. Due to deteriorating general condition of the patient, high BUN and creatinine in the serum, anemia and the persistence of urinary tract infections. Open surgery is performed. During surgery the sigmoid part of the colon is firm to palpation and is adhered to the bladder. Then we separate the colon from the bladder, localize the fistula (Figures 8A,8B) and we have closed the defect in the bladder in two layers with absorbable sutures. After sutured closure of fistula, we performed the leak test to confirm that there is

no fluid leakage. The adhered part of the colon was necrotized which we had to resect it and send it for histopathological examination. Beside the fistula there was also another hole in rectum which we closed with suture. Between the bladder and rectum, we interposition the omentum to nourish and protect the surrounding structures.

Due to advanced age, malnutrition and poor condition of the patient, we could not do anastomoses of the bowels which ended in colostomy. We place the surgical drainage system and urinary catheter.

The resected part of the colon is showed in figures 9A, 9B, where we also can see the ulceronecrotic and stenotic part of the colon.

In figure 10A, 10B, we can see the histopathological results in which the pathologist described as follows:

Macroscopic examination: the segment of sigmoid colon with adhesive tissue around, with narrow lumen and thick mucosal walls. Urinary bladder with thick walls, firm and fibrotic.

Microscopic examination: mucosa is observed in the examined samples of the edematous colon with dense inflammatory infiltrates composed of lymphocytes, plasmocytes, histiocytes and eosinophils, in some places accompanied by mucosal and submucosal fissures. In the entire thickness of the fragments, inflammatory infiltrates, giant multinuclear gels and foci of linear ulcerations are observed. The inflammation is transmural, which also includes the urinary tract.

On day 3 we remove the surgical drainage system whereas on day 10 we removed the urinary catheter. The next day we discharged the patient in good local and general condition. To prevent the recurrence of enterovesical fistula we apply a reduced dose of anti-TNF and immunosuppressant therapy. At 6-month follow-up the patient is feeling well, laboratory results are greatly improved and there is no evidence of signs and symptoms of fistula.

DISCUSSION

Colovesical fistula, a pathological communication between bladder and colon is not a common condition [1]. It is a very challenging condition to diagnose and treat. From all types of enterovesical fistulas due to CD, the most common site is ileum whereas the most common diagnostic tools are cystoscopy, CT scan and MRI [4-10,18]. Due to poor rate of investigations to confirm the fistula most of the time diagnosis is clinically. The most confirmatory symptoms for enterovesical fistula are pneumaturia and fecaluria [4-9]. Cystoscopy remains very important tool and has been regarded as a first-line diagnosis test, although identifying the fistula yielded nonspecific findings, failing to identify colovesical fistula in 50% to 60% of cases. However, they could see other important findings like: erythema, bullous edema, ulcer or stones in 80-100 % [7,18]. From all the diagnostic tools, CT has become the test of choice with an accuracy up to 90% in diagnosing enterovesical fistula [5-10,18]. Between conservative and surgery management the latter is preferred option because the probability of fistula to close from conservative treatment is very low, so the definitive treatment remains the surgery [7, -10,19,20].

Conservative treatment consists of antibiotics, 5-ASA agents such as mesalazine, anti-TNF and corticosteroids [7,8,10,11,14]. Indications of conservative therapy are for patients unfit for surgery, contraindication of general anesthesia, terminal disease and maintenance therapy after surgery [9,10]. In general, the failures of medical treatment especially in cases with pronounced fistulas, free perforation, intestinal stenosis, persistent and progression of lower urinary tract symptoms such as severe sepsis, recurrent urinary infections, frequent urination, deteriorating renal functions, no response to medical treatment and side effects of medicament therapy like aplastic anemia give us a suggestion of advantages of surgical option in treatment of enterovesical fistula [7,9,11-13,16,17,19].

Open laparotomy is a better choice compared to laparoscopy for approaching enterovesical fistula especially in complicated cases and the high conversion rate up to 36% [13,16,17]. Open laparotomy requires a well-trained surgical team and, in most cases, there is a need for a multidisciplinary approach [13,16,17]. Surgical intervention which includes bowel resection and closure defect of the bladder has more than 90% remission. Primary resection and anastomosis of the intestine is the most used procedure, while the enteric diversion is recommended in high-risk patients [13,14,16,17].

Taken together, surgery seems to provide a better solution compared to medical treatment [4-7,12-14,16,17]. In our patient we used the most common diagnostic tools (cystoscopy, colonoscopy, CT and cystography), and all of them confirmed the presence of fistula, and open laparotomy was the approach we have used for the treatment of enterovesical fistula, which is consistent with other studies [7,12,13,15,16,19,20]. The long-term remission rate of enterovesical fistulas appears to be higher with an operative approach than a medical therapy approach [4,6,7,17,19]. In addition, many advanced mini-invasive methods have been used in the treatment of enterovesical fistulas such us endoscopic fistulotomy, laser closure of the fistula, local injection of anti-TNF injection, or stem cell transplantation which have shown limited results because there is a lack of a larger studies and longer follow-up [17,19,20].

CONCLUSIONS

In summary, enterovesical fistula diagnosis is complex, requiring proper investigation through good anamnesis, cystoscopy, retrograde cystography, CT scan, and colonoscopy which are crucial to confirm the diagnosis. Many aspects of enterovesical fistulas management have changed over this time period, thanks to novels efficient and quality of diagnostic imaging and advancing surgical skills and techniques. Based on the publications of the other authors, the definitive treatment

of enterovesical fistulas is heterogenous across the included studies, and the optimal surgical treatment for fistulizing Crohn's disease can differ among individuals, with no consensus regarding the best surgical approach. However, the type of surgical procedure should be adapted to the experience of the surgeon, the anatomical location and complexity of the fistulas. In general, it seems that the surgical intervention is accompanied by a low recurrence rate and lower cost-effectiveness, while nonoperative management has been advocated for patients unfit for surgery due to poor condition, with mild symptoms or those who decline surgical intervention.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of Colovesical Fistula is Diverticulitis, Bladder Cancer, Colorectal Cancer. But these conditions won't have the presence of pneumaturia and fecaluria which are the most confirmatory symptoms of fistula.

TEACHING POINT

The key teaching point is that colovesical fistula secondary to Crohn's disease is a rare but serious complication that requires a high index of suspicion for diagnosis. While clinical symptoms such as pneumaturia and fecaluria are suggestive, imaging studies (CT scan, cystoscopy, retrograde cystography, and colonoscopy) are crucial for confirmation. Given the low likelihood of spontaneous closure in difficult cases, surgical intervention remains the definitive treatment, leading to good patient outcomes, as demonstrated in this case.

QUESTIONS

1. What are the most common causes of colovesical fistulas?

Explanation: The most common causes include diverticulitis (50-70%), malignancies (colon or bladder cancer), Crohn's disease (10% of cases), radiation therapy, and surgical or traumatic injury.

2. What is the hallmark clinical symptoms of a colovesical fistula?

Explanation: The key symptoms include pneumaturia (passage of gas in urine), fecaluria (presence of fecal material in urine), recurrent urinary tract infections (UTIs), and abdominal pain.

3. How does Crohn's disease contribute to the formation of a colovesical fistula?

Explanation: Chronic inflammation in Crohn's disease leads to deep ulcers and transmural inflammation, which can erode through adjacent structures, including the bladder, forming a pathological connection.

4. What imaging and diagnostic modalities are most effective in confirming a colovesical fistula?

Explanation: CT scan (with oral/rectal contrast) is the most sensitive tool, showing air or contrast in the bladder.

Cystoscopy can visualize the fistula opening in the bladder.

Colonoscopy helps assess underlying colonic pathology.

Retrograde cystography may reveal contrast leakage from the bladder into the colon.

5. What are the main differential diagnoses for a patient presenting with pneumaturia and fecaluria?

Explanation: Diverticulitis, colorectal cancer, radiation-induced fistula, bladder cancer, trauma, and surgical complications.

ETHICAL STATEMENT

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. The patient's confidentiality has been strictly maintained, and all identifying information has been anonymized. This study complies with ethical standards and guidelines as outlined by the Declaration of Helsinki. Since this is a retrospective case report without experimental intervention, formal ethical approval was not required.

REFERENCES

1. Pasternak G, Aebisher DB, Aebisher D, Filip RS. Crohn's disease complicated with a bladder-fistula – a case report. European Journal of Clinical and Experimantal Medicine. 2021; 19(1): 76-80.
2. Seeras K, Qasawa RN, Akbar H, Lopez PP. Colovesical Fistula, StatPearls Publishing, 2024.
3. Ranasinghe IR, Tian C, Hsu R. Crohn Disease*, StatPearls Publishing*, 2024.
4. Hattori N, Nakayama G, Umeda S, et al. Outcomes of surgical treatment for enterovesical fistula in Crohn's disease. *Nagoya J Med Sci.* 2024; 86(2): 280-291. PMID: 38962416.
5. Biehl LK, Yo KR, Harrison LS, Timmerman W, Rivers J, Miller T. Colovesical Fistula: A 28 year experience at a major United States Department of Veterans Affairs Medical Center. *Surg Pract Sci.* 2022; 11:100100. PMID: 39845169.
6. Taxonera C, Barreiro-de-Acosta M, Bastida G, et al. Outcomes of Medical and Surgical Therapy for Entero-urinary Fistulas in Crohn's Disease. *J Crohns Colitis*. 2016; 10(6): 657-662. PMID: 26786982.
7. Hsu MW, Chen WC, Wei TN, Huang CP. Management of Enterovesical Fistula in a Patient with Crohn's Disease: A Case Report and Literature Review. *Diagnostics (Basel).* 2023; 13(9): 1527. PMID: 37174919.
8. Lamb CA, Kennedy NA, Raine T, et al. British Society of Gastroenterology consensus guidelines on the management of inflammatory bowel disease in adults. *Gut.* 2019; 68(Suppl 3): s1-s106. PMID: 31562236.
9. Shaydakov ME, Pastorino A, Tuma F. Enterovesical Fistula, StatPearls, 2024.
10. Barnes EL, Lightner AL, Regueiro M. Perioperative and Postoperative Management of Patients With Crohn's Disease and Ulcerative Colitis. *Clin Gastroenterol Hepatol.* 2020; 18(6): 1356-1366. PMID: 31589972.

11. Olson S, Welton L, Jahansouz C. Perioperative Considerations for the Surgical Treatment of Crohn's Disease with Discussion on Surgical Antibiotics Practices and Impact on the Gut Microbiome. *Antibiotics (Basel).* 2024; 13(4): 317. PMID: 38666993.
12. Keady C, Hechtl D, Joyce M. When the bowel meets the bladder: Optimal management of colorectal pathology with urological involvement *World J Gastrointest Surg.* 2020; 12(5): 208-225. PMID: 32551027.
13. Trejo-Avila M, Vergara-Fernández O. Open versus laparoscopic surgery for the treatment of diverticular colovesical fistulas: a systematic review and meta-analysis. *ANZ J Surg.* 2021; 91(9): E570-E577. PMID: 34056819.
14. Stefanou CK, Gkogkos S, Flindris S, et al. Colovesical Fistula due to Sigmoid Diverticulitis. *Case Reports in Surgery*. 2023; (1).
15. Oner M, Abbas MA.Current Management of Colovesical Fistula. *Turk J Colorectal Dis.* 2022; 32(4): 229-237.
16. Zizzo M, Tumiati D, Bassi MC, et al. A. Management of colovesical fistula: a systematic review. *Minerva Urol Nephrol.* 2022; 74(4): 400-408. PMID: 34791866.
17. Granieri S, Sessa F, Bonomi A, et al. Indications and outcomes of enterovesical and colovesical fistulas: systematic review of the literature and meta-analysis of prevalence. *BMC Surg.* 2021; 27(1): 265. PMID: 34044862.
18. Xu R, Vaughan A, Fagan M, Schumacher DP, Wekullo V, Gehrke B. Colovesical fistula in men with chronic urinary tract infection: A diagnostic challenge. *Cleve Clin J Med*. 2023; 90(3): 165-171. PMID: 36858611.
19. Wetwittayakhlang P, Al Khoury A, Hahn GD, Lakatos PL. The Optimal Management of Fistulizing Crohn's Disease: Evidence beyond Randomized Clinical Trials. *J Clin Med.* 2022; 11(11): 3045. PMID: 35683433.
20. Abramowitz L. Brochard C. Pigot F, et al. Surgical Closure, Mainly with Glue Injection and Anti-tumour Necrosis Factor α, in Fistulizing Perianal Crohn's Disease: A Multicentre Randomized Controlled Trial. *Colorectal Dis.* 2022; 24(2): 210–219. PMID: 34623746.

FIGURES

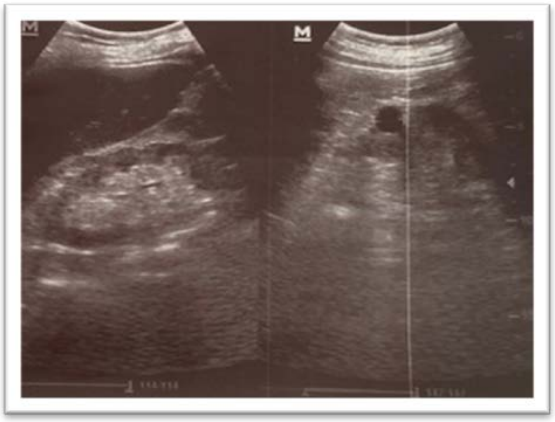

Figure 1: Ultrasonography of the kidneys

Figure 2: Fecal matter in urine.

A B

Figure 3A: Inserting clear physiological solution during cystoscopy.
Figure 3B: Debris in syringe after rinsing with the physiological solution.

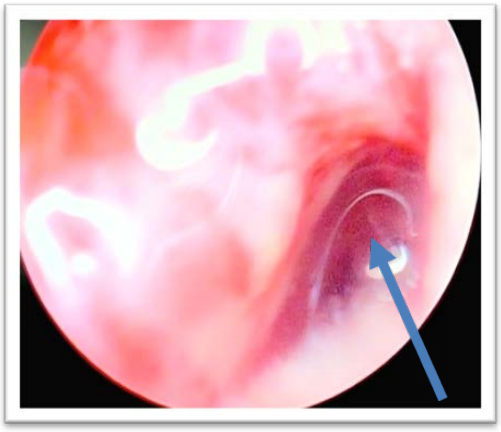

Figure 4: Blue arrow indicates bladder fistula.

Figure 5: Cystography showed leakage of barium after contrast filling.

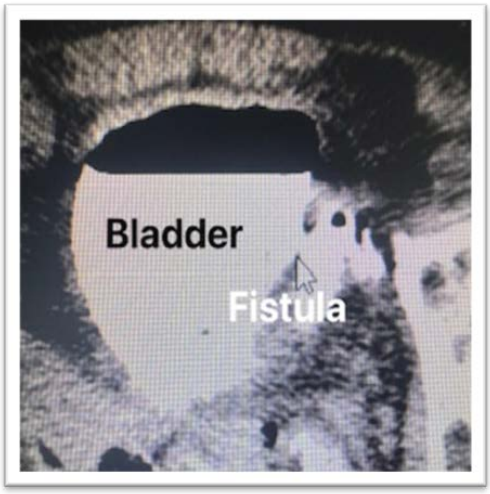

Figure 6: CT cystography shows the passage of barium from the bladder through the fistulous canal into the colon

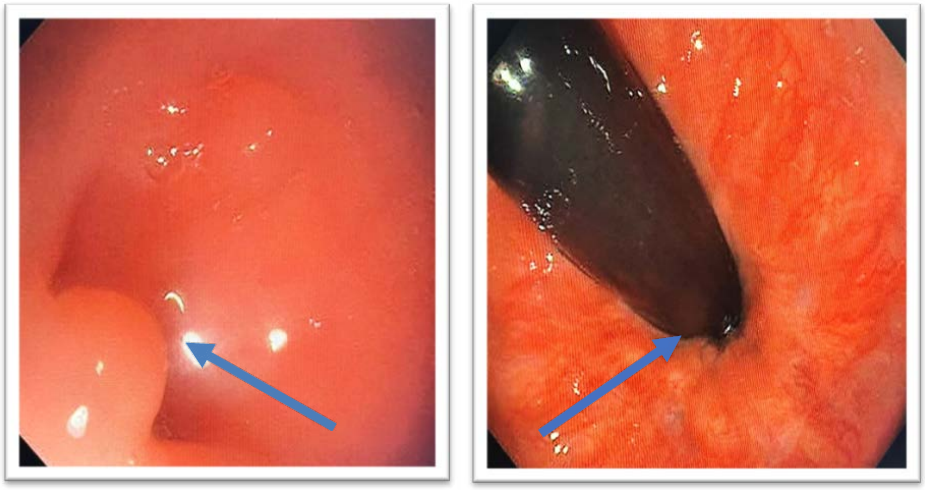

Figure 7A: Colonoscopy revealing fistula
Figure 7B: completely occluded part of the rectosigmoideal junction

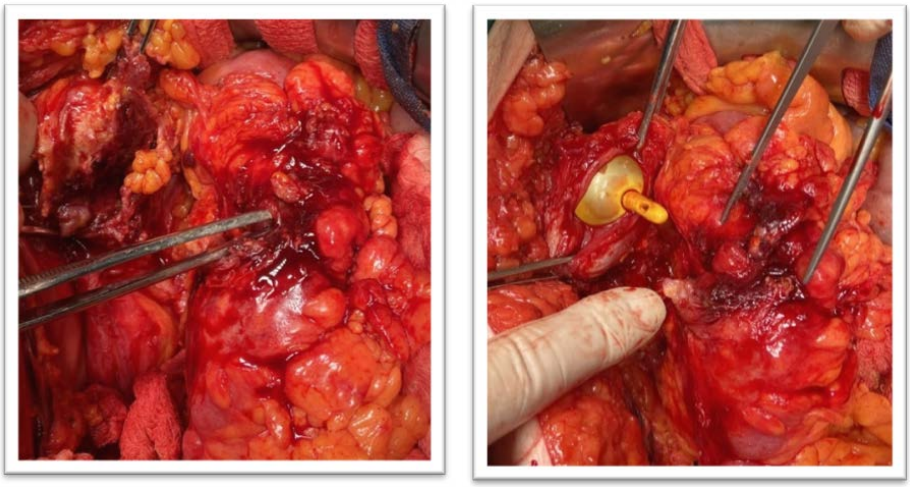

Figure 8A: Forceps indicate a fistula, **Figure 8B:** Intraoperatively appearance of the defect in the bladder

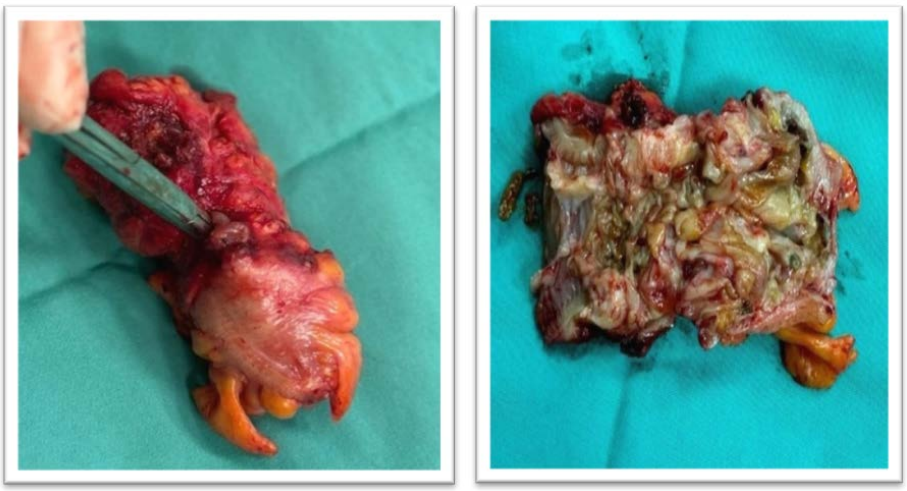

Figure 9A: Resected part from the colon sigmoideum. **Figure 9B:** View of the lumen of the resected colon after dissection from the bladder

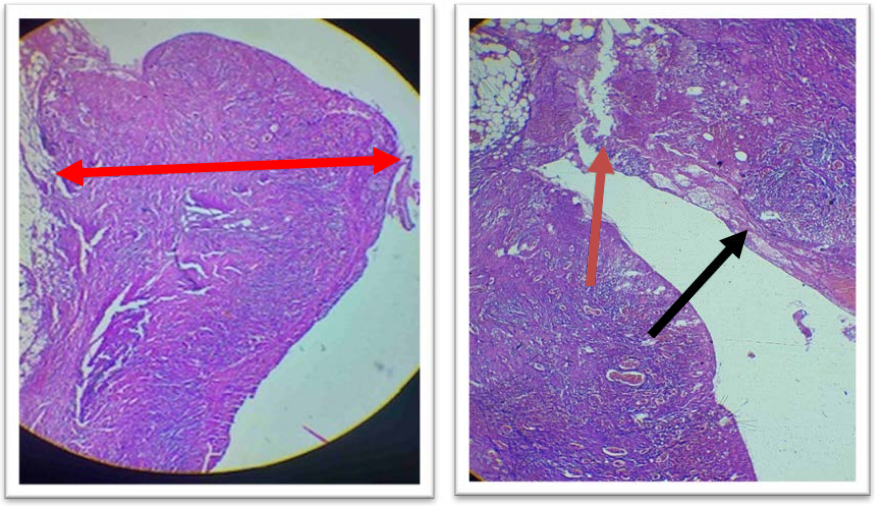

Figure 10 A: Red arrow indicates transmural inflammation. **Figure 10B:** Orange arrrow indicates mucosal and submucosal fissures. Black arrow represent the granuloma.

KEYWORDS

Colovesical fistula, Crohn's disease, cystoscopy, colonoscopy, CT, enterectomy

ABBREVIATIONS

CT = COMPUTED TOMOGRAPHY
BUN = BLOOD UREA NITROGEN
MRI = MAGNETIC RESONANCE IMAGING
ESR = ERYTHROCYTE SEDIMENTATION RATE
HGB = HEMOGLOBIN
HCT = HEMATOCRIT
WBC= WHITE BLOOD CELLS

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