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Surgery for Crohn's Disease Affects Male Sexual Function

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Abstract

Background: Crohn's disease (CD) has significant effects on quality of life. There is a paucity of information regarding how surgery for CD affects male sexual function.
Objectives: To determine the effects of surgery for CD on male sexual function.
Methods: A survey was sent to male patients who had surgery for CD at a tertiary care institution between January 1st, 2011 and July 1st, 2016. The survey included the Patient Health Questionnaire (PHQ-9), short inflammatory bowel disease questionnaire (SIBDQ), and the international index of erectile function (IIEF-5). A retrospective chart review was performed. Statistical analysis was performed using Fischer's exact test and two-sided *t*-test.
Results: The survey was sent to 149 men and twenty-one patients (14%) responded. The mean age of respondents was 54.9 years. On analysis of patients who completed the IIEF-5, 12 patients (63%) met criteria for erectile dysfunction (ED). Ten patients subjectively reported worsened sexual function following surgery (48%). Men who had previously undergone surgery for CD were more likely to have ED (P = 0.01). Patients who met criteria for depression were more likely to have ED (P = 0.006). Men with more CD symptoms were more likely to have ED: the mean SIBDQ score for men with ED was 4.5, while the mean score for men without ED was 5.8 (P = 0.01).
Conclusions: Men who undergo surgery for CD experience high rates of sexual dysfunction, with many men reporting their sexual functioned worsened following surgery. More research needs to be done to further characterize sexual dysfunction in men with CD.

Keywords: Crohn's Disease, Surgery, Outcomes

1. Background

Crohn's disease (CD) is a chronic disease that can affect the entire gastrointestinal tract and often has significant effects on patients' quality of life (1). The onset of CD is typically between the ages of 15 and 40 years, coinciding with peak reproductive years (2). The inflammatory nature of CD, coupled with the variability of organ distribution, gives rise to a spectrum of clinical phenotypes that require varying medical and surgical treatment (1, 3). Specific indications for surgery include abdominal disease that is refractory to medical therapy such as fibrostenotic strictures with symptoms of bowel obstruction, intestinal perforation, and internal fistulas. Perianal disease, including abscesses and fistulas, may also be treated surgically. Surgery may also be required for high grade dysplasia and cancers that result from longstanding CD (3-5). It is estimated that between 25% and 60% of CD patients will undergo abdominal surgery within five years of diagnosis (6).

Sexual function is a major contributor to quality of life in inflammatory bowel disease (IBD) patients and the impact of disease on sexual function and intimacy is a substantial concern for many patients (7, 8). Despite the large number of people who have surgery for CD every year, there is limited data evaluating how this affects long-term sexual function in men. There are several studies describing the negative association between IBD and sexual function in women, but the evidence for worsened sexual function in men with IBD is less conclusive (9-12).

2. Objectives

The purpose of this study is to evaluate the sexual function in men who underwent surgical treatment for CD and to determine clinical and surgical factors associated with negative impact on sexual function. By analyzing the outcomes of these patients, we aim to identify modifiable risk factors for patients undergoing surgery for CD and clarify outcomes to better counsel patients regarding expectations prior to undergoing surgery.

3. Methods

Eligible patients for this study include male patients diagnosed with CD who underwent surgery at University Hospitals Cleveland Medical Center (UHCMC) in Cleveland, Ohio between January 1st, 2011 and July 1st, 2016. Patients diagnosed with CD who had surgery for indications unrelated to CD and patients who did not have complete or correct addresses in their medical record were excluded from the study. All participants were 18 years or older at the time of the study.

Following Institutional Review Board approval from UHCMC, eligible patients were identified and a prospective survey was mailed to all patients. Consent was implied by completion of the survey. The survey consisted of the questions "Have you been sexually active in the past six months?" and "Do you believe your sexual function changed following your surgery for Crohn's disease?" as well as the patient health questionnaire (PHQ-9), short inflammatory bowel disease questionnaire (SIBDQ), and the simplified international index of erectile function (IIEF-5).

The PHQ-9 is a well-validated questionnaire used in both research and clinical settings to evaluate patients' risk of depression. To determine clinically significant depression, the recommended cutoff score of 10 was used, which has a sensitivity of 88% and a specificity of 88% for major depression (13). The SIBDQ is a validated ten item questionnaire that measures quality of life in the domains of IBD symptoms, emotional health, systemic symptoms, and social function. The questions are scored from one to seven, with a higher score indicating a better quality of life (14). The IIEF-5 is a widely-used five item questionnaire and is considered the gold-standard for assessing male sexual function, with a cutoff score of 21 determining erectile dysfunction (ED) (15).

A retrospective chart review was performed on all subjects who responded to the survey to collect the following data points: Demographics, comorbidities, disease distribution, indication for surgery, date of operation, operation performed, and previous operations for CD. Patient comorbidities collected include diabetes, hypertension, cardiovascular disease, and smoking which includes current smokers and former smokers with a fifteen or greater pack year history. Indications for surgery were separated as stricture/obstruction, medically refractory disease, perianal complaints, and penetrating abdominal disease. Perianal complaints included perianal abscesses and fistulas. Surgical indications characterized as penetrating abdominal disease included intestinal perforation and internal or enterocutaneous fistulas. Patients were separated into groups based on ED status, as determined by IIEF-5, for comparison. Categorical data was compared using Fischer's exact test and continuous variables were evaluated using Student's two-sided *t*-test. Stata SE, version 13.0 (StataCorp, College Station, TX) was used to perform all statistical analysis. A P value < 0.05 was used to determine statistical significance.

4. Results

There were 149 men who underwent surgery for CD who met inclusion criteria. Of those, 21 men (14%) returned surveys and were included in our study. The mean age of study participants was 55 years (s = 16 years). The minimum time from surgery at which patients were sent surveys was 21 months, with a mean time from surgery of 47 months (s = 19 months). The most common indication for surgery was stricture/obstruction (33%) and the most common surgery performed was ileocolic resection (38%). Eleven men (52%) had previously undergone surgery for CD. Three patients received a temporary stoma during surgery, while a permanent stoma was created in two patients. The most common comorbidity was smoking (43%), followed by hypertension (29%).

According to completed surveys, all patients reported being sexually active in the past six months. When asked how they believe their sexual function changed after surgery, ten patients (48%) reported no change, one patient reported improvement (4.8%), and ten patients reported worsened sexual function (48%). On analysis of PHQ-9, eight men (38%) met criteria for depression. Of the 21 respondents, nineteen men completed the IIEF-5 questions. Twelve IIEF-5 respondents (63%) were determined to have ED.

On comparison of men with and without ED (Table 1), men with ED tended to be over 50 years of age and more remote from surgery, but neither met statistical significance. No single indication for surgery nor surgical procedure was significantly associated with ED. However, men who had previously received surgery for CD were more likely to have ED (P = 0.01). Upon answering how their sexual function changed after surgery, all ten men who reported worsened sexual function met criteria for ED (P = 0.001). Men with more comorbidities trended towards having ED, but only men with hypertension were statistically more likely to have ED (P = 0.03). Patients who met criteria for depression according to PHQ-9 were more likely to have ED (P = 0.01). Men with more symptomatic IBD, as determined by SIBDQ score at time of survey, were more likely to have ED as well: the mean SIBDQ score for men with ED was 4.5 ± 1, while the mean score for men without ED was 5.8 ± 0.7 (P = 0.01).

Table 1. Characteristics of Men with Erectile Dysfunction

Variables	Erectile Dysfunction	No Erectile Dysfunction	P Value
Total	12	7	
Age, y			
< 50	3	3	0.136
≥ 50	9	4	
Time from surgery, mo			0.269
Mean	51.2 (21 - 76)	40.7 (23 - 65)	
Disease distribution			1
Perianal disease	4	2	
Comorbidities			
Hypertension	6	0	0.034
Cardiovascular disease	3	0	0.263
Smoking	7	2	0.350
Indication for surgery			0.418
Penetrating abdominal disease	2	1	
Obstruction/stricture	4	3	
Medically refractory	4	0	
Perianal complaints	2	3	
Surgery			0.631
Small bowel resection	3	0	
Ileocolic resection	3	3	
Colon resection (segmental)	1	1	
Total abdominal colectomy	1	0	
Proctocolectomy	1	1	
Fistulotomy	3	2	
Stoma creation			0.509
Yes	2	1	
No	10	7	
Multiple surgeries			0.010
Yes	11	2	
No	1	5	
Sexual function after surgery			0.001
Improved	0	1	
Worsened	10	0	
No change	2	6	
SIBDQ			0.012
Mean	4.5	5.8	
Range	3.0 - 6.1	4.7 - 7.0	
PHQ-9			0.013
No depression	4	7	
Depression	8	0	

Abbreviations: SIBDQ, short inflammatory bowel disease questionnaire; PHQ-9, patient health questionnaire.

5. Discussion

This study demonstrates that sexual dysfunction is highly prevalent in men with CD: 63% of survey respondents reported some degree of ED. Of these men determined to have ED, 83% of them reported their sexual function worsened following their surgery. Patients who had undergone multiple surgeries for CD were more likely to have ED compared to those patients who have only had one surgery. We also found that patients with depression (as determined by PHQ) and worse symptom-related quality of life at the time of the survey (as determined by SIBDQ) were more likely to have ED.

The results of this study provide an important contribution to the limited research evaluating the impact of surgery on CD patients' sexual function. Prior studies on the effects surgery has on IBD patients' sexual function primarily focuses on ulcerative colitis (UC) rather than CD. Multiple studies have assessed sexual function

following ileal pouch anal anastomosis, but the number of CD patients included and the rates of sexual dysfunction vary widely (16-18). One study evaluating outcomes after surgery for anal fistulas found CD patients reported worse overall quality of life, but did not have any overall effect on sexual function (19). Similarly, we did not find that perianal disease distribution or perianal indications for surgery were any more associated with ED than other disease distributions. Several studies have reported the negative impact of stomas on patients' sexuality and sexual function (20-22). Our study failed to identify the creation of a stoma as a statistically significant factor associated with ED, likely due to the low number of patients in our cohort who received a stoma following surgery.

Our findings of depression being a determinant of sexual dysfunction aligns with previous studies that show psychological stressors play a large role in sexual dysfunction in IBD patients (9, 11, 23, 24). While we determined disease activity is associated with ED in men, previous studies provide inconsistent results on whether disease activity is associated with sexual dysfunction (9, 25). The average age of our patient cohort was 55 years, which coincides with the known average age of onset of erectile dysfunction in all men of 56 years (15). The prevalence of ED we found in men who underwent surgery for CD far exceeds the prevalence of sexual dysfunction in men in the general population of 6% - 10% (26-28), and was even higher than previously reported rates of ED in men with IBD, which range from 15% to 25% (11, 23, 24). Although prevalence of sexual dysfunction in patients with IBD is higher than general public, studies have provided little evidence that sexual dysfunction is a persistent issue for men with IBD outside of the indirect impact of psychological maladaptation and times of increased disease severity (9). Our study suggests that surgery, independent of previously described associations with disease activity and depression, is indicative of sexual dysfunction in men.

Our major finding, that men who undergo surgery for CD report worsening sexual function following surgery, is somewhat counterintuitive. It might be expected that while their disease is active and they are medically ill, their sexual function would diminish and once they are treated and their health improves, sexual function would improve. Our study contradicts this expectation.

This study has several limitations. The most significant limitation is our small sample size. We are unable to determine if specific presentations of CD or specific surgeries are associated with sexual dysfunction due to the small number of respondents. Due to the nature of our study, there is potential for bias in who completed and returned the questionnaires. These limitations make generalizability beyond our cohort difficult. Despite these limitations, our study provides further knowledge describing how CD may affect the quality of life of those living with the disease. Personal satisfaction with sexuality and sexual function has a major impact on quality of life, and we found that men who undergo surgery for CD are likely to have sexual dysfunction. The issue of sexual well-being and function should be discussed with CD patients prior to surgery, particularly those who have undergone prior surgeries. More work should be performed to increase the understanding of how surgery for CD affects sexual function in men and ultimately to determine optimal treatment.

In conclusion, men who undergo surgery for CD experience high rates of sexual dysfunction, with many men reporting their sexual functioned worsened following surgery. Patients with active disease, depression, and multiple surgeries were more likely to experience ED. Further research needs to be done to characterize sexual dysfunction in men with CD.

Footnotes

Authors' Contribution: Study concept and design: Kelly Scarberry, Justin T Brady and Emily Steinhagen; analysis and interpretation of data: Kelly Scarberry, Justin T Brady and Kyle Scarberry; drafting of the manuscript: Kelly Scarberry; critical revision of the manuscript for important intellectual content: Justin T Brady, Kyle Scarberry, Sharon L Stein, and Emily Steinhagen; statistical analysis: Sharon L Stein and Kyle Scarberry.

Conflict of Interests: It is not declared by the author.

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References

1. Baumgart DC, Sandborn WJ. Crohn's disease. *Lancet*. 2012;**380**(9853):1590–605. doi: 10.1016/S0140-6736(12)60026-9. [PubMed: 22914295].
2. Johnston RD, Logan RF. What is the peak age for onset of IBD? *Inflamm Bowel Dis*. 2008;**14 Suppl 2**:S4–5. doi: 10.1002/ibd.20545. [PubMed: 18816745].
3. Larson DW, Pemberton JH. Current concepts and controversies in surgery for IBD. *Gastroenterology*. 2004;**126**(6):1611–9. [PubMed: 15168371].

4. Greenstein AJ, Lachman P, Sachar DB, Springhorn J, Heimann T, Janowitz HD, et al. Perforating and non-perforating indications for repeated operations in Crohn's disease: Evidence for two clinical forms. *Gut*. 1988;**29**(5):588–92. [PubMed: 3396946]. [PubMed Central: PMC1433651].
5. Farmer RG, Hawk WA, Turnbull RB Jr. Indications for surgery in Crohn's disease: Analysis of 500 cases. *Gastroenterology*. 1976;**71**(2):245–50. [PubMed: 1084841].
6. Wolters FL, Russel MG, Stockbrugger RW. Systematic review: Has disease outcome in Crohn's disease changed during the last four decades? *Aliment Pharmacol Ther*. 2004;**20**(5):483–96. doi: 10.1111/j.1365-2036.2004.02123.x. [PubMed: 15339320].
7. Kalafateli M, Triantos C, Theocharis G, Giannakopoulou D, Koutroumpakis E, Chronis A, et al. Health-related quality of life in patients with inflammatory bowel disease: A single-center experience. *Ann Gastroenterol*. 2013;**26**(3):243–8. [PubMed: 24714279]. [PubMed Central: PMC3959431].
8. Casati J, Toner BB, de Rooy EC, Drossman DA, Maunder RG. Concerns of patients with inflammatory bowel disease: A review of emerging themes. *Dig Dis Sci*. 2000;**45**(1):26–31. [PubMed: 10695609].
9. Timmer A, Kemptner D, Bauer A, Takses A, Ott C, Furst A. Determinants of female sexual function in inflammatory bowel disease: A survey based cross-sectional analysis. *BMC Gastroenterol*. 2008;**8**:45. doi: 10.1186/1471-230X-8-45. [PubMed: 18834529]. [PubMed Central: PMC2571095].
10. Timmer A, Bauer A, Dignass A, Rogler G. Sexual function in persons with inflammatory bowel disease: A survey with matched controls. *Clin Gastroenterol Hepatol*. 2007;**5**(1):87–94. doi: 10.1016/j.cgh.2006.10.018. [PubMed: 17234557].
11. Marin L, Manosa M, Garcia-Planella E, Gordillo J, Zabana Y, Cabre E, et al. Sexual function and patients' perceptions in inflammatory bowel disease: A case-control survey. *J Gastroenterol*. 2013;**48**(6):713–20. doi: 10.1007/s00535-012-0700-2. [PubMed: 23124604].
12. Trachter AB, Rogers AI, Leiblum SR. Inflammatory bowel disease in women: Impact on relationship and sexual health. *Inflamm Bowel Dis*. 2002;**8**(6):413–21. [PubMed: 12454617].
13. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. *J Gen Intern Med*. 2001;**16**(9):606–13. [PubMed: 11556941]. [PubMed Central: PMC1495268].
14. Irvine EJ, Zhou Q, Thompson AK. The short inflammatory bowel disease questionnaire: A quality of life instrument for community physicians managing inflammatory bowel disease. CCRPT investigators. Canadian Crohn's relapse prevention trial. *Am J Gastroenterol*. 1996;**91**(8):1571–8. [PubMed: 8759664].
15. Rosen RC, Riley A, Wagner G, Osterloh IH, Kirkpatrick J, Mishra A. The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*. 1997;**49**(6):822–30. [PubMed: 9187685].
16. Bengtsson J, Lindholm E, Nordgren S, Berndtsson I, Oresland T, Borjesson L. Sexual function after failed ileal pouch-anal anastomosis. *J Crohns Colitis*. 2011;**5**(5):407–14. doi: 10.1016/j.crohns.2011.04.002. [PubMed: 21939914].
17. Larson DW, Davies MM, Dozois EJ, Cima RR, Piotrowicz K, Anderson K, et al. Sexual function, body image, and quality of life after laparoscopic and open ileal pouch-anal anastomosis. *Dis Colon Rectum*. 2008;**51**(4):392–6. doi: 10.1007/s10350-007-9180-5. [PubMed: 18213489].
18. Gorgun E, Remzi FH, Montague DK, Connor JT, O'Brien K, Loparo B, et al. Male sexual function improves after ileal pouch anal anastomosis. *Colorectal Dis*. 2005;**7**(6):545–50. doi: 10.1111/j.1463-1318.2005.00895.x. [PubMed: 16232233].
19. Riss S, Schwameis K, Mittlbock M, Pones M, Vogelsang H, Reinisch W, et al. Sexual function and quality of life after surgical treatment for anal fistulas in Crohn's disease. *Tech Coloproctol*. 2013;**17**(1):89–94. doi: 10.1007/s10151-012-0890-x. [PubMed: 22956209].
20. Nugent KP, Daniels P, Stewart B, Patankar R, Johnson CD. Quality of life in stoma patients. *Dis Colon Rectum*. 1999;**42**(12):1569–74. [PubMed: 10613475].
21. Manderson L. Boundary breaches: The body, sex and sexuality after stoma surgery. *Soc Sci Med*. 2005;**61**(2):405–15. doi: 10.1016/j.socscimed.2004.11.051. [PubMed: 15893055].
22. Averyt JC, Nishimoto PW. Addressing sexual dysfunction in colorectal cancer survivorship care. *J Gastrointest Oncol*. 2014;**5**(5):388–94. doi: 10.3978/j.issn.2078-6891.2014.059. [PubMed: 25276411]. [PubMed Central: PMC4173048].
23. Bel LG, Vollebregt AM, Van der Meulen-de Jong AE, Fidder HH, Ten Hove WR, Vliet-Vlieland CW, et al. Sexual dysfunctions in men and women with inflammatory bowel disease: The influence of IBD-related clinical factors and depression on sexual function. *J Sex Med*. 2015;**12**(7):1557–67. doi: 10.1111/jsm.12913. [PubMed: 26054013].
24. Mahmood S, Nusrat S, Crosby A, Zhao YD, Ali T. Assessment of sexual function among inflammatory bowel disease patients. *Am J Gastroenterol*. 2015;**110**(4):601–3. doi: 10.1038/ajg.2015.53. [PubMed: 25853205].
25. Riviere P, Zallot C, Desobry P, Sabate JM, Vergniol J, Zerbib F, et al. Frequency of and factors associated with sexual dysfunction in patients with inflammatory bowel disease. *J Crohns Colitis*. 2017;**11**(11):1347–52. doi: 10.1093/ecco-jcc/jjx100. [PubMed: 28981625].
26. Braun M, Wassmer G, Klotz T, Reifenrath B, Mathers M, Engelmann U. Epidemiology of erectile dysfunction: Results of the 'cologne male survey'. *Int J Impot Res*. 2000;**12**(6):305–11. doi: 10.1038/sj.ijir.3900622. [PubMed: 11416833].
27. Dunn KM, Croft PR, Hackett GI. Association of sexual problems with social, psychological, and physical problems in men and women: A cross sectional population survey. *J Epidemiol Community Health*. 1999;**53**(3):144–8. [PubMed: 10396490]. [PubMed Central: PMC1756846].
28. Laumann EO, Nicolosi A, Glasser DB, Paik A, Gingell C, Moreira E, et al. Sexual problems among women and men aged 40-80 y: Prevalence and correlates identified in the global study of sexual attitudes and behaviors. *Int J Impot Res*. 2005;**17**(1):39–57. doi: 10.1038/sj.ijir.3901250. [PubMed: 15215881].