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## Operative versus nonoperative management for diverticulitis complicated by abscess

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# Operative versus nonoperative management for diverticulitis complicated by abscess

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**ABSTRACT** A clinical decision report using:

You K, Bendl R, Taut C, et al. Randomized clinical trial of elective resection versus observation in diverticulitis with extraluminal air or abscess initially managed conservatively. *Br J Surg*. 2018;105(8):971-979. <https://doi.org/10.1002/bjs.10868>

for a patient with a recurrent diverticulitis complicated by abscess formation.

**Keywords:** *complicated diverticulitis, nonoperative management, abscess, surgery*

## Clinical-Social Context

Samuel Johnston [pseudonym] is a 60-year-old man who presented to the colorectal surgery clinic for follow-up after a recent hospitalization for worsening diverticulitis. During his hospitalization, he underwent CT-guided drainage of a deep pelvic abscess by interventional radiology (IR). He was then discharged on IV antibiotics. Mr. Johnston noted that since discharge, the drainage from his IR drain had changed from serosanguineous to frank purulent fluid. He also complained of intermittent periumbilical cramping abdominal pain in the setting of intermittent fevers, fatigue, and anorexia. Mr. Johnston was also distressed by how his condition was worrying his wife and children. His wife, Sandra, tearfully explained how overwhelmed the family felt. They were worried about relying on home skilled nursing visits for an extended period. They were especially concerned that his decline since discharge would require surgery. Urgent CT of the abdomen and pelvis with contrast demonstrated persistent sigmoid diverticulitis as well as an abscess with an interval decrease in size.

Reassured that the abscess was draining, they elected to continue with IV antibiotic therapy at home and defer discussion of early surgical intervention for a week. Upon returning to the clinic, Mr. Johnston felt much improved physically. However, his wife, Sandra Johnston, expressed concern that his mood continued to decline. Mr. Johnston agreed that since leaving the hospital he had become despondent and increasingly frustrated by the prolonged recovery: "I just want to get over this infection and get back to work! Should we just do surgery now? I don't want to be dragging everyone down anymore." Mrs. Johnston explained that her husband was struggling to accept that he needed her to take care of him. Prior to his initial hospitalization, he led an active and overall healthy life, only slowed down by his arthritis and one prior episode of diverticulitis. They wondered, "Is there a chance of not needing surgery at all?"

ALIX BERNHOLTZ, MS, and ABBIE R. BAUER are medical students at Wayne State University School of Medicine. ABBIE R. BAUER is a student editor of this journal.



## Clinical Question

Does elective surgical resection after nonoperative management of diverticulitis complicated by abscess formation reduce recurrence?

## Research Article

You K, Bendl R, Taut C, et al. Randomized clinical trial of elective resection versus observation in diverticulitis with extraluminal air or abscess initially managed conservatively. *Br J Surg*. 2018;105(8):971-979. <https://doi.org/10.1002/bjs.10868><sup>1</sup>

## Description of Related Literature

To determine the most recent society recommendations regarding the treatment of sigmoid diverticulitis a search of PubMed was performed using the terms “sigmoid diverticulitis” and “American Society of Colon and Rectal Surgeons” which returned 8 results. This was further narrowed to 2 with a filter for 2012-2022. Feingold et al. outlines the most recent ASCRS practice parameters for the treatment of sigmoid diverticulitis. This includes the recommendation that elective colectomy is typically advised after a patient fully recovers from an episode of complicated diverticulitis. The Clinical Practice Guideline Task Force of the American Society of Colon and Rectal Surgery (ASCRS) acknowledges that this recommendation is based on retrospective studies with small sample sizes.<sup>2</sup>

A literature review on the topic of the necessity of colectomy after recurrent diverticulitis complicated by abscess formation was then conducted using the PubMed database. The use of the keywords “diverticulitis,” “conservative treatment,” and “recurrence” yielded 182 results which was narrowed to 80 results by applying filters for English and 2002-2022. The abstracts were then reviewed for inclusion of nonoperative management of diverticular abscess to reflect Mr. Johnston’s clinical situation.

Hawkins et al. attempts to summarize the fundamentals of the management of diverticular disease and the research that informs current best practices.<sup>3</sup> Multiple retrospective studies of single institution patient populations treated for complicated diverticulitis with abscess concluded that observation after nonoperative management can be a safe option with a relatively low rate of recurrence.<sup>4,5</sup> A retrospective study of patients with diverticular abscess treated with nonoperative intent both initially and long term reported that such a nonoperative intent is safe with low rates of urgent surgical intervention.<sup>6</sup>

Lamb et al. completed a systematic review and meta-analysis investigating recurrence rates after successful nonsurgical management of acute diverticulitis with abscess formation. Overall recurrence rates were high. Of the total 1051 patients represented by the studies included in this analysis, only 28% had no episodes of recurrence and did not undergo surgery.<sup>7</sup>

van de Wall et al. conducted a randomized controlled trial (RTC) comparing quality of life in patients undergoing observation versus elective surgical resection after successful nonoperative management of acute Hinchey II diverticulitis. There were 47 patients who received surgical treatment and 43 patients who received observational management. Eighteen and 23 patients had severe adverse events in the first 6 months after treatment, respectively. The surgical treatment patients had a Gastrointestinal Quality of Life Index (GIQLI) of 114.4 at 6 months’ follow-up which was significantly higher than the conservative management patients’ 100.4 (mean difference 14.2, 95% CI 7.2-21.2 p<0.0001).<sup>8</sup> In a five-year follow-up of the van de Wall et al. paper, an intention to treat analysis showed that the higher quality of life in the surgical group compared to the observational group did not meet the minimum important difference for GIQLI, and therefore conclusions could not be drawn about which intervention yielded higher quality of life for patients.<sup>9</sup> These papers show that surgical intervention may provide higher quality of life for patients in the short term, but the benefits of surgical intervention for acute diverticulitis in the long term is not clear.

You et al. conducted an RTC directly comparing observation to elective surgical resection after successful nonoperative management of acute Hinchey II diverticulitis. While recurrence rates were significantly higher and recurrence occurred significantly earlier for this study’s observation only group in comparison to the elective surgery group, the recurrence rates for those observation only patients overall were low.<sup>1</sup> Because this study had a longer follow-up period, but was otherwise similar to the other RCT described in this paper, this publication was chosen for the critical appraisal.



The body of literature presented may be considered to have a Grade A Strength of Recommendation based on the SORT criteria for non-surgical management of complicated diverticulitis.<sup>10</sup>

## Critical Appraisal

Acute complicated diverticulitis is diverticulitis associated with abscess, perforation, fistula, stricture, and/or obstruction and can be stratified using the Hinchey classification system.<sup>3</sup> You et al. published the findings of a single-center, sequential design RCT comparing the recurrence rates of diverticulitis after successful nonoperative management of a first episode of acute diverticulitis followed by elective resection versus observation. Secondary outcomes included time to recurrence and treatment of recurrence, readmission, mortality, and post-operative complications (surgery arm only). The primary endpoint was 24 months.<sup>1</sup>

This study enrolled adult patients presenting to a single institution between 2011 and 2014 with a first episode of acute diverticulitis of the sigmoid colon with extraluminal air with or without abscess on initial CT. Fifteen of those patients who were initially screened, subsequently failed nonoperative management. After successful nonoperative management (including NPO, IV fluids, IV antibiotics, repeat CT, and CT-guided percutaneous drainage of abscess as indicated) and subsequent outpatient colonoscopy, 107 patients were assigned via computer-generated simple randomization into two groups: elective surgery (n=26) and observation (n=81). The use of a centralized off-site computer with the separation of the generator of the allocation from the executor ensured allocation concealment. The elective resection group underwent minimally invasive elective resection of the sigmoid colon with colorectal anastomosis. There was no mention whether these were performed with or without diverting ileostomy. Observation consisted of a history and physical examination with diagnostic testing if clinically indicated. Both groups were followed in the outpatient setting every three months and telephone interviews were conducted if a patient was not able to be seen in person. Reference recurrence rates were chosen for each group based on corresponding similar retrospective analyses. These rates were then used with a two-sided type I error of 0.05 and a power of 0.9 to set the stopping boundaries for sample size. The final groups were similar in BMI, age, sex, comorbidities, and estimated morbidity and mortality risk (using Cr-POSSUM scores).

An intention-to-treat analysis was carried out in both the elective resection and the observation groups. When compared with elective resection, observation following nonoperative management of an initial episode of acute sigmoid diverticulitis with extraluminal air and/or abscess was associated with significantly increased rates of recurrent diverticulitis (P=0.019) and a significantly shorter time to recurrence (P=0.015). However, there was no significant difference in the severity (complicated versus uncomplicated) of recurrence between the two study groups (P=1.000) and all the 28 patients who presented with recurrent diverticulitis recovered with repeat nonoperative management.

As this study followed patients consistently and there were no patients lost to follow up, there is unlikely to be incomplete account of recurrence due to presentation to an outside facility. However, an important limitation of this study is the relatively short follow-up period of 24 months. The recurrence rate and associated personal and financial burden outside of that timeframe is unknown. Additionally, this could fail to identify any patients with multiple episodes of recurrence.

As a high quality individual RCT, this study is level 1 evidence based on the SORT criteria.<sup>10</sup> It was registered with ClinicalTrials.gov (NCT01986686). The registered study protocol limited inclusion eligibility to patients with a first episode of acute diverticulitis with abscess. However, the published data included patients with extraluminal air with or without abscess on CT. Current ASCRS practice parameters do not consider extraluminal air alone on imaging to be complicated disease.<sup>2</sup> Interestingly, the authors argue that 19% of those with only extraluminal air on initial CT subsequently develops an abscess on repeat imaging during their index admission supports reclassifying this imaging finding as complicated disease. However, they do not explicitly justify the deviation from the registered study protocol or address the potential impact on interpretation of these data. The study included patients both with and without abscesses but did not make a distinction between these two groups in the randomization process or reporting of overall findings. This could represent a publication bias. This decreases the study's reproducibility and makes the results less informative for Mr. Johnston's medical team. Additionally, patients in the observation group only received diagnostic testing, but not nonoperative management. If Mr. Johnston's diagnostic testing revealed a recurrence, his medical team is unlikely to just observe and not treat him. So the results of this study are not completely reproducible in this patient.



## Clinical Application

The primary goal during the acute phase of diverticulitis is avoidance of surgery.<sup>3</sup> However, there is much controversy surrounding management after the acute phase has resolved. As Mr. Johnston was not critically ill, he elected to continue with nonoperative management of his acute complicated diverticulitis, with the recommendations of his medical team. Regarding his long-term treatment plan, Mr. Johnston was offered conservative management with observation or surgical resection including primary sigmoid resection and colorectal anastomosis with or without a diverting ileostomy versus sigmoidectomy with colostomy (Hartmann's procedure). An in-depth discussion then took place between Mr. Johnston, his wife, and the colorectal surgeon. The discussion focused on the impact each treatment strategy might have on his quality of life. Mr. Johnston's primary concern was avoiding future recurrence of diverticulitis, the associated disruption to his daily activities of living, and the associated mental and financial strain on his family. This made him wary of proceeding with observation alone. However, as demonstrated by You et al., elective resection is not 100% protective against recurrent diverticulitis.<sup>1</sup> Mr. Johnston emphasized that if he were to pursue surgery, managing a long-term ostomy device would be too disruptive for both him and his family. Aware that restoration of bowel continuity may not be achieved in up to 50% of diverticulitis patients who undergo Hartmann's procedure,<sup>2</sup> Mr. Johnston elected to proceed with tentatively scheduling minimally invasive primary sigmoid resection and colorectal anastomosis without diverting ileostomy.

## New Knowledge Related to Clinical Decision Science

This clinical decision report based on the case of Mr. Samuel Johnston, a 60-year-old male with recurrent diverticulitis complicated by abscess formation highlights the importance of considering the strength of evidence behind evidence-based practice parameters. A recommendation for surgical intervention based on inconsistent limited quality evidence may result in patients not considering other management options, thinking that "recommended is best" without knowing the whole story. This could be especially likely to occur in patients with low medical-literacy or aren't comfortable asking their physician for clarification.

There are risks and harms to the controversy over the optimal long-term management strategy for patients with diverticulitis complicated by abscess formation who have successfully been treated nonoperatively. With only limited patient-oriented evidence available about the necessity of elective surgical resection after nonoperative management of complicated diverticulitis, patients must rely on the discretion and expertise of their provider. If there isn't a collaborative and trusting patient-provider relationship, a lack of evidence-based guidance could set an already overwhelmed patient such as Mr. Johnston even further adrift. On the other hand, this controversy presents a clear opportunity for providers to tailor the treatment plan to the individual patient situation. Careful consideration of a patient's social situation provides physicians with a contextual framework through which to view available treatment options. Together, the experiences of the patient and the physician can inform a plan with the best chance for success.

When counselling the Johnston family, it was important to understand the role that social structures had for clinical decision making. In this case, there are elements of stigma associated with the transition from able-bodied to dependent-requiring family support associated with this illness. This transition manifests in the emotional reaction to the illness. Treating the emotions within the family structure is part of the clinical decision making. One wonders to what extent a less social resourced kinship structure would change the clinical decision of operative versus non-operative management.<sup>11</sup>

## Conflict Of Interest Statement

The authors declare no conflicts of interest.

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