Intra-Abdominal Abscess Drainage: Interval to Surgery

Jong Park, MD, MPH¹ Hearn W. Charles, MD¹

¹ Section of Vascular & Interventional Radiology, NYU Langone Medical Center, New York, New York

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Address for correspondence and reprint requests Hearn W. Charles, MD, Section of Vascular & Interventional Radiology, NYU Langone Medical Center, 560 First Ave., New York, NY 10016 (e-mail: hearns.charles@nyumc.org).

Abstract

Keywords

- interventional radiology
- abscess
- percutaneous drainage
- abdominal
- appendicitis
- Crohn's disease
- diverticulitis

Placement of percutaneous drainage catheters has become first-line therapy in the treatment of patients with intra-abdominal abscesses. Catheters can be used to avoid surgical intervention or to improve surgical outcomes. This article discusses the current evidence describing the optimal interval between percutaneous drainage procedures and surgery, focusing on patients with Crohn's disease, appendicitis, and diverticulitis.

Objectives: Upon completion of this article, the reader will be able to identify the current evidence suggesting optimal interval times to surgery for patients with intra-abdominal abscess.

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The principle of intra-abdominal infection management is to control the infectious source. In cases complicated by abscess formation, percutaneous drainage has emerged as the first-line therapy over surgical intervention due to lower complication rates and shorter length of hospital stay.^{1–7} The American Society of Colon and Rectal Surgery, Expert Panels of the Surgical Infection Society, the Infectious Diseases Society of America, and the World Society of Emergency Surgery currently recommend, where feasible, percutaneous abscess drainage over surgical drainage. This strategy is

supported by strong published clinical evidence in support of percutaneous drainage as a first-line treatment to manage appendicitis, diverticulitis, and Crohn's disease.^{2,4,8}

As early as 1904, initial treatment with abscess drainage was advocated for complicated appendicitis to achieve defervescence and clinical optimization before surgery.⁹ However, there is no clear consensus on the appropriate wait time until the elective appendectomy. Based on a survey in 2007, surgeons in Great Britain routinely performed appendectomy at 6 weeks to 3 months after the initial presentation.¹⁰ Few retrospective studies confirmed this long time interval to an elective appendectomy. Roach et al described 32 patients treated with abscess drainage and/or antibiotics therapy, delaying ~6 weeks from the initial presentation to subsequent laparoscopic appendectomy.¹¹ You et al reported a longer interval to surgery; 15 of 56 patients had percutaneous abscess drainage and waited an average of 64 days after their initial presentation, prior to undergoing an appendectomy.¹² Reported intervals to surgery are similar in the adult and pediatric literature. In a study by Keckler et al, 52 pediatric patients had their drainage catheters removed at ~6 days, and interval to appendectomy was ~62 days after the initial presentation.¹³

Even more controversial than the timing of elective appendectomy is the role of surgical resection after successful

drainage and the resolution of clinical symptoms. The recommendation for interval appendectomy is largely based on the risk of recurrence and concern for missing an underlying malignancy; malignancy is incidentally discovered in 2 to 10% of patients during appendectomy.^{2,4,10,14,15} Thus some authors have advocated a more selective approach, possibly limiting the delayed appendectomy to patients >40 years of age. Children have a low risk of concomitant malignancy and may therefore be spared from surgery.^{2,4,14} Additional debate over recurrence and complication rates challenges the need for interval appendectomy. The reported recurrence rate of appendicitis is 10 to 25%, with a complication rate of 23%, supporting the view that 75 to 90% of interval appendectomies may be unnecessary.^{10,15} Investigative efforts should then be undertaken to identify the risk factors associated with disease recurrence.

In the management of Crohn's disease and diverticular abscess, percutaneous drainage has converted emergency surgery into elective surgery and has increased the possibility of a successful one-stage surgical procedure rather than the more complicated and extensive two-stage procedure.^{4,5,16–18} Through delayed diverticular surgery, 74 to 94% of resections have been performed as one-stage primary anastomoses, a strategy that improves quality of life, reduces cost, and reduces morbidity and mortality.^{19,20} Conversely, 40 to 45% of the emergency diverticular surgeries were performed with a Hartmann procedure and a diverting ostomy as part of a two-stage procedure with the subsequent reanastomosis 3 to 6 months later. However, it has been reported that 30 to 37% of patients do not have their ostomies reversed.^{19,20}

Elective diverticular surgery is generally performed 4 to 6 weeks after initial drainage.⁶ In one prospective study of 17 patients with diverticular abscess, Saini et al reported a shorter interval to elective colonic resection, which was performed 10 days to 3 weeks following abscess drainage.²¹ Prolonged drainage (ranging from 8 days to 6 weeks) may be necessary if a fistula is present. Rypens et al²² demonstrated that 8 of 16 patients with Crohn's disease-associated abscess had successful percutaneous abscess drainage; the subsequent elective surgery occurred an average of 25 days following initial percutaneous abscess drainage (range: 8 days – 2 months). In 33 of the 66 patients who underwent percutaneous drainage as the initial therapy for Crohn's disease abscess, Gutierrez et al noted that one third had subsequent surgery for definitive abscess treatment within 1 year.²³

The success of conservative diverticular disease management has led some investigators to argue against obligatory elective surgery.²⁴ Abscess size and location have been suggested as an influencing factor on the severity and course of the disease. Smaller diverticular abscesses (<3 cm) may not uniformly need surgical intervention based on reports that 41% of patients achieve resolution of symptoms and 23% improve with mild recurrent or persistent symptoms that do not require surgery.²⁵ Ambrosetti et al described 73 patients treated conservatively with antibiotics, with and without abscess drainage, of which 71% of pelvic abscesses and 51% of mesocolic abscesses ultimately required surgery.²⁶ Based on these results, the authors suggested that an elective colectomy is reasonable after drain-

age of a pelvic abscess but not necessarily following percutaneous drainage of a mesocolic abscess.^{6,26}

Summary

In the management of intra-abdominal abscess, initial management using intravenous antibiotics administration and percutaneous drainage has become the standard of care. Lower complication rates, shorter hospital stay, and lower cost have been achieved when patients are stabilized and optimized first, prior to undergoing surgery on an elective basis. What is less clear is the appropriate "cool-off" period prior to proceeding with surgical intervention. Wait time varies widely depending on the type of surgical procedures. For complicated appendicitis, patients are reported to wait 6 weeks to 3 months after their initial presentation and percutaneous intervention before undergoing elective appendectomy. Shorter delay until elective surgery has been reported for diverticulitis complicated by abscess formation, ranging from 10 days to 6 weeks. Elective surgical intervention for abscess complicating Crohn's disease had the widest time range, from 8 days to 1 year. The success of percutaneous abscess drainage has led some investigators to question the need for obligatory surgical intervention; instead, the argument has been for a more selective surgical approach and, for some clinical scenarios, no surgical intervention at all. This is especially true for appendicitis for which clinical investigation to identify potential risk factors for non-surgical disease recurrence is recommended by the authors of this current article.

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