

Nonoperative Management of Complicated Appendicitis with Appendiceal Fecaliths

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ABSTRACT

Nonoperative management and interval appendectomy after successful nonoperative treatment has been a standard treatment strategy in complicated appendicitis. However, the risk factors for failure of nonoperative management and those for development of recurrent appendicitis remain unclear. This Review aims to study the current data on the association between complicated appendicitis and appendiceal fecaliths which have already been well studied in uncomplicated appendicitis.

Keywords: Complicated appendicitis; Fecalith; Nonoperative management; Predictor

DESCRIPTION

Complicated appendicitis is defined as acute inflammatory changes with appendiceal rupture and subsequent abscess or phlegmon formation [1]. Since complicated appendicitis varies in clinical presentation and severity, the optimal treatment strategy remains unclear. The risk factors for failure of nonoperative management require clarification because the rates of complications, extended resection, and conversion to open surgery increase with the spread of appendiceal inflammation [2]. Elective interval appendectomy after successful nonoperative treatment also remains controversial [3].

Complicated appendicitis with fecaliths

The association between appendicitis and appendiceal fecaliths has long been studied. Some studies suggest that an appendicolith is not always the cause of complicated appendicitis, but may be a risk factor for progression to complicated appendicitis or recurrence [4-8]. In one study of resected complicated appendicitis specimens, the fecalith prevalence was 27.5% in adults and 56.1% in pediatric patients [4]. Fecaliths were also seen in the normal appendix in 28.6% of cases, but this rate was too low to consider fecaliths the most common cause of appendicitis, especially in adults. That study also found no significant correlation between fecaliths on Computed Tomography (CT) and in the pathology specimen; in other words, CT cannot detect all appendiceal fecaliths. In the future, the rate of fecalith detection should improve. We feel that CT with thin slices in the coronal/sagittal planes, combined with

ultrasonography or magnetic resonance imaging, must be used routinely to detect fecaliths preoperatively.

Risk factors for failure of nonoperative treatment in complicated appendicitis

The presence of an appendicolith, lack of an abscess, and elevated C-reactive protein levels increase the risk of failure of nonoperative treatment in complicated appendicitis [7-10]. We found that the risk of failure varied with the location of the appendiceal fecalith; the presence of a fecalith in the proximal appendix significantly increased the likelihood of nonoperative treatment failure compared with cases with one in the middle or distal appendix, as well as cases with no fecaliths, among adults with complicated appendicitis [9]. Etiologically, a proximal appendiceal fecalith is more likely to lead to insufficient drainage of purulent matter from the appendix than one elsewhere. In addition, less frequent use of clinical care pathways and a higher postoperative complication rate were seen for unscheduled surgery after failure of nonoperative treatment than in cases with emergency appendectomy as the initial treatment. In multivariate analyses, we found that a proximal appendiceal fecalith was the best predictor of failure of nonoperative treatment for complicated appendicitis in adults. Therefore, we perform aggressive emergency surgery in cases of complicated appendicitis with proximal fecaliths, while cases with fecaliths in the middle or distal appendix are treated nonoperatively. This strategy markedly reduced the failure rate of nonoperative treatment for complicated appendicitis; the postoperative course and complication rates also improved. However, our original

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study was limited by its retrospective nature and small sample size. Large prospective studies are required to determine the optimal treatment strategy for complicated appendicitis in adults according to the location of appendiceal fecaliths.

Follow-up after nonoperative treatment

Patients with resolved complicated appendicitis are recommended to undergo elective interval appendectomy around 8 weeks after the appendicitis resolves, for two reasons [1,2]. First, an appendiceal neoplasm is a cause of appendicitis. The rate of neoplasm among patients with appendicitis aged over 40 years was 16%, compared with 4% in younger patients [11]. Therefore, patients with successful nonoperative treatment, especially those over 40 years old, should undergo screening colonoscopy before appendectomy due to an increased risk of neoplasm. Second, appendicitis can recur in some patients with complicated appendicitis after resolution via the initial nonoperative treatment. The reported recurrence rate ranges from 6% to 20%, which is too low to perform interval appendectomy in all patients with complicated appendicitis [12]. Recently, interval appendectomy for complicated appendicitis has been controversial because of the low recurrence rate, milder clinical course than the primary episode, and conjecture regarding cost-effectiveness [12]. However, patients deemed more likely to experience recurrence should undergo interval appendectomy before the appendicitis exacerbates. Therefore, it is necessary to elucidate risk factors for recurrence after nonoperative management, and for nonoperative treatment failure. An epidemiological study of complicated appendicitis found that the presence of appendiceal fecaliths predicted recurrent appendicitis after successful nonoperative treatment, in addition to an association between the recurrence rate of complicated appendicitis and location of appendiceal fecaliths [5].

Issues requiring further study

A few issues require further investigation. First, complicated appendicitis includes multiple clinical entities, ranging from simple microperforations to large abscesses. The inclusion of severe cases, in which the appendix is unidentifiable on CT due to necrosis, can make it difficult to precisely determine the risk of nonoperative treatment failure because of the difficulty of determining the location of appendiceal fecaliths. Although previous randomized controlled trials included severe cases [6,13], finer-grained categorization may help elucidate the effects of the location of appendiceal fecaliths on the success of treatment for complicated appendicitis in adults. Second, nonoperative treatment failure and recurrence should be defined more clearly. Some studies have classified percutaneous drainage as treatment failure, while others considered only delayed surgery as nonoperative treatment failure [7-15].

CONCLUSION

Although percutaneous drainage with antibiotics is more effective and has better outcomes than antibiotics alone, appendiceal abscesses are sometimes located dorsal to the ileocecal area, where drainage can be difficult. Successful drainage of complicated appendicitis could be distinguished from nonoperative treatments without drainage. Multicenter studies with large sample sizes

addressing these issues will allow the development of better treatment strategies for complicated appendicitis in adults.

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