



Coming Full Circle on Appendicitis

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Editorial

130 years ago the Harvard pathologist, Reginald Fitz, provided compelling evidence, through publication and public presentations, that the appendix was the source of a variety of right lower quadrant abdominal diseases, and recommended early appendectomy as the most effective treatment [1]. Charles McBurney and other pioneering American surgeons quickly picked up Fitz's gauntlet and early appendectomy rapidly replaced medical management of appendicitis as the standard of care [2,3]. However, in the modern era, interest and advocacy for primary antibiotic therapy for acute appendicitis, first described as early as 1959 by Coldrey, has steadily grown, most recently supported by Salminen and colleagues in the APPAC trial, a randomized clinical trial in Finland of antibiotic therapy vs. appendectomy for the treatment of uncomplicated acute appendicitis in adults [4,5]. Is an "antibiotics first" strategy a suitable alternative to early appendectomy? [6,7] Have we indeed "come full circle" to medical treatment of appendicitis?

There are at least five medical reasons why primary antibiotic therapy, coupled with percutaneous drainage of abscesses when present, deserves consideration for the treatment of appendicitis:

- While the morbidity and mortality of appendectomy is low, it is higher when performed for complicated appendicitis, or when performed on patients with significant medical co-morbidities or prior abdominal surgeries [8].
- With modern antibiotics and supportive care, there is a high initial response rate to primary antibiotic therapy (even with complicated appendicitis) of ~75%, a low risk of treatment failure (10-15%) and a low rate of disease recurrence (also 10-15%) [5,9-13].
- Following successful initial treatment, the long need for any surgical intervention (including routine interval appendectomy) is also low [14,15].
- With careful patient selection and follow-up, the risk of missing a clinically-significant malignancy of the appendix or right colon should be small [15]. There may be survival value in saving the appendix, such as decreasing the risk of recurrent *Clostridium difficile* infection [16].

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We know that in most circumstances laparoscopic or open appendectomy, especially for early uncomplicated appendicitis, can be performed expeditiously, at low cost and with low morbidity and mortality. In young, otherwise healthy patients with early stage disease, prompt appendectomy has clear economic advantage over primary medical therapy [17]. With current pressures on hospital beds and efforts to decrease both the initial hospital length of stay and the rate of readmissions because of treatment failures and recurrence, early appendectomy becomes even more attractive. Primary antibiotic therapy prolongs hospitalization, risks adverse reactions to antibiotics and adds uncertainty (the risk of treatment failure and recurrence) that is obviated in nearly all cases by prompt appendectomy. The difficulty in even convincing patients (or parents of patients) to consider primary antibiotic therapy rather than appendectomy for acute non-perforated appendicitis was recently noted by Svensson and colleagues [13]. Only 40% of families invited to participate in their prospective, randomized trial of antibiotics versus appendectomy for acute non-perforated appendicitis in children agreed to participate. Of the 22 children who underwent successful medical treatment and who did NOT develop recurrent appendicitis (one child did develop recurrent appendicitis at 9 months), 6 patients (27%) underwent appendectomy within 1 year – 1 at the parents' request, and 5 because of recurrent right lower quadrant abdominal pain (but with a fibrotic appendix noted at the time of surgery). At least in the US we have been very successful in convincing the public of the superiority of early appendectomy over primary antibiotic therapy. However, in patients presenting with complicated appendiceal disease (e.g., phlegmon or abscess) and in patients with significant medical comorbidities or a surgically "hostile" abdomen from prior surgeries or disease, a trial of antibiotic therapy, with percutaneous drainage of abscesses when present, is prudent, reserving surgery for treatment failures and for patients with

generalized peritonitis requiring expeditious source control. As noted above, most of these patients will respond to antibiotic therapy and will not require a subsequent appendectomy. Interval appendectomy should be restricted to patients with early recurrence of symptoms, and to those patients with radiographic evidence of an appendicolith (in fact, radiographic evidence of an appendicolith was an explicit exclusion criterion of the APPAC trial) [5]. In individuals older than 40, close clinical follow-up and work-up (including post-treatment CT scan and colonoscopy at 3-6 months) is warranted, because of the risk, albeit small, of occult appendiceal or colonic neoplasms. There is a final important reason to consider primary antibiotic therapy for acute appendicitis. "Coming full circle" and including primary antibiotic therapy in our armamentarium of treatment recommendations for acute appendicitis supports patient autonomy. With better information, patients and clinicians alike can make better, more informed health care choices. In the interest of patient-centered medical care, this can only be applauded.

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