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Editorial

Acute appendicitis: should we go back to the conservative treatment used in the XIX century?

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Acute appendicitis: should we go back to the conservative treatment used in the XIX century?

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We are all aware that antibiotics did not exist in the XIX century, but as early as 1830, Gorbel coined the terms *typhlitis* and *perityphlitis* and proposed a conservative approach to this disease. It was not until 1886 that Morton performed the first curative appendectomy. Two years later, McBurney performed the first published appendectomy in a nonperforated appendix, and in 1889 Murphy declared that resection was the only treatment for acute appendicitis. However, in a “Berlin consensus” on appendicitis in 1902, it was recommended that resection should be performed routinely in the first 36 hours, but that past this time, the operation should be postponed until the appendicitis had “cooled”. Nevertheless, surgery remained the most frequently used approach to the management of appendicitis, especially in paediatrics.

In the 1960s, there was a budding interest in the antibiotic treatment of appendicitis (ATA) that has since grown progressively, especially in relation to the adult population, and several authors started to publish reviews on the subject. A 2009 article by Hansson,¹ while limited to the adult population, reported very encouraging results of an ATA trial and seemed poised to become the reference in the management of appendicitis. It presented a recurrence rate of 13% and a considerably lower rate of complications in the ATA group compared to the appendectomy group. However, this study prompted a veritable downpour of letters to the editor with crushing critiques that challenged its results and questioned nearly every figure, with one arguing that randomisation had been incorrectly done (V. Patel), another that it lacked a standardised protocol for diagnosing appendicitis (A. G. Paice); an author even writing that he was “surprised the study managed to be approved by the ethics committee of such an esteemed body” (A. Van Langenber), and six others. It was the first time that nine letters, published in the two following issues of the journal, were received that tore an article apart.²⁻⁹

Two years earlier, in 2007, Andersson¹⁰ had presented a meta-analysis of 61 studies published between 1964 and 2006 on the antibiotic treatment of appendiceal abscesses. In this decade, there was a surge of publications on ATA in the paediatric population: Abes¹¹, Whyte¹², Aprahamian¹³, Henry¹⁴, etc. None of the meta-analyses reached a firm conclusion, and most ended on a similar note, along the lines of “the evidence in the current literature is not sufficient to conclude that ATA is efficacious... further research is needed.” Even a recent

study¹⁵ concluded that ATA requires “further evaluation, preferably in large randomized trials, to reliably inform decision-making.”

But the challenge does not end here. It is not a simple matter of non-operative versus surgical treatment, but also of which of the two is indicated for specific types of appendicitis. An early suppurative appendicitis is not the same as a perforated appendix, a well-developed appendiceal abscess or a case of generalised peritonitis. Likewise, what applies to appendicitis in children aged less than 3 years may not apply to older patients. If we add appendicolith, carcinoid tumours, appendicitis as a manifestation of inflammatory intestinal disease, recurrence in cases in which the appendix is not removed or even episodes of recurrent abdominal pain following treatment whose aetiology may need to be examined, the possibilities multiply.

Another aspect that needs to be considered is the antibiotic regimen used in each study, which in principle should have been established based on the sensitivity of locally prevalent pathogens, since the rise of microbial resistance has decreased the historical effectiveness of triple antibiotic therapy, with an associated increase in the incidence of complications¹⁶.

Therefore, in addition to having to choose between ATA and appendectomy, when antibiotherapy is the only treatment, antibiotics must be carefully selected to cover locally circulating pathogens. To complicate matters further, Andersson¹⁷ suggests that given the possibility of spontaneous resolution, randomised placebo-controlled trials should be conducted to assess the true efficacy of ATA, although the article supports the indication of antibiotic treatment for cases with localised abscess or phlegmone and in surgical high-risk patients.

Abes¹¹ proposes the possibility that in addition to the antimicrobial effect on pathogens themselves, antibiotic therapy may cause regression of hyperplastic lymphoid follicles in the appendix, resolving the obstruction and facilitating healing.

Another of the drawbacks of ATA is the potential for unfavourable outcomes toward perforation, so that in his study on perforated appendicitis, Whyte¹² recommended that decisions regarding surgery be made early in patients that do not respond to antibiotherapy, who amounted to 22 of a total of 58 in the sample (38%).

Furthermore, the transumbilical single-port laparoscopic approach has made concerns regarding the abdominal incision or the use of multiple ports obsolete. The study conducted by Wang¹⁸ that compared laparoscopic and open appendectomy concluded that laparoscopy was the procedure of choice. In addition, surgeons widely believe that appendectomy must be performed in paediatric patients, either as initial treatment or following ATA.

In short, we are going to join the general parting refrain found in the literature: “for the time being and in the absence of further well-designed studies,” we believe that surgery continues to be the gold standard for the treatment of appendicitis in the paediatric age group. Surgery also remains the indisputable first-line treatment of generalised peritonitis. Lastly, ATA, performed under strict monitoring of the treatment and the patient’s condition, may be considered in cases of appendiceal abscess and routinely followed by appendectomy at a later time, although the ideal timing of cold appendectomy remains to be determined, and it is unclear whether the operation would be needed in every case—in our opinion, it should always be performed in paediatric patients.

If ATA is to be attempted, the diagnosis of acute appendicitis must be absolutely certain, so many studies have proposed diagnosis by CT as opposed to ultrasound in order to rule out the possibility of a twisted omentum or ovary or any other cause of acute abdomen different from appendicitis. Antibiotic coverage should be appropriate, with consideration of shifts in bacterial resistance patterns. At present, there is no known predictor for ATA failure, and considering that in published series the recurrence rates range between 7% and 43%, patients must be rigorously monitored during antibiotic therapy, checking clinical symptoms every 4 hours, performing laboratory tests every 24 hours and with a new ultrasound examination at 48 hours.¹¹ Recently, Chang et al¹⁹ conducted a study in 75 patients with a recurrence rate of 50%, and found that C-reactive protein was a predictor of recurrence at levels of more than 103 mg/L.

Last of all, we would like to underscore one more time that the latest reviews published in April¹⁵ and May 2017²⁰ express the need for further research on the subject.

REFERENCES

- Hansson J, Körner U, Khorram-Manesh A, Solberg A, Lundholm K. Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients. *Br J Surg*. 2009;96:473-81.
- Spanos CP. Letter 1: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:1223-4.
- Frich L, Hølmek T. Letter 2: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:1224-5.
- Agarwal BB. Letter 3: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:1225.
- Brown E. Letter 1: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:952; author reply 955.
- Sanabria A, Sánchez C. Letter 2: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:952-3; author reply 955.
- Patel V, Ahmed K, Ashrafi H. Letter 3: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:953; author reply 955.
- Majumder B. Letter 4: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009;96:953-4; author reply 955.
- Van Langenber A. Letter 5: Randomized clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients (*Br J Surg* 2009;96:473-481). *Br J Surg*. 2009 Aug;96(8):954; author reply 955.
- Andersson RE, Petzold MG. Nonsurgical treatment of appendiceal abscess or phlegmon: a systematic review and meta-analysis. *Ann Surg*. 2007;246:741-8.
- Abeş M, Petik B, Kazil S. Nonoperative treatment of acute appendicitis in children. *J Pediatr Surg*. 2007;42:1439-42.
- Whyte C, Levin T, Harris BH. Early decisions in perforated appendicitis in children: lessons from a study of nonoperative management. *J Pediatr Surg*. 2008;43:1459-63.
- Aprahamian CJ, Barnhart DC, Bledsoe SE, Vaid Y, Harmon CM. Failure in the nonoperative management of pediatric ruptured appendicitis: predictors and consequences. *J Pediatr Surg*. 2007;42:934-8.
- Henry MC, Gollin G, Islam S, Sylvester K, Walker A, Silverman BL, et al. Matched analysis of nonoperative management vs immediate appendectomy for perforated appendicitis. *J Pediatr Surg*. 2007;42:19-23.
- Georgiou R, Eaton S, Stanton MP, Pierro A, Hall NJ. Efficacy and safety of nonoperative treatment for acute appendicitis: a meta-analysis. *Pediatrics*. 2017;139:e20163003.
- Tuduri Limousin I, Morcillo Azcárate J, Granero Cendón R, Fernández Pineda I, Aspiazú Salinas D, Cabello Laureano R, et al. Protocolo antibiótico “fast-track” en la appendicitis aguda. *Cir Pediatr*. 2009;22:142-4.
- Andersson RE. The role of antibiotic therapy in the management of acute appendicitis. *Curr Infect Dis Rep*. 2013;15:10-3.

18. Wang X, Zhang W, Yang X, Shao J, Zhou X, Yuan J. Complicated appendicitis in children: is laparoscopic appendectomy appropriate? A comparative study with the open appendectomy - our experience. *J Pediatr Surg.* 2009;44: 1924-7.
19. Chang YJ, Chao HC, Chen CL, Chen SY, Yan DC, Tsai MH. C-reactive protein may predict the recurrence of appendicitis in children formerly with appendiceal mass after successful non-operative treatment. *Pediatr Neonatol.* 2016 pii: S1875-9572(16)30376-X.
20. Xu J, Adams S, Liu YC, Karpelowsky J. Nonoperative management in children with early acute appendicitis: a systematic review. *J Pediatr Surg.* 2017. pii: S0022-3468(17) 30268-3.