

Letters to the Editor

Controversial aspects in the management of perforated appendicitis in children

Sir,

Acute appendicitis remains the most common condition requiring emergency abdominal operation in the pediatric age group. There is now a general consensus regarding the management of simple acute appendicitis. This, however, is not the case for perforated appendicitis where controversies concerning duration of antibiotics therapy, skin closure, and the use of drains still continues.^{1,2,3} In this report, we analyze our results in the management of 60 consecutive children with perforated appendicitis and address 2 of the controversial issues in the management of perforated appendicitis in children.

The medical records of 60 consecutive children with perforated appendicitis, treated over a 3-year period between January 1998 and February 2001 at Qatif Central Hospital, Kingdom of Saudi Arabia were retrospectively studied. All underwent a standardized method of treatment apart from the antibiotic choice, which was left to the treating physician. The treatment protocol consisted of 1. Emergency appendectomy through a right transverse lower abdominal, muscle splitting incision, 2. Intra-operative irrigation of the peritoneal cavity with normal saline, 3. Pre and postoperative antibiotics, 4. No drains and 5. Primary wound closure. The operative evidence of perforation, the presence of free pus or an abscess cavity defined a perforated appendix, or histological evidence of perforated appendicitis. Postoperative wound infection was defined as discharge of pus or a positive culture from the wound. There were 34 males and 26 females. Their ages ranged for 1.5 years - 12 years (mean 8.2 years). All presented with abdominal pain, 54 (90%) had vomiting, 43 (71.7%) were febrile and 9 (15%) had diarrhea. The duration of symptoms was variable ranging from 8 hours - 5 days (mean 40.2 hours). All received antibiotics, and the majority, 53 (88.3%) received triple antibiotics (Ampicillin, Flagyl and Gentamycin). Four patients received Flagyl only, 2 patients received Cephalosporin only, and one patient received Flagyl and a Cephalosporin. The duration of antibiotics was variable ranging from 3 days to 9 days (mean 4.6 days). All the wounds were closed primarily, interrupted in 49 (81.7%) and subcuticular in 11 (18.3%). There was no mortality, and post operatively 4 (6.7%) patients developed complications. Two patients (3.3%) developed wound infection, one (1.7%) developed a pelvic

abscess and one (1.7%) developed adhesive intestinal obstruction. The hospital stay ranged from 3 days - 10 days (mean 5.5) days.

In 1901, Ochsner reviewed 565 cases of appendicitis and reported a mortality rate of 55.5% for 18 patients with diffuse peritonitis, 5% for 197 patients with gangrenous or perforated appendicitis, and 0.3% for 368 patients with simple acute appendicitis.⁴ Fortunately this is not the case now where the recent series of complicated appendicitis in children reported no mortality and wound infection rates between 0% and 3.4% and intra-abdominal abscess rates between 1.1% and 2.5%.^{1,2,5-7} The introduction of antibiotics in the management of perforated appendicitis in children has definitely contributed to a decrease in both wound infection rate as well as intra-abdominal abscess. Although, there is now general consensus on the value of routine use of parental antibiotics for perforated appendicitis, the duration of antibiotics used is still controversial. The specific antibiotics to be used may be variable but the majority advocate triple antibiotics (Ampicillin, Gentamycin and Clindamycin).^{2,3} In our study the majority of our patients (88.3%) received triple antibiotics (Ampicillin, Gentamycin and Flagyl). The duration of antibiotics cover is still, however controversial. The majority of studies advocate the use of triple antibiotics and for more than 7 days. The question is whether this is necessary and if antibiotics against gram negative and anaerobes only are sufficient.¹ The fact that antibiotics are to be used for more than 7 days will result in a prolonged hospital stay and decrease in cost. In our study the average duration of antibiotics was 4.6 days (3-9 days). Our study, however, is a retrospective one, and we feel that further prospective studies are required to clarify this issue. The use of drains in the management of perforated appendicitis is still controversial, and several studies showed good results with^{1,3} or without drains.^{2,5,6,7} In our study, none of our patients were treated with transperitoneal drainage, and only 2 (3.3%) developed wound infection, and one (1.7%) developed a pelvic abscess. A comparison of our results to the recently published international series is shown in **Table 1**. We like others feel that transperitoneal drains are not be used in the management of all patients with perforated appendicitis and should be reserved only for those with retrocecal abscess that cannot be properly debrided.² In fact the use of drains may delay discharge, prolong the hospital stay and increase cost. The 2nd controversial point in the management of perforated appendicitis is whether the wound should be left open or primarily closed. Neilson et al,²

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Table 1 - Comparison of recent series of perforated appendicitis in the pediatric age group.

Study	N of patients	Peritoneal Drain	Wound Closure	Hospital stay (Days)	Wound Infection (%)	Abdominal abscess (%)
Curran & Muenchow ¹	167	Yes	Primary	8.7	0	3
Schwartz ³	143	Yes	Primary	12.1	1.4	0
Neilson et al ²	117	No	Primary	6.9	1.7	1.7
Karp et al ⁵	88	No	Primary	11.3	3.4	1.1
Elmore et al ⁶	102	No	Open	8	0	1.3
Samelson & Reyes ⁷	170	No	Open	11.8	2.4	1.8
Mackellar & Mackay ⁸	139	No	Primary	-	1.4	1.4
Present Series	60	No	Primary	5.5	3.3	1.7

Schwartz et al³ and Karp et al⁵ reported 1.7%, 1.4% and 3.4% wound infection rates following appendectomy for perforated appendicitis.^{2,3,5} Leaving the wound open means daily dressing which may not be acceptable to a child, will require delayed wound closure and will increase the duration of hospitalization and cost.

In conclusion, we like others feel that with the proper use of antibiotics and measures to limit peritoneal contamination, appendectomy for perforated appendix can be performed safely in children with primary wound closure and without the need for transperitoneal drainage.

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