

APPENDICITIS

Appendicitis is the most common surgical condition of the abdomen in children over the age of 4 years and yet can be a challenge to diagnose and manage. Although diagnosis and treatment have improved over the years, it continues to cause considerable morbidity and even mortality in Malaysia. The deaths appear to be due to delay and difficulty in diagnosis, inadequate perioperative fluid replacement and sepsis.

Clinical Features

- *Abdominal pain* – Lower abdominal pain is an early and almost invariable feature. Usually the pain starts in the epigastrium or periumbilical region before localising to the lower abdomen or the right iliac fossa. However the younger child may not be able to localise the pain. If there is free pus, the pain is generalised.
- *Nausea and vomiting* occurs in about 90% of children and is an early symptom. Most children have a loss of appetite. A hungry child rarely has appendicitis.
- *Diarrhoea* is more common in the younger age group causing confusion with gastro enteritis. It can be due to pelvic appendicitis or collection of pus within the pelvis.
- *Dysuria and frequency* are also commonly present in the child with pelvic appendicitis or perforated appendicitis

Physical Findings

- *General* – the child is usually *quiet* and may be dehydrated.
- *Dehydration* must be actively sought for especially in the obese child and the child with perforated appendicitis. A history of vomiting, tachycardia, poor urine output and poor perfusion are indicators of dehydration.
- *Tenderness* on palpation or percussion is essential for the diagnosis. However it may be localised to the right iliac fossa or be generalised. The tenderness may also be mild initially and difficult to elicit in the obese child or if the appendix is retrocaecal. Rebound tenderness is usually not required to make the diagnosis and can cause unnecessary discomfort.
- *Guarding* signifies peritonitis but may be subtle especially if the child is toxic and very dehydrated.
- Rectal examination is only required if other diagnosis are suspected e.g. ovarian or adnexal pathology.

Investigations

- *Full blood count* – The total white blood cell count may be elevated but a normal count does not exclude appendicitis
- *Blood Urea and Serum Electrolytes* – The sodium level may be apparently normal if the child is dehydrated
- *Serum Amylase* – If pancreatitis cannot be ruled out
- *Ultrasound and CT scan* have been suggested to improve the diagnostic accuracy in doubtful cases. So in our setting the recommendation is that the children need to be assessed by a specialist preoperatively.

Complications

- *Perforation* can occur within 36 hours of the onset of symptoms. Perforation rate increases with the duration of symptoms and delayed presentation is an important factor in determining perforation rate.

Perforation rate: Adolescent age group - 30-40%

Younger child - up to about 70%.

However, "active observation" with adequate fluid resuscitation and preoperative antibiotics before embarking upon surgery has not shown an increase in morbidity or mortality. Delaying surgery for both perforated and non perforated appendicitis till the daytime did not significantly affect the perforation rate, complications or operating time.

- *Appendicular abscess*, mass and perforation may be treated with intravenous antibiotics to settle the inflammatory and infectious process. If the child settles, this can then be followed by an interval appendicectomy which needs to be done within 14 weeks of the original disease process as recurrent appendicitis has been reported between 10-46 %.

Management

- children with appendicitis (suspected or confirmed) should be reviewed by a specialist.
- dehydration should be actively looked for in a child with appendicitis especially if it is advanced and if they have a history of vomiting and diarrhoea. The heart rate, perfusion and the urine output should be closely monitored. The blood pressure is usually maintained in the children until they have decompensated.
- rehydration must be aggressive using 20 mls/kg boluses of normal saline or Hartmann's solution given fast up to over 2 hours. The child should be reviewed after each bolus and the rehydration continued until the child's heart rate, perfusion and urine output and electrolytes are within normal limits. Maintenance fluid – ½ saline + 5% D/W
- antibiotics must be started soon after the diagnosis is made.
- inotropes may need to be started early if the child is in severe sepsis
- there is no rush to go to take the child to the operating theatre and it is recommended that appendicectomies not be performed after 11 pm especially in the sick child. However, the time should be utilised to continue the resuscitation and antibiotics with close monitoring of the child.
- at surgery, a thorough peritoneal washout with copious amount of normal saline is done after the appendicectomy. No drains are required and the skin can be closed with a subcuticular suture.