ejpmr, 2015,2(4), 136-142

SJIF Impact Factor 2.026

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 3294-3211

EJPMR

LITERATURE REVIEW ON APPENDICITIS WITH SPECIAL REFERENCE TO DIAGNOSIS AND EARLY TREATMENT: A REVIEW

[1*]Dr. Rajesh Gouri and [2]Dr. Mayur Parmar

[1]Assistant Professor, Department of Surgery, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat.

[2]Senior Lecturer, Goenka Research Institute of Dental Science, Gandhinagar, Gujarat.

Article Received on 18/06/2015 **Article Revised on 12/07/2015** **Article Accepted on 04/08/2015**

***Correspondence for Author**

Dr. Rajesh Gouri

Assistant Professor, Department of Surgery, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat.

ABSTRACT

The appendix is a thin tail, tube or appendage growing out of the caecum, which is part of the large intestine located on the lower right side of the abdomen. The diagnosis and treatment of acute appendicitis are described with emphasis on the significance of ultrasonography, computed tomography (CT), and laparoscopic appendectomy. The diagnosis of acute appendicitis has traditionally been made by physical examination and blood tests. Appendectomy for appendicitis is the most commonly performed emergency operation in the world. Antibiotic prophylaxis is effective in the prevention of postoperative wound infection and intra-abdominal abscess. Antibiotic coverage is limited to 24 to 48 hours in cases of non-perforated appendicitis. For perforated appendicitis, 7 to 10 days of treatment is recommended. Compared with younger patients, elderly patients with appendicitis often pose a more difficult diagnostic problem because of the atypical presentation, expanded differential diagnosis, and communication difficulty. These factors contribute to the disproportionately high perforation rate seen in the elderly.

KEYWORDS: Appendix, Appendectomy, caecum, prevention.

INTRODUCTION

The appendix is a thin tail, tube or appendage growing out of the caecum, which is part of the large intestine located on the lower right side of the abdomen. The precise function of the

appendix in the human body is something of a mystery, although it clearly plays a role in digestion for other animal species. Appendicitis means inflammation of the appendix. Food or faecal matter can sometimes lodge in the narrow tube of the appendix, and the blockage becomes infected with bacteria.[1]

Acute appendicitis is one of the most common conditions treated by emergency operation. Physicians from a wide range of medical specialties including internal medicine and pediatrics, as well as surgeons, encounter patients with this condition in their daily practice. Symptoms of appendicitis overlap with a number of other conditions making diagnosis a challenge, particularly at an early stage of presentation.[2] Patients may be suitably triaged into alternative management strategies: reassurance, pursuit of an alternative diagnosis or observation/admission to hospital. If admitted to hospital, appropriate imaging may be required prior to proceeding to an appendectomy.[3]

Historical Background

Although ancient texts have scattered descriptions of surgery being undertaken for ailments sounding like appendicitis, credit for performing the first appendectomy goes to Claudius Amyand, a surgeon at St. George's Hospital in London and Sergeant Surgeon to Queen Ann, King George I, and King George II. In 1736, he operated on an 11-year-old boy with a scrotal hernia and a fecal fistula. Within the hernial sac, Amyand found the appendix perforated by a pin. He successfully removed the appendix and repaired the hernia.

The appendix was not identified as an organ capable of causing disease until the nineteenth century. In 1824, Louyer-Villermay presented a paper before the Royal Academy of Medicine in Paris. He reported on two autopsy cases of appendicitis and emphasized the importance of the condition. In 1827, François Melier, a French physician, expounded on Louyer-Villermay's work. He reported six autopsy cases and was the first to suggest the antemortem recognition of appendicitis.[4] This work was discounted by many physicians of the era, including Baron Guillaume Dupuytren. Dupuytren believed that inflammation of the cecum was the main cause of pathology of the right lower quadrant. The term typhlitis or perityphlitis was used to describe right lower quadrant inflammation.

In 1839, a textbook authored by Bright and Addison entitled Elements of Practical Medicine described the symptoms of appendicitis and identified the primary cause of inflammatory processes of the right lower quadrant.[5] Reginald Fitz, a professor of pathologic anatomy at

Harvard, is credited with coining the term appendicitis. His landmark paper definitively identified the appendix as the primary cause of right lower quadrant inflammation.[6]

Initial surgical therapy for appendicitis was primarily designed to drain right lower quadrant abscesses that occurred secondary to appendiceal perforation. It appears that the first surgical treatment for appendicitis or perityphlitis without abscess was carried out by Hancock in 1848. The greatest contributor to the advancement in the treatment of appendicitis was Charles McBurney. In 1889, he published his landmark paper in the New York State Medical Journal describing the indications for early laparotomy for the treatment of appendicitis.

The surgical treatment of appendicitis is one of the great public health advances of the last 150 years. Appendectomy for appendicitis is the most commonly performed emergency operation in the world. Appendicitis is a disease of the young, with 40% of cases occurring in patients between the ages of 10 and 29 years.[7] In 1886, Fitz reported the associated mortality rate of appendicitis to be at least 67% without surgical therapy.7 Currently, the mortality rate for acute appendicitis with treatment is reported to be <1%.[8]

Etiology and Pathogenesis

Obstruction of the lumen is the dominant etiologic factor in acute appendicitis. Fecaliths are the most common cause of appendiceal obstruction. Less common causes are hypertrophy of lymphoid tissue, inspissated barium from previous x-ray studies, tumors, vegetable and fruit seeds, and intestinal parasites. The frequency of obstruction rises with the severity of the inflammatory process. Fecaliths are found in 40% of cases of simple acute appendicitis, in 65% of cases of gangrenous appendicitis without rupture, and in nearly 90% of cases of gangrenous appendicitis with rupture.

The proximal obstruction of the appendiceal lumen produces a closed-loop obstruction, and continuing normal secretion by the appendiceal mucosa rapidly produces distention. The luminal capacity of the normal appendix is only 0.1 mL. Secretion of as little as 0.5 mL of fluid distal to an obstruction raises the intraluminal pressure to 60 cm H2O. Distention of the appendix stimulates the nerve endings of visceral afferent stretch fibers, producing vague, dull, diffuse pain in the midabdomen or lower epigastrium.

Peristalsis also is stimulated by the rather sudden distention, so that some cramping may be superimposed on the visceral pain early in the course of appendicitis. Distention increases

from continued mucosal secretion and from rapid multiplication of the resident bacteria of the appendix. Distention of this magnitude usually causes reflex nausea and vomiting, and the diffuse visceral pain becomes more severe. As pressure in the organ increases, venous pressure is exceeded. Capillaries and venules are occluded, but arteriolar inflow continues, resulting in engorgement and vascular congestion. The inflammatory process soon involves the serosa of the appendix and in turn parietal peritoneum in the region, which produces the characteristic shift in pain to the right lower quadrant. The mucosa of the GI tract, including the appendix, is susceptible to impairment of blood supply; thus its integrity is compromised early in the process, which allows bacterial invasion. As progressive distention encroaches on first the venous return and subsequently the arteriolar inflow, the area with the poorest blood supply suffers most: ellipsoidal infarcts develop in the antimesenteric border. As distention, bacterial invasion, compromise of vascular supply, and infarction progress, perforation occurs, usually through one of the infarcted areas on the antimesenteric border. Perforation generally occurs just beyond the point of obstruction rather than at the tip because of the effect of diameter on intraluminal tension.[9]

Diagnosis of Acute Appendicitis[10]

1. Clinical manifestations

Abdominal pain, fever, and anorexia are classical symptoms. Pain occurs in the upper abdomen at first. It then moves slowly and localizes to the right lower quadrant. In many cases, a fever of around 38°C is present.

2. Findings on physical examination

Physical examination is the most useful method for diagnosing appendicitis and for determining whether an operation is necessary. Tenderness can be elicited at various points in the right lower quadrant of the abdomen, including McBurney's, Lanz's, and Munro's points (Fig. 1). Among the indications for surgical treatment, the presence of peritoneal irritation is critical. Operation is indicated when Blumberg's sign is positive (the pain elicited by steadily increasing pressure at the site of tenderness increases on abrupt release of the pressure), and when Rosenstein's sign is elicited (tenderness in the right lower quadrant increases when the patient moves from the supine position to a recumbent posture on the left side). As a matter of course, the detection of abdominal muscular guarding and tenderness on rectal examination are among the surgical indications.

3. Laboratory tests

The white blood cell count (WBC) and CRP are of diagnostic value. The WBC usually exceeds 10,000/mm3. In severe cases associated with diffuse peritonitis, however, the WBC may be decreased rather than increased, so care must be taken. Although the CRP rises in appendicitis, the increase is not necessarily associated with the severity of inflammation.

4. Imaging diagnosis

Plain abdominal radiographs show no particular evidence of appendicitis. If an air-fluid level is seen in the lower abdomen, however, localized peritonitis should be suspected. Ultrasonography and CT scanning are of diagnostic value, and provide useful information for determining whether or not appendectomy is necessary.

Treatment for appendicitis

Treatment includes an operation to remove the appendix completely. This procedure is known as an appendicectomy or appendectomy. The appendix can often be removed using laparoscopic (keyhole) surgery. The surgeon will use a slender instrument (laparoscope), which is inserted through tiny incisions (cuts) in the abdomen. This eliminates the need for an abdominal incision. If this is not possible, a small incision is made in the lower abdomen. The appendix is cut away and the wound on the large intestine stitched. If the appendix has burst, the surgeon will insert a tube and drain the abdominal cavity of pus. Antibiotics are given to the patient intravenously to reduce the possibility of peritonitis. The typical hospital stay for an appendicectomy is between three and five days. Removing the appendix appears to have no effect on the workings of the digestive system, in either the short or long term. An alternative to surgery is antibiotic therapy. Studies that have compared the outcome of surgery to the outcome of antibiotics show that about 70 per cent of cases may resolve with antibiotic therapy and not require surgery. However, the factors leading to failure of antibiotic therapy are not known, so antibiotic therapy alone is usually reserved for patients too frail to undergo surgery.[1]

Complications

Appendicectomy is a relatively safe procedure with a mortality rate for non-perforated appendicitis of 0.8 per 1000.[11] The mortality and morbidity are related to the stage of disease and increase in cases of perforation; mortality after perforation is 5.1 per 1000.[11] According to a large historical cohort study, a perforated appendix during childhood does not seem to have a long term detrimental effect on subsequent female fertility.[12]

Wound infection

The rate of postoperative wound infection is determined by the intraoperative wound contamination. Rates of infection vary from < 5% in simple appendicitis to 20% in cases with perforation and gangrene.

Intra-abdominal abscess

Intra-abdominal or pelvic abscesses may form in the postoperative period after gross contamination of the peritoneal cavity. The patient presents with swinging pyrexia, and the diagnosis can be confirmed by ultrasonography or computed tomography scanning.

Inflammatory bowel disease

A history of appendicectomy is associated with delayed onset of disease and a less severe disease phenotype in patients with ulcerative colitis.[13]

Appendix mass

In patients with a delayed presentation, a tender mass with overlying muscle rigidity may be felt in the right iliac fossa. The presence of a mass may be confirmed on ultrasonography or computed tomography scan; underlying neoplasia must be excluded, especially in elderly people.

Appendix abscess

Patients with an appendix abscess have a tender mass with a swinging pyrexia, tachycardia, and leucocytosis. The abscess is most often located in the lateral aspect of the right iliac fossa but may be pelvic; a rectal examination is useful to identify a pelvic collection.

Chronic (recurrent) appendicitis

Recently, with the advent of neurogastroenterology, the concept of neuroimmune appendicitis has evolved. After a previous minor bout of intestinal inflammation, subtle alterations in enteric neurotransmitters are seen, which may result in altered visceral perception from the gut; this process has been implicated in a wide range of gastrointestinal conditions.[12]

CONCLUSION

The diagnosis and management of acute appendicitis have been described with a focus on some current issues. For diagnosis, findings on ultrasonography and CT are important. For management, laparoscopic appendectomy should be considered as a possible choice if there are indications for this procedure.

REFERENCES

1. Appendicitis. Available at www.betterhealth.vic.gov.au accessed on 14/08/14.
2. Bundy DG, Byerley JS, Liles EA, Perrin EM, Katznelson J, Rice HE: Does this child have appendicitis? JAMA., 2007; 298: 438-451.
3. Paulson EK, Kalady MF, Pappas TN: Clinical practice. Suspected appendicitis. N Engl J Med., 2003; 348: 236-242.
4. Ellis H. Appendix, in Schwartz Si (ed). Maingot's abdominal operations, 8th ed, vol 2. Norwalk, Conn: Appleton-Century-Crofts, 1985; 1255.
5. Lewis F. Appendix, In Davis JH (ed): Clinical Surgery, 1st ed, Vol 1. St Louis, Mo, Mosby, 1987; 1581.
6. Fits RH: Perforating Inflammation of Vermiform Appendix: with special references to its early diagnosis and treatment. Trans Assoc Am Physicians., 1886; 1: 107.
7. Addidas DG, Shaffer N, Fowler Bs, et al: the epidemiology or appendicitis and appendectomy in the united states. Am J epidemiol, 1990.
8. Hally DA, Molloy M, Pearl RH, et al: Appendectomy: A contemporary appraisal. Ann Surg., 1997; 225: 252.
9. Seymour I Schwartz; F Charles Brunicardi; et al. Schwartz's principles of surgery.9th edition, new York. McGraw-Hill, Medical Pub. Division, 2010; 1-47.
10. Hiroshi ISHIKAWA. Diagnosis and Treatment of Acute Appendicitis., 2003; JMAJ 46(5): 217–221.
11. Blomqvist PG, Andersson RE, Granath F, Lambe MP, Ekbom AR. Mortality after appendectomy in Sweden, 1987-1996. *Ann Surg*, 2001; 233: 455- 60.
12. Andersson R, Lambe M, Bergstrom R. Fertility patterns after appendicectomy: historical cohort study. *BMJ.*, 1999; 318: 963-7.
13. Andersson RE, Olaison G, Tysk C, Ekbom A. Appendectomy and protection against ulcerative colitis. *N Engl J Med.*, 2001; 344: 808-14.