Histological changes in appendix tissues during Acute appendicitis

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Abstract

Appendicitis is an inflammation of the inner lining of the vermiform appendix spreads to the other parts. A total of twenty-three specimens from patients in surgery department in Tikrit Teaching Hospital were collected during the period from first January –end of February 2003 (16 male and 7 female ) age ranged from 5-15 years. The presence of extra vascular polymorphs in the epithelium, lamina propria, and muscular layers was the main diagnostic feature of the acute inflammation. Mucosa was largely destroyed with an extensive neutrophil infiltrate extending throughout the submucosa and into the muscularis externa. This was seen in all the specimens. This paper was designed to study the changes that occur in the appendix’s tissues as a result to acute appendicitis.

Introduction

Appendix is a worm like extension of the cecum and, for this reason, has been called the vermiform appendix. Its mean length is 8-10 cm (ranging from 2-20 cm). This organ appears during the fifth month of gestation, with several lymphoid follicles scattered in its mucosa. Such follicles increase in number during the age of 8-20 years.

Appendicitis is a of the more common surgical emergencies, and it is one of the most common causes of abdominal pain. The function of the human appendix remains obscure. However, appendicitis continues to challenge us, with (6-20)% of the general population developing appendicitis during their lifetime and about 1 in every 6 people undergoing appendectomy(1). Simple appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality, and surgeons have therefore been inclined to operate when the diagnosis is probable rather than wait until it is certain(1). The exact etiology and pathogenesis of appendicitis are poorly understood. Although obstruction of the lumen, which results in distension and interference with circulation, has been suggested to be a major factor, invasion of the appendix wall by micro organisms is considered to be the last event in the pathogenesis of acute appendicitis(2). Appendicitis occurs more frequently in males than in females, with a ratio of 1.7:1. Despite the fact that acute appendicitis is the most common surgical emergency, it continues to be a challenging disease(1,2).

The practice of early appendectomy for clinically suspected appendicitis has resulted in decreased morbidity, but both surgeons and pathologists are aware that a significant proportion of the removed appendices show no evidence of inflammation. This discrepancy between clinical presentation and the lack of definite morphologic changes is confounding. Some recent studies have suggested that there is an inflammatory basis to the presenting symptoms in some of these patients(3). This article was designed to study the histological and histopathological changes occur in appendix tissues during acute appendicitis.

Patients and Methods

Twenty-three speciments from patients in surgery department in Tikrit Teaching Hospital during the period from first January –end of February 2003 were included in this study (16 male and 7 from female ,age ranged 5-15 years). Gangrenous and perforated appendices were not included in this study, because of major structural damage of the lamina propria and submucosal tissue which made the demomfrafion impractical. consecutive
patients with a clinical diagnosis of appendicitis underwent emergency appendectomy at Tikrit Teaching Hospital. Appendix specimens obtained at surgery were fixed in formalin, divided into 3 segments from tip, central area and base, then embedded in paraffin. The twenty-three appendixes were sections randomly. Sections were cut at 5 cm and stained with routine hematoxylin and eosin stain.

Results

The presence of extravascular polymorphs in the epithelium, lamina propria, or muscular layers was the main diagnostic feature of acute inflammation. The wall of appendix was clearly visible and the mucosa was largely destroyed, and there was extensive neutrophil infiltrate extending throughout the submucosa and into the muscularis externa. This was seen in all specimens.

The ganglia appeared to be more prominent, and found not only between the circular and longitudinal muscle layers but also deep within the muscle layers as illustrated by (Fig. 1).

A large number of nerve fibers and Schwann cells were observed widely distributed throughout the submucosa and the muscularis externa, especially in the circular muscle layers. The number and size of ganglia in the muscularis externa and the submucosa were significantly greater than in the control. Fig. (3) show that there was an extensive neutrophil infiltration extending throughout the submucosa into the muscularis externa.

The smooth muscle fiber, seen as separated muscle bundles by inflammatory exudates. This exudates consist large number of polymorph cells with other inflammatory cells.

Furthermore, the glands of appendix was largely affected, and shows the mucosa glands was destroyed and pus present at the base of the gland and with only few remnant of glands in the section.

Discussion

The appendix is a wormlike extension of the cecum, and its average length is 8-10 cm (ranging from 2-20 cm). This organ appears during the fifth month of gestation, and its wall has an inner mucosal layer, 2 muscular layers, and a serosa. Several lymphoid follicles are scattered in its mucosa.

Acute appendicitis is still common in Europe and the USA but uncommon in many other parts of the world, probably for reasons of diet. The acute inflammatory process tends to spread along the muscular and serous coats, particularly if the lumen is obstructed. It may also spread to the peritoneal surface, and form fibrinous adhesions which enclose the appendix in a cavity, along with bacteria and many polymorph leukocytes.

The study has shown that there was an extensive infiltration of inflammatory cells in the mucosa and submucosa layers of all specimens. Moreover, there was an increase in the numbers of nerve fibers, Schwann cells, ganglia, and mast cells in.

In rodents, excision of the appendix in the neonatal period results in disruption of normal patterns of B-cell seeding throughout the intestinal mucosa with subsequent declines in the frequency of immunoglobulin (Ig)A-producing plasma cells and luminal IgA secretion. Further, excision of the appendix in early life modulates experimental colitis in T-cell receptor-alpha; null mice, which develop a pattern of intestinal inflammation and autoreactive antibodies similar to ulcerative colitis.

Peripheral nerve tissue under physiological conditions is generally considered to be stable with regard to proliferation and regeneration. Although increased neuronal components and peptidergic neurotransmitters have been reported in association with inflammatory bowel diseases such as ulcerative colitis and Crohn disease, there are no reports of altered neural expression in association with acute inflammatory conditions.

References

6. Curran R. and Crocker J. Curran's atlas of histopathology. 4th edn. Harvey Miller Pub,2000. mucosa was largely destroyed and there was extensive neutrophil infiltrate extending throughout the submucosa and into the muscularis externa, this finding was seen in all specimens.