Epidemiological and Histopathological Study of Appendicitis in Karbala Province

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Abstract

The current study included an epidemiological prevalence study of appendicitis in Karbala province, where complete data were collected for the year 2018 from Al Hussein medical Hospital. The results showed that the total number of appendicitis in Karbala province was (636) cases , divided in to (299) and (286) for male and female respectively, while the secondary removal cases was (69). The percentage of infection was 47.012%, 42.12% and 10.85% for male , female and secondary removal. The statistical analysis showed that there were significant differences under (P> 0.05) between percentage of infection in male and female (0.01). Also this study included histopathological examination of appendectomy specimen. After surgical removal of appendix, the specimen directly fixed with 10% formalin and then do tissue processing. The microscopic examination showed obstruction of the lumen and infiltration of inflammatory cell within lumina properia, muscularis and adventatia.the mucosal epithelial was destruction with ulceration, also there are extensive lymphoid hyperplasia.

Keywords*: appendicitis , prevalence, Karbala, gender, histopathological.*

Introduction

Appendicitis is inflammation of the vermiform appendix, this is a hollow organ located at the tip of the Cecum, usually in the right lower quadrant of the abdomen, however it can be located in almost any area of the abdomen depending on if there were any abnormal developmental issues (situs inversus totalis) or if there are any other concomitant conditions such as pregnancy or prior surgeries [(1).]

The appendix develops embryonically at the fifth week, during this time there is a movement of the midgut to the external umbilical cord with the eventual return to the abdomen and rotation of the Cecum, this results in the usual retrocecal location of the appendix [(2)].

Appendicitis is more common surgical emergencies, and it is one of the most common causes of abdominal pain [(3)] . The exact function of the appendix has been a debated topic, today it is accepted that this organ may have an immunoprotective function and acts as a lymphoid organ especially in the younger person, other theories contend that the appendix acts as a storage vessel for "good" colonic bacteria, still others argue that it is a mear developmental remnant and has no real function [(4)] .

Appendicitis is most common between the ages of 5 and 40 ,the median age is 28, risk factors include being male, higher household income and living in a rural area [(5)] .

In the United States, there were nearly 293,000 hospitalizations involving appendicitis in 2010 . Appendicitis is one of the most frequent diagnoses for emergency department visits resulting in hospitalization among children ages 5–17 years in the United States [(6)] .

Research aims:

1-study the epidemiological prevalence of appendicitis in karbala province.

2-study the histopathological changes occur in appendix tissues during acute appendicitis .

Research methodology and procedures:

A database of patients with appendicitis was collected from Al Hussein medical city in the Karbala city from January to December 2018. Also, samples were taken from the surgical theaters after being fixed directly with 10% formalin for tissue processing.

Results

1- Epidemiological study

All samples that collected in this study were under different condition, like; gender and age. The total number of appendicitis that show in this study in Karbala province was (636) cases divided in to (299 and (268) for male and female respectively, while the secondary removal cases was (69). The percentage of infection was 47.012%, 42.12% and 10.85% for male , female and secondary removal. The statistical analysis showed that there were significant differences under (P> 0.05) between percentage of infection in male and female (0.01). Table (1).

Table (1): Percentage of appendicitis according to gender:

Gender	Cases number	Percentage (%)
Male	299	47.012%
Female	268	42.12%
Secondary removal	69	10.85%
Total	636	100%
Chi-Square P-value	----	9.261 ** 0.0001
		** (P<0.01).

This study also show that the highly percentage of infection in both male and female was in age between 10-20 years (35,82% in female and 42,47% in male) , while the low percentage was in age between 60-70 years (1,11% in female and 0,66% in male) Table (2) and Table (3)

Table (2): percentage of appendicitis according to Female age:

Age / female	Cases number	Percentage (%)
$\geq 10\ year$	32	11,94%
$< 10 \geq 20\ year$	96	35,82%
$< 20 \geq 30\ year$	81	30,22%
$< 30 \geq 40\ year$	40	14,92%
$< 40 \geq 50\ year$	9	3,35%
$< 50 \geq 60\ year$	7	2,61%
$< 60 \geq 70\ year$	3	1,11%
Total	268	100%
Chi-Square P-value	--- 	10.026 ** 0.0001
** (P<0.01).		

Table (3): percentage of appendicitis according to Male age:

Age / Male	Cases number	Percentage (%)
$\geq 10\ year$	32	10,7%
$< 10 \geq 20\ year$	127	42,47%
$< 20 \geq 30\ year$	90	30,10%
$< 30 \geq 40\ year$	37	12,37%
$< 40 \geq 50\ year$	7	2,34%
$< 50 \geq 60\ year$	4	1,33%
$< 60 \geq 70\ year$	2	0,66%
Total	299	100%
Chi-Square P-value	---	10.934 ** 0.0001
** (P<0.01).		

2- Histopathological study:

In present study the histopathological changes observed in appendix were presence of extravascular polymorphs in the epithelium, lamina propria, or muscular layers was the main diagnostic feature of acute inflammation (Figure 1 B, C, D). The wall of appendix, was clearly visible and the mucosa was largely destroyed (figure 1(A, and D)), and there was extensive neutrophil infiltrate extending throughout the submucosa and into the muscularis externa. The was seen in all specimens. 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 (Fig.21 B.

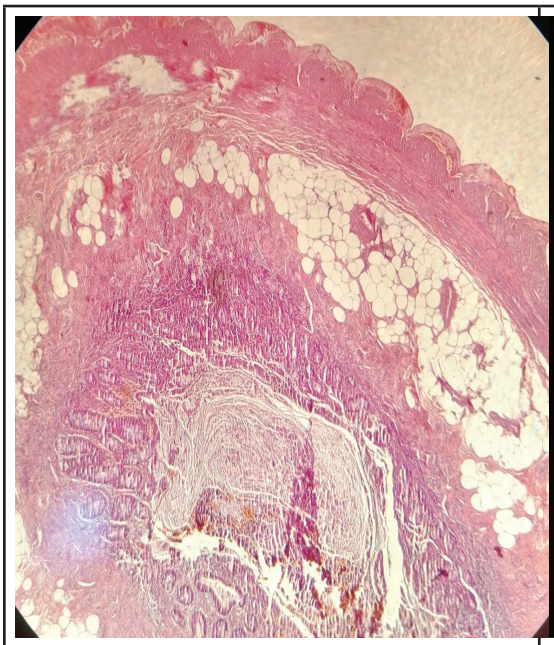

Figure (1) A:show lumen obstruction and mucosa destruction of appendix.

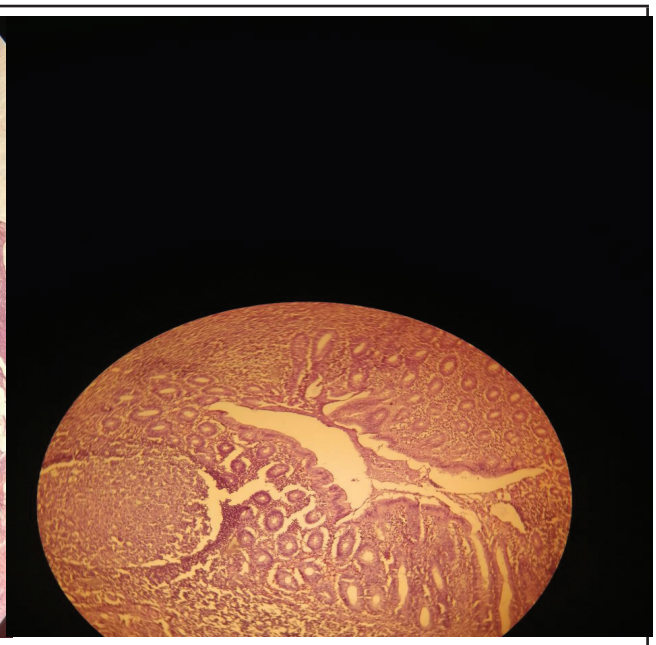

Figure (1) B: Show the lymphoid hyperplasia

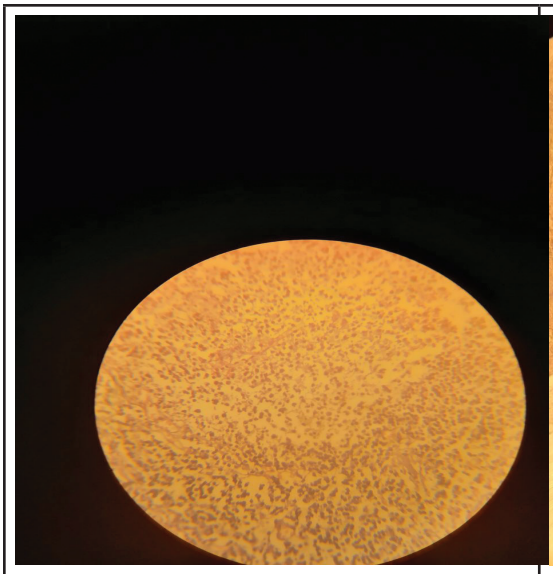

Figure (1) C:show infiltration of white blood cell (neutrophils).

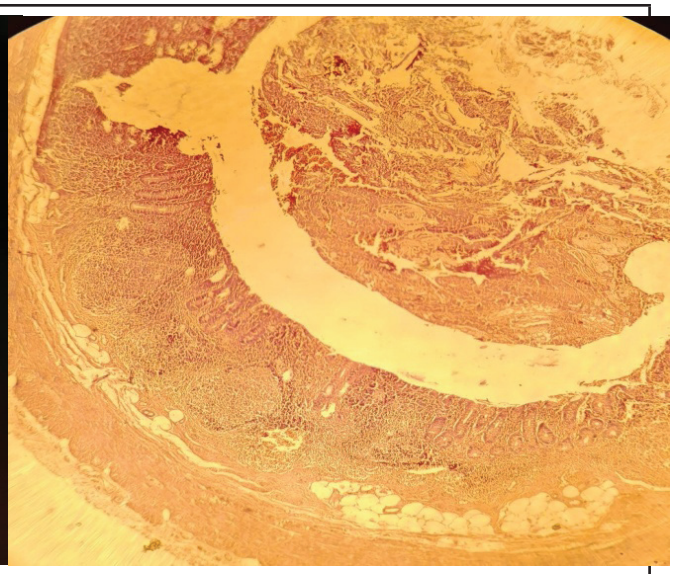

Figure (1) D:show obstruction of the lumen and infiltration of inflammatory cell within lumina properia , muscularis and adventatia

Discussion of Results

Our study was revealed increase incidence of appendicitis between males compare with females, that may be related with female sex hormones , which has been proposed because of lower incidence among women and incidence variations during the menstrual cycle [7] .

Anderson was found inverse relation between pregnancy and appendicitis, this suggests that pregnancy protects against appendicitis, especially in the third trimester. During pregnancy a range of physiological changes take place that may influence the pathogenesis of appendicitis [8]. Our finding was agree with [9] . who reported increase of incidence of appendicitis in males, this due to variation in body physiology between male to female.

In our study the highly percentage of infection is rang between age (10-20) years, that cited by [10]. who reported that incidence of appendicitis is generally a disease of young age. [11] was reported in his study the incidence outcome of appendicitis are related to age in young people. It has been suggested that the peak in the development of lymphoid tissue which occurs during adolescence leads to an increased liability of the appendix to obstruct, and so accounts for the high incidence of the disease.

the present histopathological study showed lymphoid hyperplasia with increase in lymph nodules diameter, these lead to obstruction. Our study was revealed increase in wall thickness of appendix and narrow lumen , with increase infiltration of white blood cells was very visible . this finding agree with [12] and [13] they recorded infiltrate of neutrophile in the muscularis mucosa and sub mucosa.

Obstruction of the appendiceal lumen seems to be essential for development of appendiceal infection. This obstruction occurs due to mucosal inflammation and lymphoid hyperplasia, once obstruction occurs, continued mucus secretion and increase intraluminal pressure, which obstructs lymphatic drainage and edema, mucosal ulceration and may cause venous obstruction, finally ischaemic necrosis of appendix wall produces gangrenous appendicitis.

Conclusions

1- Appendicitis is one of emergency disease.

2-The total cases in Karbala province was 636 in 2018 year which is divided to (299) and (286) for male and female respectively, while the secondary removal cases was (69).

3- The percentage of infection in male is higher than in female 47.012%, 42.12% and 10.85% for male , female and secondary removal.

4- Highly percentage of infection in both male and female was in age between 10-20 years (35,82% in female and 42,47% in male) , while the low percentage was in age between 60-70 years (1,11% in female and 0,66% in male).

5- The most histopathological lesions that found in appendectomy specimence was lumen obstruction and mucosa destruction of appendix, lymphoid hyperplasia, obstruction of the lumen and infiltration of inflammatory cell within lumina properia , muscularis and adventatia.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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