Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i8.7454

HISTOPATHOLOGICAL FINDINGS FOR CLINICAL DIAGNOSIS IN TERTIARY CARE HOSPITAL OF PESHAWAR AND ABBOTTABAD

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ABSTRACT

Objectives : This study aims to determine the anatomical variation of appendix and its histopathological findings in specimen after appendectomy

Material and methods: This was a cross sectional study with 350 sample size and specimen was examined during appendectomy. After appendectomy the sample was sent to laboratory for histopathological findings.

Results: It was a cross sectional descriptive study done in tertiary care hospitals of Peshawar and Abbottabad KPK. The sample size was 350 and age was from 10 to 60 years, means age was 28.78 years. Among 350 sample size 60% were male while 40% were female living in rural area 39% and 60.7% were living in urban area. The age was divided into five intervals patients from 10-20 years were visiting to hospital for appendectomy were 31% , 21-30 years were 36% , 31-40 years were 13% , 41-50 years were 9.1% while 51-60 years were 9.7%. The variation found was retrocecal 65.8% while 21.7% was pelvic, postileal 2.8%, 7.1% subcecal and 2.6% preileal. Patient were mostly Pushto speakers 68.1%, while minority were 4.8% and urdu speakers were 26%. The histopathological profile was 28.5% chronic supurative appendicitis, 19.4% were fecolith, 15.1% lymphoid, appendicular mass 3.4%, chronic granulomatous inflammation was 3.4% acute gangrenous appendices was 6.8% while fibroid was 6.8% and unusual findings were 6% in the study.

Conclusion: The study concluded that retrocecal position was most common variation and acute supurative appendicitis is the common histopathological finding in appendix.

Keywords: variations, appendix, appendectomy, histopathology of appendix, demography.

INTRODUCTION

In the foundation of health sciences anatomical variations, structural abnormalities and microscopic structures play a vital role in surgical and medical disciplines. The change in normal patterns leads to anatomical variation and congenital or acquired abnormalities. It is reported in some of the studies that abdominal pain with a mortality rate of 6-7 % is acute appendicitis.1 The inflammation of the inner lining of the appendix is referred to as appendicitis. Acute appendicitis occurs in 6.7% of females and 8.6% of males from 10 to 20 years of age in the United States.2 In Pakistan, acute appendicitis is reported in the emergency department and appendectomy is the surgical procedure. The prevalence of appendicitis is 28.6% and is equal in males and females in Pakistan.3 Clinical features are pain in the lower right quadrant with abdominal rigidity and periumbilical pain and it radiates to the lower right quadrant. On examination, positive Rovsing sign and positive Obturator sign help to diagnose appendicitis. The etiology of appendicitis is still not clear up till now and is considered multifactorial which includes mechanical obstruction, smoking, decreased intake of fibers and familial.[3] In such conditions surgical appendectomy is the treatment, it can be open surgery or a laparoscopic procedure.2

The vermiform appendix is present 2 cm below the ileocecal junction at a posteromedial wall of the cecum. It is a narrow and long tube ranging from 1-25 cm in length[4] and supported with mesoappendix which is a double-layer fold of peritoneum and it suspends the organ from the terminal ileum. It is longer in males than females but there is variation in the length of the appendix. 5 Knowledge and understanding about the variations in the position of the appendix is important because the variable position or anatomic variations of the appendix produce different signs and symptoms which mimic other diseases. Therefore understanding the length of the appendix and variation in position plays a vital role in the differential diagnosis of acute abdomen.[6] Some of the variations of the appendix are retrocecal /retrocolic when the appendix is posterior-superior to the cecum, while pelvic is when the tip of the appendix is exceeding the upper edge of the pelvis. When the distal part of the appendix is postero-superior to the terminal ileum is Post-ileal and Subcecal is when the appendix is under the cecum resting on the right iliac fossa and separated from the iliac muscle. Pre-ileal is when the distal portion of the appendix is anterior-superior to the terminal ileum. The paracecal position is when the cecum and ascending colon is medial to the appendix. Other (ectopic) positions occur when the appendix does not fit in any of the above describe positions.[7] Position of the appendix, ethnicity and geographical variations may change the anatomy and cause challenges during appendectomy because it may require a change in surgical technique and it can affect the cosmetic outcome and prolong the surgery time.[8] Regardless of the increase in imaging techniques and advancements in technology, there is a problem in the diagnosis of acute appendicitis while the histopathological examination is still a gold standard for the confirmation of appendicitis. There is some evidence that intraoperative normal appendices may have abnormal findings at the cytology level in the specimen of appendectomy after sending for routine histopathological examination.[9] Less than 50% of appendiceal tumors are identified intraoperatively.[10] The mortality rate of non-perforated appendicitis is 0.8 per 1000 while mortality after perforation is 5.1 per 1000. Actually the morbidity and mortality are related to the stage of disease or increase number of cases of appendicitis.11 Now at present the rate of perforation is between 16% to 30% 12 but it is increased in older individuals and it would be upto 97% because of delayed diagnosis of appendicitis and increase rate of negative appendectomy that is from 20% to 25%. 11

There is still very fewer data or research about the appendix in KPK. Therefore, this study will aim to determine anatomical variation of appendix and its histopathological findings in specimen after appendectomy.

MATERIAL AND METHODS

It was a Cross sectional descriptive study with nonprobability convenience sampling. The sample size was 350 patients selected randomly from patient visiting to the lady reading hospital and Khyber teaching hospital Peshawar and Ayub teaching hospital Peshawar KPK. Research work was completed in 10 months after the approval of the research proposal from the ethical committee and

advanced study and research committee of Gandhara University Peshawar KPK Pakistan. The inclusion criteria was both genders (male and female) age from 10 to 60 years. The sample was taken after the ethical approval of synopsis that is GU/Ethical Committ/2022/171. Patient visiting the emergency surgical department for appendectomy. Exclusion criteria was pregnant patients, age more than 60 years and perforated appendix. Patient visiting or admitted to the emergency department of Ayub teaching hospital and other tertiary care hospitals of Peshawar were considered for sample collection. Patients visiting to the OPD were examined then investigations ware done and followed by diagnosis and confirmation of diagnosis that patient was suffering from appendicitis or not. Consent form was signed by the patient or attendant. The patient was prepared for the surgery after taking consent. Specimen was collected and send to the laboratory for further histopathological examination. **Procedure for histopathological examination** consists of removal of entire appendix after dividing the mesoappendix and ligating the base of the appendix. Start to measure the organ with scale. Divide the specimen in two section by taking cross-section 2cm from the tip. Take a sections at 5mm intervals from the tip by cut cross sections of the proximal fragments. Divide distal fragment into two by a longitudinal cut. **Proximal one third close to surgical margins:** one cross section. If tumor is present in the specimen paint the surgical margins with ink and take an additional section from the specimen. **Mid one third:** One cross sectional, **Distal one third:** One longitudinal section.

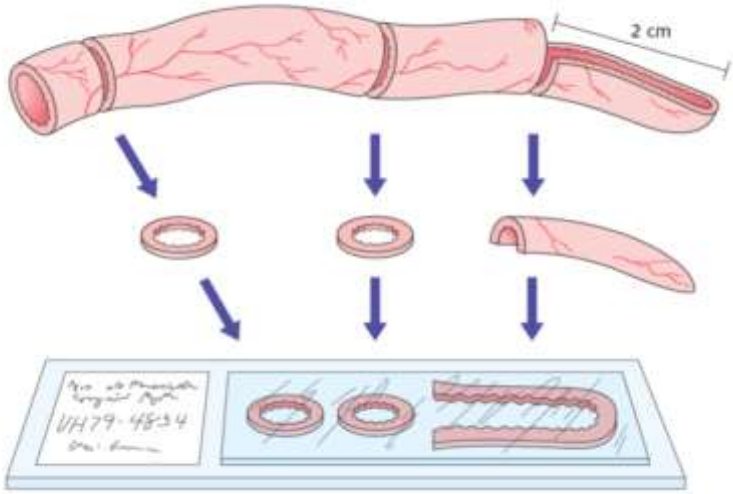

Figure 1: Shows cross section and longitudinal sections

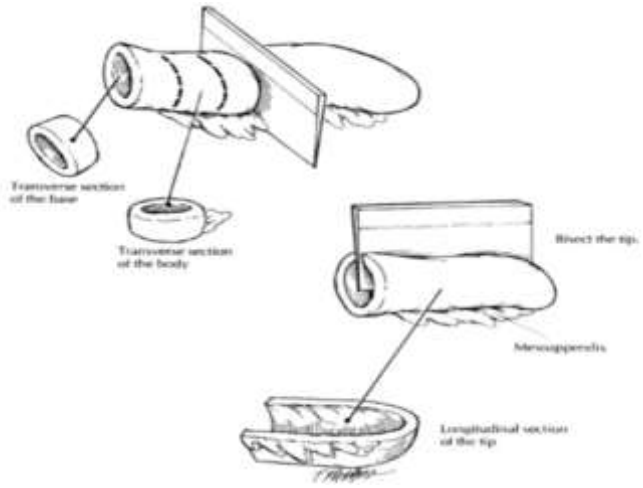

Figure 2: Shows cross section and longitudinal section wall and lumen of the appendix.

The external surface were found to be inflamed, adhered, and hyperemic or perforated. The mucosa of the appendix was hyperemic and ulcerative with some fecolith in it. The mean and standard

deviation of quantitative and qualitative variables were calculated in frequencies and percentages .The statistical relationship of parameters related to the appendix with anatomical variations, histological findings, age, gender and length was assessed by applying the chi-sq test. Data analysis was done through SPSS version 22.

RESULTS

It was a cross sectional descriptive study done in tertiary care hospitals of Peshawar and Abbottabad KPK. The sample size was 350 and age was from 10 to 60 years, means age was 28.78 years. The age was divided into five intervals patients from 10-20 years were visiting to hospital for appendectomy were 31% , 21-30 years were 36% , 31-40 years were 13% , 41—50 years were 9.1% while 51-60 years were 9.7%. There were 60% were male while 40% were female living rural area were 39% and 60.7% were living in urban areas. The most common variation found was retrocecal 65.8% while 21.7% was pelvic, postileal 2.8%, 7.1% subcecal and 2.6% preileal. Patient were mostly Pushto speakers 68.1%, while minority were 4.8% and urdu speakers were 26%. The histopathological profile was 28.5% acute appendicitis and supurative appendicitis was 19.4%. The fecolith was 15.1% lymphoid 10.3%, appendicular mass 3.4%, chronic granulomatous inflammation was 3.4% acute gangrenous appendices was 6.8% while fibroid was 6.8% and unusual findings were 6% in the study.

Table 1: Shows demographic profile of patients visiting to hospital fo**r appendectomy**

Age	**Frequency**	**Percentage**
10-20	110	31.3%
21-30	128	36.5%
31-40	46	13.1%
41-50	32	9.1%
51-60	34	9.7%
Total	350	99.7
Gender		
Male	209	60%
Female	141	40%
Total	350	100.0
Location		
Urban	213	60.7%
Rural	137	39.0%
Total	350	99.7
Ethnicity		
Urdu speaker	94	26.8%
Pashto speaker	239	68.1%
Minority	17	4.8%
Total	350	100.0

Table 2: Shows the location of the appendix with different variations

Variation of appendix	**Frequency**	**Percent**
Retrocecal	230	65.8%
Pelvic	76	21.7%
Postileal	10	2.8%
Subcecal	25	7.1%
Preileal	9	2.6%
Total	350	100.0

Table3: Shows gender with anatomical variations of appendix

						Total
Gender	Retrocecal	Pelvic	Postileal	Subcecal	Preileal	
Male	137(39.14%)	45(12.86%)	5(1.43%)	13(3.71%)	8(2.29%)	208(59.42%)
Female	93(26.57%)	31(8.86%)	5(1.43%)	12(3.42%)	1(0.28%)	142(40.57%)

Total	230(65.71%)	76(21.71%)	10(2.86%)	25(7.14%)	9(2.57%)	350(100%)

Table 4: Shows the frequency of appendicitis

Type of appendicitis	Frequency	Percent
Acute	315	89.7%
Chronic	35	10.0%
Total	350	100.0

Table 5: Shows the type of appendicitis among gender

	Type_of_appendicitis		
Gender	Acute	Chronic	Total
Male	187	21	208
Female	128	14	142
	315	35	350

Table 6: Shows histopathological profile of appendix after appendectomy

Histopathological profile of appendix	**Frequency**	**Percent**
Acute appendicitis	100	28.5%
Acute suppurative	68	19.4%
Fecolith	53	15.1%
Lymphoid	36	10.3%
Fibroid	24	6.8%
Unusual finding	21	6.0%
Acute gangrenous appendices	24	6.8%
Chronic granulomatous inflammation	12	3.4%
Apendicular mass	12	3.4%
Total	350	99.7

Table 7: Shows histopathological profile with gender

Gender	Acute appendicitis	Acute supurative appendicitis	Fecolith	Lymphoid	Fibroid	unusual finding	Acute gangrenous appendices	Chronic granulomatous inflammation	Apendicular mass	
Male	57(16.29%)	42(12%)	33(9.42%)	20(5.71%)	16(4.57%)	15(4.28%)	12(3.42%)	6(1.71%)	7(2%)	208
Female	43(12.28%)	26(7.42%)	20(5.71%)	16(4.57%)	8(2.28%)	6(1.71%)	12(3.42%)	6(1.71%)	5(1.43%)	142
Total	100(28.57%)	68(19.43%)	53(15.14%)	36(10.28%)	24(6.86%)	21(6%)	24(6.86%)	12(3.42%)	12(3.42%)	350

Discussion

Anatomical position of appendix has a great importance in pathological and surgical diagnosis and management. According to various studies appendix is the organ with many anatomical variations in abdomen which can varies from patient to patient. The usual position of appendix can be visualized by various noninvasive imaging modalities. 13

The study done in 2021 in Pakistan at district Bannu by Iqbal T, et al. The objective was to determine different positions of the appendix in people of district bannu.it was a cross-sectional descriptive study with 500 sample size. The appendicitis was reported in acute abdomen, postmortem and in cadavers aging from 1 to 60 years. The position of appendix was observed from the sample and recorded. There were 57% retrocaecal, 28.6% pelvic, preileal 4%, post ileal 9.4% while the paracaecal and ectopic varieties were 5% reported from the sample.[14]

In the present study the sample size was 350 individuals from 10 years to 60 years individuals visiting to the tertiary care hospital of Peshawar KPK. The retrocecal position was 65.8%, pelvic was 21.7%, while postileal was 2.8 in the present study.

Another study done in which sample size was 377 to determine the frequency of vermiform appendix in group of corpses. there were 43.5% retrocecal, 24.4% were postileal, 2.4% were preileal, pelvic 9.3% and 0.27% were other positions where as 11.4 cm was length of the appendix.[15]

The Vermiform appendix differed in terms of anatomical position, mesoappendix, and length. A study

conducted by Tofighi H. et al. on cadavers in Iran. The Surgeons used the appendix's position in the body to diagnose and treat appendicitis. In the study there were 400 cadavers were selected randomly. Among 400 corpses, 306 were men while 94 were women cadavers. The appendix's anatomical locations were as follows: retrocaecal 7%, retroileal 12.5%, pelvic 55.8%, ectopic 4.2%, preileal 1.5%, and subcecal 19%. Gender did not show any correlation with the anatomical location. It depends on a number of factors, including race, diet, and geographical area of the patient. In the present study 60% were men and 40% were women who lived in rural areas while from 39% and 60.7% of people lived in cities. The majority of variations were discovered to be retrocecal (65.8%), followed by pelvic (21.7%), postileal (2.8%), subcecal (7.1%), and preileal (2.6%) in the present study while the sample size was 350 patients visiting to the tertiary care hospital of Peshawar KPK. The present study was not in accordance with the study done in iran because in Iranian population pelvic position was most common variation of the appendix while in KPK retrocecal position was commonly seen in the patients. The chage in variation can be influenced by ethnicity. According to the present study 68.1% of the patients spoke Pushto, compared to 4.8% of minorities and 26% of Urdu speakers. According to a study conducted in the Bannu district, retrocecal variation was the most common (57%) and preileal variation was the least common (4%). However, this finding contrasts with a study conducted in the Iranian population, which found that pelvic variation was the most common (55.8%) and preileal variation was 1.55.[16]

A 2014 study by M wachaka P et al. from the University of Nairobi's Department of Human Anatomy in the Black Kenyan Population examined on 48 cadavers in which the relationship between the spinoumbilical line and the appendix's location, length, and position was recorded. About 27% in 10 patients the retrocecal was the common position whereas subileal 36.4% was the most predominant variation in females.[16]

The present study done in tertiary care hospitals of Peshawar and Abbottabad KPK. The sample size was 350 among in which 60% were males while 40% were females living in rural 39% and 60.7% were living in urban areas. The most common variation found was retrocecal 65.8% while it was 21.7% pelvic, 2.8% postileal, 7.1% subcecal and was 2.6% preileal.

A study was conducted on histopathological profile of appendix by Kadi M. et al. In Jeddah, Saudi Arabia a King Abdulaziz University and Hospital. It was a retro-spective research involving 940 appendectomy patients. The research was conducted from 2010 to 2017. In the appendectomy specimen, mucocele, granulomas, faecolith, fecal and food impaction, endometriosis and schistosomiasis were among the other unexpected findings found in 3.93 percent of the specimen. In the current study, the unusual findings included 6% fecolith, 15.1% appendicular mass, 3.4% acute gangrenous appendices, 6.8% chronic granulomatous inflammation, and 3.4% appendicular mass.[17]

Another study by Khan A. Zubair et al. was conducted (department of surgery) at Rehman Medical College. From October to December 2019, the Rehman Medical Institute's Histopathology Unit conducted a descriptive cross-sectional study. The study's goal was to ascertain the rate of negative appendectomies with the introduction of additional diagnostic methods, as well as the histological findings of specimen extracted after appendectomy. The mean age of the 271 male and female participants was 28.59 ± 15.26 years. The most frequent diagnosis was acute appendicitis (51.66%), with follicular lymphoid hyperplasia coming in second (18.45%). Only 1.11% of cases were normal appendix or negative appendectomies. Xanthogranulomatus appendicitis (0.37%) and parasitic appendix (0.74%) were two of the uncommon results.[18]

In the present study acute appendicitis was 28.5% followed by fecolith 15.15 fibroid 6.8% lymphoid hyperplasia 10.3% while the unusual findings were 6%. Study done to analyze different histopathological findings seen in cases diagnosed as acute appendicitis. In the study the sample size was 219 cases with clinical diagnosis of appendicitis and histopathology reports were reviewed and different histopathological patterns were categorized. Age of the patient were from 2 to 59 years in which acute appendicitis 30.6%, tuberculous appendicitis 1.8%, carcinoid 0.5% 1% cases containing fecolith and 9.1% cases presenting with lymphoid hyperplasia.[19]

In the present study acute appendix was 28.5% followed by fibroid 6.8% fecolith 15.1% appendicular mass was 3.4% and unusual findings were 6%. The variation in appendix is important for the surgeon to manage the patient.[20] Therefore surgeon need to be aware of all these variations before planning the surgery, also doctors should be aware of histopathological findings because some histopathological problems need different management therefore radiological and CT scan investigation, clinical details and histopathological findings are needed for good management of appendicular mass and lesions.

Conclusion

The study concluded that retrocecal position was most common variation and acute supurative appendicitis is the common histopathological finding in appendix.

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