



POSITION, TYPES OF APPENDICITIS AND ITS RECOVERY TIME AFTER APPENDECTOMY IN TERTIARY CARE HOSPITALS OF PESHAWAR AND ABBOTTABAD

Dr. Arsalan Shah Roghani¹, Dr. Mubashar Khan^{2*}, Dr. Maryam Karim³, Dr. Amjad Ali Shah⁴, Dr. Syeda Gulrukh Saba, Shah⁵, Dr. Faizan Shah Roghani⁶

¹MBBS, Resident Surgeon, MTI - Khyber Teaching Hospital, Peshawar, Pakistan.

^{2*}MBBS, Medical Officer, Rehman Medical Institute, Peshawar, Pakistan.

³MBBS, Lecturer, Department of Anatomy, Pak International Medical College, Peshawar, Pakistan.

⁴MBBS, FCPS Surgery, HOD and Consultant General Surgeon, Northwest School of Medicine Peshawar, Pakistan.

⁵MBBS, MPhil Anatomy, CHPE. CHR, Assistant Professor Anatomy Department, Kabir Medical College, Gandhara University, Peshawar, Pakistan.

⁶MBBS, Resident Surgeon, MTI- Hayatabad Medical Complex Peshawar, Pakistan.

***Corresponding author:** Dr Mubashar Khan.

*Email address: Mubasharkhan890@gmail.com

ABSTRACT

Objectives: This study aims to determine the anatomical variation of appendix and its relationship with acute and chronic appendicitis with recovery time after appendectomy.

Material and methods: This was a cross-sectional study with 350 sample size in which 209 males and 141 females. They were from different ages and sexes. Exclusion criteria was severe burnt patient, patient with congenital anomalies and abdominal surgery, peritonitis, and any other reason which can change the anatomical position of appendix while inclusion criteria was patient visiting to the surgery department for abdominal pain, patient age from 10 to 60 years. The anatomical position was determine during surgery.

Results: It was a cross sectional descriptive study done in tertiary care hospitals of Peshawar, lady reading hospital ,Hayatabad medical complex, Khyber teaching hospital Peshawar and Abbottabad KPK. The sample size was 350 and age was from 10 to 60 years, meaning age was 28.78. Among 350 sample size 60% were male while 40% were female living rural 39% and 60.7% were living in urban areas. 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 recovery time after laparoscopy was 83% patients in one day while in open surgery was 81% patients in one day. Patient were mostly Pushto speakers 68.1%, while minority were 4.8% and urdu speakers were 26%. The chronic and acute appendicitis was 10% and 90% respectively.

Conclusion: The study concluded that retrocecal was the common position with 90% acute appendicitis and recovery of majority of patients were in both laparoscopic and open surgery was in one day.

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

Introduction

Knowledge and information regarding the different position of vermiform appendix is important because it leads to different signs and symptoms of acute appendicitis. These variations are important for intra-abdominal procedures.¹

Appendicitis is defined as the inflammation of the inner lining of the appendix. 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 length⁴ 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 change in position of the appendix is due to surgical intervention in the pelvis and abdomen. The most changeable organ in relation to organs, position and peritoneum is the vermiform appendix. Variation in the position of appendix, its length and size is important to understand for other abdominal procedures to diagnose acute abdomen. it can cause challenges in appendectomy. in some procedures can need an extension of incision and muscle splitting, prolong the operation time and complicate the surgery therefore preoperative planning is important to do.¹¹

There is still very fewer data or research about the appendix in KPK. Therefore, this study will aim to determine anatomical variations and types of vermiform appendix and its relationship with recovery time after appendectomy.

Material and methods

This was a cross-sectional descriptive study. The study was conducted in tertiary care hospitals of Peshawar. The sample size was 350 in which male were 209 and females were 142. The patients were randomly selected apply nonprobability convenience sampling. The sample was taken after the ethical approval of synopsis that is GU/Ethical Committ/2022/171. The age of the patients were from 10 to

60 years kpk population. The inclusion criteria was age from 10 to 60 years. The patients visiting for abdominal pain in surgery OPD or emergency, after investigations patient signed consent form for appendectomy. While Congenital anomalies, previous abdominal surgeries, peritonitis, and cancerous conditions and intestinal distension were excluded from the study. The variation in appendix was inspected by the surgeon and researcher in open and laparoscopic (both) procedures. All the findings were recorded by researcher on questionnaire. The data was put on excel sheet and then exported to the SPSS software version 16.

Results

It was a cross-sectional descriptive study done in tertiary care hospitals of Peshawar KPK; the Lady Reading Hospital, Hayatabad Medical Complex, Khyber Teaching Hospital, Peshawar and Abbottabad KPK. The sample size was 350 and age was from 10 to 60 years, means age was 28.78. The age was divided into five intervals patients from 10-20 years visiting the 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 recovery time after laparoscopy was 83% in one day while in open surgery was 81% in one day. Among 350 there were 60% males while 40% were females 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%.

Table 1: Shows sociodemographic profile of patient for 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 age of the patient and different position of appendix

Different position of appendix						
Age Groups	Retrocecal	Pelvic	Postileal	Subcecal	Preileal	Total
10-20	72 (20.5%)	23(6.57%%)	6(1.71%)	7(2%)	2(0.5%)	110(31.42%)
21-30	85 (24.28%%)	28(8%)	1(0.28%)	8(2.29%)	6(1.71%)	128(36.5%)
31-40	27(7.71%)	12(3.42%)	0	6(1.71%)	1(0.28%)	46(13.14%)
41-50	25(7.14%%)	6(1.71%)	0	1(0.28%)	0	32(9.14%)
51-60	21(6%)	7(2%)	3(0.86%)	3(0.86%)	0	34(9.71%)
Total	230 (65.1%)	76(21.71%)	10(2.9%)	25(7.14%)	9(2.57%)	350(100%)

Table 3: shows age of the patient and different position of appendix

Type of appendicitis	n	%
Acute	315	90%
Chronic	35	10%
Total	350	100%

Table 4: Shows age of the patient and procedure for appendectomy

Age Groups	Surgical_approach		Total
	laparoscopic	surgical	
10-20	0	110(31.42%)	110(31.42%)
21-30	14(4%)	114(32.57%)	128(36.57%)
31-40	5(1.42%)	41(11.71%)	46(13.14%)
41-50	2(0.5%)	30(8.58%)	32(9.14%)
51-60	2(0.5%)	32(9.14%)	34(9.71%)
Total	23(6.57%)	327(93.42%)	350(100%)

Table 5: Shows age of the patient and recovery time after Laparoscopy

Age Groups	after laparoscopy		Total
	One-Day	Two-Days	
21-30	10(43.47%)	4(17.39%)	14(60.87%)
31-40	5(21.73%)	0	5(21.73%)
41-50	2(8.69%)	0	2(8.69%)
51-60	2(8.69%)	0	2(8.69%)
Total	19(82.60%)	4(17.39%)	23(100%)

Table 6: Shows age and recovery day after open surgery of appendix

Age Groups	after open surgery			Total
	One-Day	Two-Days	Three-Days	
10-20	92(28.13%)	12(3.66%)	6(1.83%)	110(33.64%)
21-30	103(31.49%)	9(2.75%)	2(0.611%)	114(34.86%)
31-40	26(7.95%)	15(4.58%)	0	41(12.54%)
41-50	26(7.95%)	2(0.611%)	2(0.611%)	30(9.17%)
51-60	18(5.50%)	8(2.44%)	6(1.83%)	32(9.79%)
Total	265(81.03%)	46(14.06%)	16(4.89%)	327(100%)

Table 7: shows gender with surgical approach

Gender	Surgical_approach		Total
	laparoscopic	surgical	
male	17(4.85%)	191(54.57%)	208
female	6(1.71%)	136(38.86%)	142
Total	23(6.57%)	327(93.42%)	350

Table 8: shows gender with recovery time after laparoscopy

Gender	after laparoscopy		Total
	One-Day	Two-Days	
male	15(62.21%)	2(8.69%)	17(73.91%)
female	4(17.39%)	2(8.69%)	6(26.08%)
Total	19(82.60%)	4(17.31%)	23(100%)

Table 9: shows gender with recovery time after open surgery

Gender	after open surgery				Total
	One-Day	Two-Days	Three-Days	Five-Days	
male	159(48.62%)	26(7.95%)	3(0.92%)	3(0.92%)	191(58.41%)
female	106(32.42%)	20(6.12%)	10(3.05%)	0	136(41.59%)
Total	265(81.03%)	46(14.06%)	13(3.98%)	3(0.92%)	327(100%)

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 normal position of appendix can be visualized by various noninvasive imaging modalities. 12

The study done in 2021 in Pakistan at district bannu 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 in cadavers 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. 13

Another study done in which sample size was 377 and to determine the frequency of vermiform appendix in group of corpses. There was 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.14

A study has done in Iranian population on cadavers in which Vermiform appendix is different in terms of anatomical position, mesoappendix and length of the appendix. The position of appendix is important for surgeons for diagnosis and management of appendicitis. The crosssectional study done in Iranian population sample size was 400 randomly selected cadavers. Among 400 cadavers 306 were male while 94 were females. The cadavers were referred to autopsy from March 2010 to 2011 to Tehran province to autopsy hall for legal medicine organization of Tehran province to be autopsied. According to the study the anatomical positions of the appendix was retrocaecal 7%, retroileal 12.5%, pelvic 55.8%, ectopic 4.2%, preileal 1.5% and subcecal 19%. The mean length of appendix was 91.2mm in men and 80.3mm in females. Mesoappendix was complete and incomplete. The complete mesoappendix was 79.5% while incomplete mesoappendix was 20.5%. There was no association between gender and anatomical position of appendix. The factors such as geographical region, race and nutritional regiment play role in determining the position of appendix.15 In the present study among 350 individuals 60% were male while 40% were female living rural 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 subcecal 7.1% and 2.6% was preileal. Patient were mostly Pushto speakers 68.1%, while minority were 4.8% and urdu speakers were 26%. It is in accordance to study done in district bannu where retrocecal was the most common variation 57% and least common was preileal 4% but it contradict with the study done in iranian population where the most common variation was pelvic 55.8% while preileal was 1.55 the least common one. Study done in black Kenyan population on 48 cadavers obtained from the department of human anatomy at university of Nairobi kenya in 2014 on the determination of position and length of the appendix and relation of appendicular base with spinoumbilical line. The most common position of appendix was retrocecal 27% (10) while in females the most common variation was subileal 36.4% (4). The study reported average length of appendix was 76.5 ± 23.6 mm while the base of appendix was located below and above the spinoumbilical line in 25 (52.1%), 9 (18.8%), and 14 (29.2%) cases, respectively.16

In the Present study done in tertiary care hospitals of Peshawar and Abbottabad KPK. The sample size was 350 among which 60% were male while 40% were female living rural 39% and 60.7% were living in urban areas. The most common variation found was retrocecal 65.8% while was 21.7% pelvic, 2.8% postileal , 7.1%subcecal and was 2.6% preileal. The present study was not in accordance

with the study done in tertiary care hospital of Karachi to evaluate anatomical position of appendix and its association with acute appendicitis on Multidetector computed tomography (MDCT). It was a cross sectional study carried out in the department of anatomy in collaboration with department of radiology at Liaquat National Hospital. The sample size was 306 adult patients CT axial images were evaluated retrospective over a period of 6 months from 2021 to august 2021. Patient included were visiting to the hospital for abdominal MDCT scan for acute abdomen after ethical approval from ethical committee to find out anatomical variation of appendix with associated appendicitis. There were 52% were males and 48% were female with 32.97 years mean age. among the sample subcecal position was most common 27.8% ,postileal 25.5% pelvic 19.9% preileal 9.5% while postcecal 11.8% and ectopic were 5.6%.there was no significant association between position of appendix and gender while association between appendicitis ,anatomical position and age significant $p=0.05$ on MDCT (multidetector computed tomography).¹⁷

Appendectomy is most commonly performed procedure and both open and laparoscopy is still in practice. In the present study the outcome of both the procedure were evaluated .a study conducted in Sindh hyderabad, Liaquat University of Medical & Health Sciences Jamshoro. The patient visiting to hospital with acute appendicitis opened appendectomy were 52 while laparoscopic procedure were 48 done in the hospital. Outcome of the surgery were calculated considering operative time, time in the hospital after surgery, return to workplace and regular diet and postoperative complications were observed. Mean age of the patient were 25.08 for laparoscopy and 25.5 age for open procedure. There was decrease need for anesthesia with short stay in the hospital and early return to work in both the procedures but there were less complications in laparoscopic procedure as compare to open procedure and there was decrease consumption of time in open surgery as compared to laparoscopy.¹⁸

Another study done by Nazir A, Farooqi SA, Chaudhary NA, Bhatti HW, Waqar M, Sadiq A. Comparison of Open Appendectomy and Laparoscopic Appendectomy in Perforated Appendicitis to compared open and laparoscopic appendectomy, site of infection, stay at hospital and time of operation. It was a prospective randomized study conducted at surgery department, holy family hospital located in Rawalpindi. The sample size was 130 patient via lottery method with perforated appendix. The consent was signed by the patient. sample was analyzed by spss version 20.0.the site of wound infection was increased in open surgery 27.69% as compared to laparoscopic procedure 10.77% ($p=0.001$). Stay at hospital was longer in laparoscopic procedure 4.38 ± 1.09 days than in open surgery 4.18 ± 0.77 days while 46.98 minutes of open appendectomy and 53.02 minutes laparoscopic procedure. They concluded that laparoscopic appendectomy was associated with infection in small surgical site, shorter time for operation than open surgical procedure.¹⁹ A study conducted by Shahid MH, Khan FI, Askri ZA, Asad A, Saeed R, Talib TB, Khan AZ, Fatima T, Afzal MF. Two-Year Experiences of 500 Appendectomies in Lahore General Hospital, Lahore. The leading cause of abdominal condition is acute appendicitis. The sample was 506 , while mean age was 2.8 . there were 67.29% males with age 18 to 34 years affected by acute appendicitis.the operative time of laparoscopy is shorter as compare to open surgery open appendectomy 1.22 days was associated with a longer length of hospital stay than laparoscopic appendectomy 1 day. Simple acute appendicitis was the most predominant operation findings 289, 57.1%.²⁰

In the present study 90% acute appendicitis while chronic appendicitis was 10%. In the study 6.57% patients selected laparoscopic procedure while 93.42% selected open surgery. Patient recovered after laparoscopic procedure in one day were 82.60% while 17.39% recovered after two days. In open surgery 81.03% recovered in one day 14.06% recovered in two days while 4.89% recovered in three days. In the study 4.85% received laparoscopic procedure while 54.57% received open surgery among male patients while in female 1.71% received laparoscopic and 38.86% received open surgery procedure. The most variations in the anatomy of appendix was in position , size and length . it is important for the surgical procedures for the diagnosis of acute abdomine. Still in some procedures extension of incision, muscle splitting and time of operation can be prolong therefore preoperative planning is important to do . still researches are required on it.

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