

COMPARISON BETWEEN PREDICTED POSITION OF APPENDIX ON CLINICAL EXAMINATION AND POSITION OF APPENDIX AS AN INTRAOPERATIVE FINDING IN PATIENTS WITH CLINICALLY SUSPECTED ACUTE APPENDICITIS

Zafar Iqbal¹, Irum Sabir Ali^{2,3}, Mumtaz Khan³

ABSTRACT

Objectives: To compare the position of appendix as determined preoperatively on the basis of clinical examination with the intra-operative finding and to document the most common position of appendix on intra-operative finding.

Methodology: This cross sectional study of one year duration from February 2009 to January 2010 was conducted in Surgical "A" Unit, Lady Reading Hospital, Peshawar. Out of 100 admitted patients undergoing appendectomy, the position of appendix was compared preoperatively on the basis of clinical examination with the intraoperative finding.

Results: Out of 100 patients, 71% were males and 29% females, 53% were in the age group of 12-20 years, followed by 25% in age group of 21-25 years. The mean age was $22.63 \pm SD 8.58$ years. On preoperative clinically, retrocecal; pelvic; subcecal; paracecal and subhepatic position were observed in 51%, 25%, 13%, 06% and 05% cases respectively while on intra-operative examination, the frequency of positions were 56% , 23%, 10%, 07% and 04% cases respectively. For comparison between clinical and intraoperative position of the appendix, the p value of the retrocecal position was 0.478, subcecal position was 0.506, pelvic position was 0.741, paracecal position was 0.774 and subhepatic position was 0.733.

Conclusion: The most common position of appendix is retrocecal both on clinical and there is no difference between clinical diagnosis and intraoperative findings of positions of the appendix.

Key Words: Appendicitis, appendix position, appendectomy.

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INTRODUCTION

Acute abdomen is the commonest emergency and the most common cause of acute abdomen in-turn is acute appendix¹. In present time where modern diagnostic investigations are somewhat replacing the importance of clinical examination, a thorough clinical assessment still

remains to be the best criteria to reach a confident diagnosis. Total leucocyte count and other investigations should be used as diagnostic aid in doubtful cases but they don't replace the clinical skills of General Surgeons². Clinical evaluation of the patient is more sensitive in correctly categorizing those who need appendectomy than the ultrasound examination. Although the latter can be used in suspected cases and to rule out other pathological conditions resulting in acute abdomen³.

During childhood, continued growth of the caecum commonly rotates the appendix into a retrocaecal but intraperitoneal position⁴. In approximately a quarter of cases, rotation of the appendix does not occur resulting in a pelvic, subcaecal or paracaecal position. Occasionally, the tip of the appendix becomes extra peritoneal lying behind the caecum or ascending colon. Rarely, the caecum does not migrate during development to its normal position in the right lower quadrant of the abdomen. In these circumstances the appendix can

¹⁻³ Department of Surgery, Lady Reading Hospital, Peshawar - Pakistan

Address for Correspondence:

Dr. Irum Sabir Ali,
Department of Surgery,
Lady Reading Hospital, Peshawar - Pakistan
E-mail: irum1@hotmail.com

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be found near the gall bladder or, in the case of situs inversus viscerum, in the left iliac fossa causing diagnostic difficulty if appendicitis develops⁵. Planning and choice of surgical incisions should be based on an understanding of these anatomical variations since McBurney's original description was clinical rather than anatomical⁶. The rationale of the study was to compare the preoperative and intraoperative findings of positions of appendix and this study further provided information about accuracy of clinical features and clinical examination in the diagnosis of appendicitis regarding the preoperative assessment of position of appendix and correct decision regarding the plan for emergency surgery.

The objective of this study was to compare the position of appendix as determined preoperatively on the basis of clinical examination with the intraoperative finding. We also tried to document the most common position of appendix on intraoperative finding in our patients.

METHODOLOGY

This cross-sectional study was conducted at Surgical C Unit of the Surgical Department of Lady Reading Hospital, Peshawar. The duration of study was one year from February 2009 to January 2010. It was conducted on 100 patients clinically diagnosed as case of acute appendicitis and selected to undergo surgery. The sample size was not calculated by using any statistical formula. It was based on the number of cases of appendix conveniently seen in the given period of time. Convenient (non-probability sampling) was used.

All those patients above the age of 12 years undergoing surgery with preoperative clinical diagnosis of acute appendicitis were included in the study while all those patients on conservative treatment or with appendicular mass were excluded. Also excluded were patients with other intraabdominal finding like gallstones, Meckle's diverticulum or ovarian cyst diagnosed on ultrasound or patients with perforated appendix.

Each patient fulfilling the inclusion criteria, admitted to inpatients, after taking informed consent from patient, was included in the study. They were thoroughly examined by taking history and complete physical and clinical examination. Right iliac fossa tenderness, right hypochondrium tenderness, obturator sign and Psoas sign were seen to assess the position of appendix. Investigations like total leukocyte count, urine routine examination, x-ray kidney, ureter, bladder (KUB), ultrasound were done and preoperative clinical diagnosis of position of appendicitis was made in these patients. The

patient was operated and during the operation, position of the appendix was noted. All the information regarding clinical examination, history, investigations done and intraoperative position of appendix, were entered into proforma designed for this purpose.

All the variables that were studied were common presenting features, clinical examination, preoperative and intraoperative findings of position of appendix were calculated for frequencies, and percentages. Mean \pm standard deviation was calculated for age and for gender, male to female ratio was calculated. The results were expressed through tables, graphs and charts. Chi square test was used to compare the difference in clinical diagnosis and intraoperative diagnosis of position of the appendix. P-value ≤ 0.05 was considered as significant difference. All the study data was analyzed by computer programme SPSS version 12 for windows.

RESULTS

A cross sectional study comprised of 100 consecutive patients presented with acute appendicitis were studied for position of appendicitis. Out of 100 patients of acute appendicitis in this study, 71 (71%) were males and 29 (29%) were females.

In this study the youngest patient was 12 years of age and the oldest patient was 56 years of age. The mean age was $22.63 \pm SD 8.58$ (Table 1).

Area-wise majority of patients 59 (59%) were presented from district Peshawar followed by 12 (12%) patients presented from district Charsadda.

The positions of appendix on clinical examination and on preoperative findings are shown in Table 2. For comparison between clinical and intraoperative retrocecal position of the appendix, chi square test was applied on the data and $X^2 = 0.502$, DF = 1, P value = 0.478 which is showing that there is no significant difference between clinical and intraoperative diagnosis of retrocecal position of the appendix. For similar comparison between subcecal position of the appendix, again chi square test was applied on the data and $X^2 = 0.442$, DF = 1, P value = 0.506 which shows it to be insignificant. Like wise for pelvic position, chi square test was applied on the data and $X^2 = 0.110$, DF = 1, P value = 0.741.

Similarly for paracecal position of the appendix, chi square test was applied on the data and $X^2 = 0.082$, DF = 1, P value = 0.774 that again shows the difference to be insignificant. And finally for Subhepatic, chi square test was applied on the data and $X^2 = 0.116$, DF = 1, P value =

Table 1: Age Distribution of Patients (n=100)

Age Ranges	No. of Patients	Percentage
12 – 20 years	53	53%
21 – 30 years	34	34%
31 – 40 years	08	08%
41 – 50 years	03	03%
51 – 60 years	02	02%
Total	100	100%

Minimum age = 12 years, Maximum age = 56 years, Average age = 22.63 years \pm SD 8.58

Table 2: Comparison of Position of Appendix on Predicted on Clinical Examination and on Intraoperative Finding

Position of the Appendix	Clinical Assessment	Intraoperative Finding	P-value
Retrocecal	51%	56%	0.478
Pelvic	25%	23%	0.741
Subcecal	13%	10%	0.442
Paracecal	06%	07%	0.774
Subhepatic	05%	04%	0.733

0.733 which is showing that there is no significant difference between clinical and intraoperative diagnosis of subhepatic position of the appendix. On the basis of calculated X^2 test statistics it is concluded that there were no significant differences in various positions of appendix diagnosed clinically and intraoperatively.

DISCUSSION

Acute appendicitis is the most common cause of acute abdominal pain. Early diagnosis and management decrease morbidity and mortality. Diagnosis is usually based on clinical data, history and physical examination⁷. Appendectomy has been the treatment for acute appendicitis for over 120 years⁸. Open appendectomy is still the most common method of treatment of acute appendicitis⁹.

The diagnosis of uncomplicated acute appendicitis is often straightforward, allowing timely appendectomy without the need for expensive tests or imaging. Repeated clinical examination by an experienced surgeon has traditionally been the key to making the diagnosis in both straightforward and difficult cases.

Nonetheless, all surgeons will remove some normal appendices. Sometimes it can be particularly difficult to make the diagnosis, especially in the child under 5 years of age, in teenage girls, in young women and in the elderly. When difficult to make, the diagnosis may be significantly delayed and since the pathology is progressive, the patient may suffer potentially avoidable complications¹⁰.

Although most patients with acute appendicitis can easily be diagnosed, for many of them the signs and symptoms are variable and a firm diagnosis can be difficult. This is particularly true when the appendix is in the retrocecal or the retroileal position⁵. Retrocaecal appendicitis has been theorized to follow a more insidious course than other anatomic variants. Appendix location was not significant in that study, they found no significant association between retrocecal appendix anatomy and perforation at presentation¹¹.

Pelvic appendicitis in females may mimic pelvic inflammatory disease. Experienced surgeons can diagnose acute appendicitis accurately in more than 90% cases on clinical presentation of the patient, however in most cases junior surgeons and

residents have to decide whether to operate or not⁵.

In a local study appendix position was retrocecal in 65% and pelvic in 16% cases and 2.5% patients had sub hepatic appendix⁵. While in our study on preoperative clinical examination, retrocecal position of the appendix made in 51% cases, pelvic position in 25% cases, subcecal position in 13% cases, paracecal position in 07% cases and subhepatic position of appendix in 04% cases. The fact that retrocecal position is the most common was further confirmed in our study where intraoperative findings revealed that retrocecal position of the appendix was in 56% cases, pelvic position was in 23% cases, subcecal position was in 10% cases, paracecal position was in 07% cases and subhepatic position was made in 04% cases. However in contrast to our study an Iranian study done in 2003 showed that the incidence of pelvic appendix was the highest¹².

As our study's other objective was to compare difference between retrocecal position, subcecal position, pelvic position, paracecal position, subhepatic position of the appendix made by clinically and intraoperative diagnosis of position of the appendix, chi square test was applied on the data and results showed that there was no significant difference between clinical and intraoperative diagnosis of subhepatic position of the appendix. So our hypothesis that there are no differences in clinical and intraoperative diagnosis of positions of appendix, on the basis of calculated X^2 test statistics, it was concluded that there were no significant differences in various positions of appendix diagnosed clinically and intraoperatively.

CONCLUSIONS

Retrocecal position of appendix was found in majority of cases on clinical examination and intraoperatively while statistically there was no difference between clinical diagnosis and intraoperative findings of positions of the appendix. An experienced surgeon can make clinical diagnosis of position of the appendix with the help of a thorough clinical examination.

REFERENCES

1. Dado G, Anania G, Baccarani U, Marcotti E, Donini A, Resaliti A, et al. Application of clinical score for diagnosis of acute appendicitis in childhood: a retrospective

analysis of 197 patients. *J Pediatr Surg* 2000;35:1320-2.

2. O' Connell PR. The vermiform appendix. In: Charles WM, Russell R.C.G, Williams NS, editors. *Baily & Love short practice of surgery*. 24th ed. London: Arnold; 2004. P. 1203-18.
3. Ahmad AN, Fatima N, Hussain RA, Qadir SNR. Comparative evaluation of the role of sonography in diagnosis of acute appendicitis versus surgeon's clinical impression. *Ann KE Med Coll* 2003;9:27-8.
4. Islam F. Appendectomy in a patient with situs inversus. *J Postgrad Med Inst* 2004;18:127-8.
5. Gulzar S, Umar, Dar GM, Rasheed R. Acute appendicitis – importance of clinical examination in making a confident diagnosis. *Pak J Med Sci* 2005;21:125-32.
6. Naraynsingh V, Ramdass MJ, Singh J, Singh-Rampaul R, Mahraj D. McBurney's point: are we missing it? *Surg Radiol Anat* 2003;24:363-5.
7. Salari AA, Binesh F. Diagnostic value of anorexia in acute appendicitis. *Pak J Med Sci* 2007;23:68-70.
8. Styrud J, Eriksson S, Nilsson I, Ahlberg G, Haapaniemi S, Neovius G, et al. Appendectomy versus antibiotic treatment in acute appendicitis: a prospective multicenter randomized controlled trial. *World J Surg* 2006;30:1033-7.
9. Hou SK, Chern CH, How CK, Kao WF, Chen JD, Wang LM, et al. Diagnosis of appendicitis with left lower quadrant pain. *J Chin Med Assoc* 2005;68:599-603.
10. Lander A. The role of imaging in children with suspected appendicitis: the UK perspective. *Pediatr Radiol* 2007;37:5-9.
11. Herscu G, Kong A, Russell D, Tran CL, Varela JE, Cohen A, et al. Retrocecal appendix location and perforation at presentation. *Am Surg* 2006;72:890-3.
12. Golalipour MJ, Arya B, Azarhoosh R, Jahanshahi M. Anatomical variations of vermiform appendix in south-east caspian sea (Gorgan-IRAN). *J Anat Soc India* 2003;52:141-3.

CONTRIBUTORS

ZI collected and provided the data and ISA analyzed the results, reviewed the literature and wrote the article while the study concept was developed and supervised by MK.

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None Declared