ORIGINAL ARTICLE

PATTERN AND POSITIONS OF VERMIFORM APPENDIX IN PEOPLE OF BANNU DISTRICT

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ABSTRACT

Background: Vermiform appendix performs function immunologically and acts like a tonsil. The objective of the study was to determine different positions of appendix in people of district Bannu. **Methods:** It was a cross-sectional descriptive study conducted in district Bannu from January 1, 2009 to December 31, 2009. Sample size was 500, including appendices during surgery in acute abdomen, postmortem, and among dissected bodies. Vermiform appendices were observed in situ and positions recorded accordingly. **Results:** The age ranges was 1 to 60 years. Retrocaecal position was highest (57%) followed by pelvic (28.6%), post-ileal (9.4%) and pre-ileal (4%). The paracaecal and ectopic varieties were 5%. **Conclusion:** Retrocaecal is the commonest position followed by pelvic appendix.

KEY WORDS: Vermiform appendix, Position, Retrocaecal appendix.

INTRODUCTION

The vermiform appendix is a narrow blind tube or an appendage arising from the postero-medial wall of caecum. The word vermiform derived from the Latin word “vermiforma” means worm shaped or resembling worm, hence called ‘vermiform’. Anatomically, it is one of the mobile viscera of abdomen[1] with an average length of 6-9cms [1-3] about 1cm longer in male than in female.[4]

The appendix was probably first noted as early as the Egyptian civilization (3000 BC). Appendix was not found by Aristotle and Galen because they both dissected lower animals, which do not have appendices.[5] Celsus, however, probably discovered the appendix because he was allowed by Caesar to dissect criminals. Leonardo da Vinci first depicted the appendix in anatomic drawings in 1492.[2,6,7] In 1521, Jacopo Beregari da Capri, a professor of anatomy in Bologna, identified the appendix as an anatomic structure while Phillipe Verheyen give the term appendix vermiform in 1710.[8,9]

Vermiform appendix performs some functions related to gastrointestinal tract, the main function being immunological.[1,5] It has also been stated that vermiform appendix acts like tonsil. As the tonsil guard’s upper alimentary tract from bacteria, the vermiform appendix also guards the small intestine from bacteria present in the large intestine.[3,4] The other functions of appendix are physiological, microbiological and biochemical.[10]

The first authentic study of the position of appendix was conducted by Gladstone and Wakeley[11,12] in I924, who studied 3000 anatomic dissections. Previous to this, other authors had stated their belief, from observations at necropsy or operation, that the majority of appendixes are situated anteriorly, and that they are free and hang over the brim of the pelvis.

In the study conducted by Gladstone & Wakeley concluded that 69.2% were postcecal or retrocolic, 27.5% were pelvic lying on psoas major muscle near or hanging over the brim of the pelvis, 0.9% were anterior or pre-ileal, 0.5% were post-ileal, 1.86% were subcecal and 0.03% (one case) were ectopic.[12]

So the positions of the vermiform appendix are as follows: (a) retro caecal and retro colic passes retro peritoneally behind the caecum and ascending colon, (b) pelvic the tip of appendix passes downwards and medially, crosses right pelvic brim, (c) splenic or ileal type tip of the appendix passes upwards and medially in front or behind the terminal part of the ileal (pre or post ileal) (d) subcaecal and paracolic lies below caecum and tip ascends by the side of the ascending colon, and (d) midinguinal very rare type and tip of the appendix is directed vertically downwards. (Fig. 1)

People of district Bannu, being in a far flung district of the province, face great hardships in consulting the surgeons for management of acute abdomen including acute appendicitis. Furthermore no such study has been conducted so far in this region to address such problem.

Objective of this study was to determine the different anatomical position of the vermiform appendix among people of District Bannu.

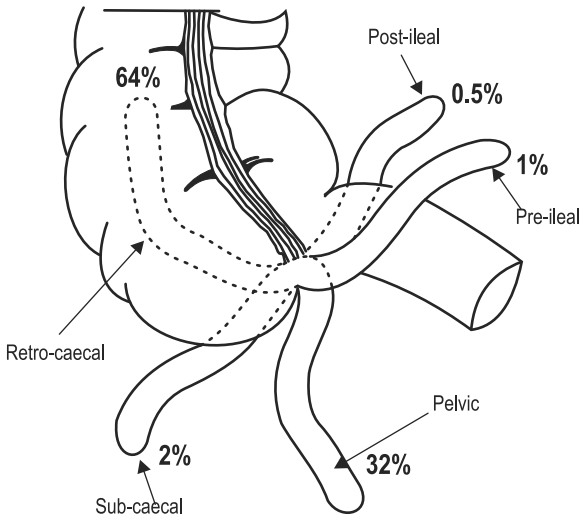

Fig.1: Drawing showing various positions of vermiform appendix.

MATERIAL AND METHODS

The study is of cross sectional descriptive type and conducted in district Bannu from January 1, 2009 to December 31, 2009. Sample of 500 people having appendixes opened for acute abdomen, during postmortem and dissected bodies at different centers in district Bannu. The centers from where the data was collected included Khalifa Gul Nawaz Teaching Hospital Bannu, District Headquarter Hospital Bannu and Nadir Medical Center (Private) Bannu. People with acute abdomen diagnosed as Acute Abdomen or Acute Appendicitis (previously no appendicectomy) were included in the study, while all cases brought for Postmortem or Dissection (appendicectomy done or not) were included in the study. Data was recorded on convenient non probability sampling.

The study was done in situ among all, before the organ was displaced by manipulation and dissection from the right iliac fossa. Written informed consent was obtained in all cases. The abdomen was opened by a long midline incision and the flaps were reflected to give a good view of the abdominal cavity along with its contents in case of postmortem and dissected bodies in dissection hall while by gridiron incision in patients with acute abdomen (acute appendicitis). The anterior caecal taenia coli act as the best guide for the vermiform appendix. Although the relation of the base of the appendix to the caecum is constant, the position of the vermiform appendix was studied in relation to the caecum, the terminal parts of ileum and the direction of the tip of the appendix. Accordingly, the position of the vermiform appendix was noted. The date was analyzed through Epi Info version 14.

RESULTS

Five hundred people were evaluated in this study for the purpose to ascertain the position of appendix. Age ranges was 1-60 years

The percentage of pelvic appendix was higher in younger age group that is 1-20 year of age while above this age the retrocecal type was common. The retrocecal are found in 285 (57%) cases, pelvic in 143 (28.6%) while pre and post ileal in 67 (13.4%) cases and the remainder 5 (1%) having ectopic position.

The Table 1 shows highest number of retrocaecal position of vermiform appendix among people.

Figure 2 shows the frequency of position and percentage of vermiform appendix as well as number of cases. This shows that pelvic type is more common in younger age group up to 20 years of age.

DISCUSSION

In the present study, the retrocaecal position was highest (57%) followed by pelvic (28.6%) and post ileal (9.4%), pre-ileal (4.0%) and the subcaecal and ectopic were rarely found.

Table 1: Showing position-wise frequency of vermiform appendix.

S. No.	Positions of appendix	Number of cases (n=500)	Percentage
1	Retrocecal	285	57.0
2	Pelvic	143	28.6
3	Post-ileal	47	9.4
4	Pre-ileal	20	4.0
5	Para-cecal /ectopic	5	1.0

Table 2: Frequency of pelvic position of vermiform appendix.

S. No.	Age in years	Pelvic	Percentage
1	1-10	50	10.0
2	10-20	39	7.4
3	20-30	19	3.8
4	30-40	21	4.2
5	40-60	14	2.8
Total		143	28.6

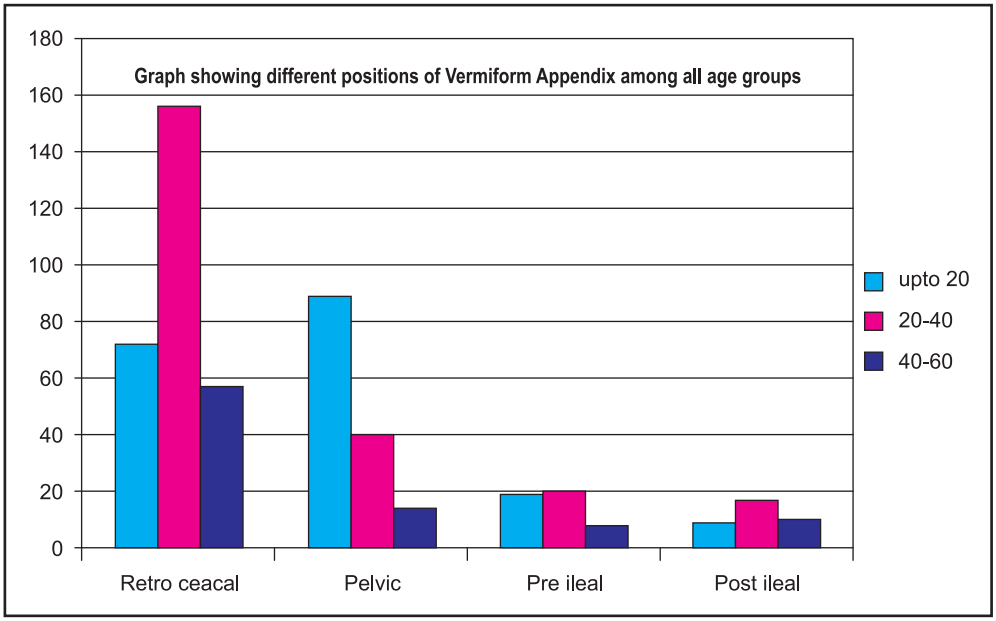

Fig. 2: Graph showing different positions of vermiform appendix among all age groups.

Table 3: Frequency of pre-ileal position of vermiform appendix.

S. No.	Age in years	Pre ileal	Percentage
1	1-10	7	1.2
2	10-20	12	2.4
3	20-30	11	2.2
4	30-40	9	1.8
5	40-60	8	1.6
Total		47	9.2

Table 4: Frequency of Post-ileal position of vermiform appendix.

S. No.	Age in years	Post ileal	Percentage
1	1-10	1	0.2
2	11-20	8	1.6
3	21-30	9	1.8
4	31-40	8	1..6
5	41-60	10	2
Total		36	7.2

The post-caecal or retro-colic positions of the appendix account for 57% (n=285) of the cases and constitute by far the most common site in this study. This is in accordance with the general experience of surgeons, pathologists and anatomists of the present day, but differs very markedly from the statistics, which have been published by older writers and quoted in many textbooks of Anatomy. The findings of the present study were similar to the findings made by Wakeley[12] (retrocecal 60%, pelvic 30% and pre and post ileal is12%), Maisel[13], Solanke and Gladstone and Wakeley where the retrocaecal position was higher than the pelvic variety. The present study did not coincide with the study carried out in Gorgan Teaching Hospital by Golalipour *et al*.[14,15] where pelvic variety was 33.3%, retrocaecal 32.4%, preileal and subcaecal were 12.8%. Katzarski and Dutta[17] did a study on Ghanians where the pelvic variety was more and this can be explained by racial variation.

The pelvic or descending position of the appendix is the second most common position, and was found in 28.6% of this series. As a rule, the tip of the appendix is directed downwards on the psoas major muscle and according to its length may hang over the brim of the pelvis. In younger people this is the commonest variety because of caecal development which coincides with the study of Golalipour[15] but he did not mention the cause. According to Katzarski and Dutta in Ghana medical journal in 1971, where the pelvic variety was more has explained the cause by racial variation.

The post-ileal position is rare 9.4% so only 47 cases being observed in the 500 cases examined. This is the commonest position, according to the teaching and writings of the late Sir Frederick Treves, and still quoted in most of the standard textbooks of anatomy.

The anterior or pre-ileal position is very rare (4%) in which the distal extremity of the appendix is directed upwards and forwards over the terminal part of the ileum. There is a long meso-appendix frequently extending up to the tip of the organ and there is often an ileo-caecal fold.

The sub-caecal position of appendix, in which the appendix is found beneath the caput caeci, was present in 1% of the cases, similar to study done in Bangladish by Paul et al.[16] The appendix lies in the iliac fossa and the peritoneal covering of that fossa alone separates the organ from the iliacus muscle. The appendix with its mesentery is twisted in a clockwise direction from left to right, and frequently its tip is directed upwards. Should an ileo-caecal fold be present, it may completely cover the root of the appendix.

Ectopic positions of the appendix may be present. In one case of our study the appendix was in the left iliac fossa because of situs inversus. In one case the appendix was pre-hepatic in position, while in one it was lying with the caecum in the umbilical region because of incomplete rotation of gut.

CONCLUSION

Retrocecal appendix is more common than other sites but decrease with increasing age. However to establish a proper data of position of appendix in human beings, further studies are necessary by using larger sample size from different age and sex groups.

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