



## Anatomical Variations in the Position of Vermiform Appendix – A Cadaveric Study

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### ABSTRACT

Appendicitis is one of the most common clinical conditions which require emergency surgery. Variations in the anatomical position of vermiform appendix can result in different clinical presentations. This study was carried on 50 human cadavers irrespective of sex and age from the department of anatomy over a periods of 10 months. In the present study the commonest position was retrocaecal(38%), followed by pelvic(28%), postileal(20%), subcaecal(10%) and midinguinal(4%). Preileal variety was not found. A thorough knowledge of normal anatomy and variations in the position of vermiform appendix is very important for the surgeons while performing abdominal surgeries in adult, children and infants as it helps them to make optimal diagnosis of various pathological conditions related to this organ and treat accordingly..

**Keyword:** Vermiform appendix, Appendicitis, Position.

### INTRODUCTION

The vermiform appendix is a narrow worm like diverticulum which arise from the posteromedial wall of the caecum about 2cm below the ileocecal junction and has no constant position. The length of appendix varies from 2 to 20cms with an average of 9cm<sup>1</sup>. The vermiform appendix is considered as a vestigial organ occupying variable positions. Histological differentiation of vermiform appendix shows that it is a specialized organ<sup>1</sup>. Its importance in surgery is due to mainly its potentiality for inflammation that results in the clinical syndrome known as ‘acute appendicitis’. Acute appendicitis is the most common cause of acute abdomen in young adolescents and it is often the first major surgical procedure performed by a surgeon in training<sup>2,3</sup>. The appendix usually lies in the right iliac fossa. The base of appendix is fixed whereas the remaining part may occupy any of the following positions which indicated with an hour hand of a clock. Retrocaecal (12 o'clock), Pelvic (4 o'clock), Subcaecal (6 o'clock), Preileal & Post ileal (2 o'clock), Promonteric (3 o'clock) positions. But there is no definite rule about the position of the vermiform appendix. It is thought that the position appendix is closely related to development of caecum and is highly variable<sup>4</sup>. A thorough knowledge of normal anatomy and variations in the position of appendix is the important for the surgeons while performing surgery such as appendectomy.

### MATERIALS AND METHODS:

The present study was undertaken in Department of Anatomy, Karpaga Vinayaga Institute of Medical Sciences & Research Centre, Kanchipuram dist. Tamilnadu, India from October 2013 to July 2014. The sample size taken was 50 adult human cadavers irrespective of age and sex from dissection hall of Anatomy department. Specimen were cleaned by routine dissection method and cleared specimen were brushed with the solution of acetone. Appendices were identified by tracing the taeniae coli on the

external surface of colon and caecum and then positions of appendix were noted. Photographs of the selected specimens taken at suitable magnification and specimens preserved in 10% formalin jars.

### RESULTS:

The following observations were made in specimens taken from 50 human cadavers irrespective of age and sex.

Position of appendix: Retrocaecal/retrocolic, Pelvic, Subcaecal, Pre ileal, Post ileal and Midinguinal.

We observed retrocaecal/retrocolic appendix in 19 specimens. (Photo.no.1).

Next common position noted was pelvic in 14 specimens.(Photo.no.2)

We noted post ileal (Photo.no.3) in 10 specimens, subcaecal (Photo.no.4) in 5 and midinguinal appendix (Photo.no.5) in 2 out of 50 specimens.

Table 1 showing position of appendix

Position of Appendix	No.of specimens	Percentage%
Retrocaecal/ Retrocolic	19	38
Pelvic	14	28
Post ileal	10	20
Pre ileal	-	-
Midinguinal	2	4

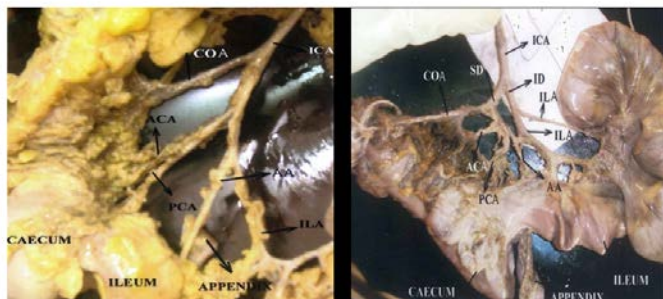
Subcaecal	5	10

Commonest position of appendix noted is retrocaecal / retrocolic[38%] followed by pelvic position [28%], post ileal [20%], subcaecal [10%] and midinguinal [4%]. we have not noted any pre ileal position or any ectopic position of appendix .

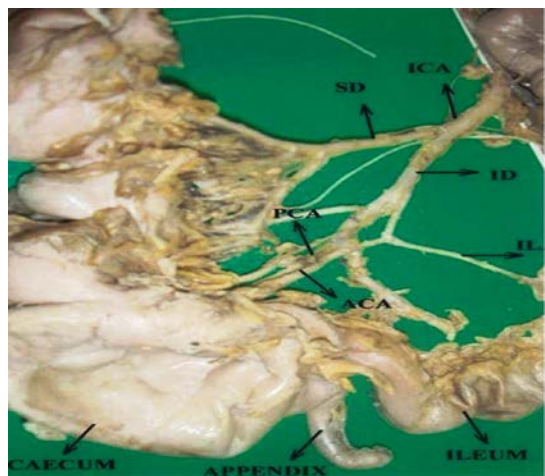
Photographs 1 & 2 showing the retrocaecal and pelvic position of appendix



Photographs 3 & 4 showing the postileal and subcaecal position of appendix



Photograph 5 showing the midinguinal position of appendix



### DISCUSSION:

The vermiform appendix has base, body and tip. Base of appendix has constant relationship with caecum, i.e on posteromedial aspect of caecum 2cm below ileocaecal opening but the tip can point in various directions and depending on the position of tip appendix.

Wakely[1933]<sup>5</sup>, Solanke[1970]<sup>6</sup>, Ajmani M L Ajmani K[1983]<sup>7</sup>, Ojeifo Jo et al[1989]<sup>8</sup>, Liucid et al[1997]<sup>9</sup> and R J Last[2006]<sup>10</sup> described retrocaecal/retrocolic as commonest

position with frequency ranging from 58 to 65%. In the present study retrocaecal/retrocolic is the commonest position with 38% frequency.

Katzurskj M.M et al [1979]<sup>11</sup> and Gotalipour M et al [2003]<sup>12</sup> mentioned pelvic as common position of appendix. In the present study it is second common position with 28% frequency. In the present study subcaecal position [10%] was comparable with Solanke [11.2%] and Gotalipour [12.8%]. No pre ileal position of appendix noted .

Midinguinal position described as rare by all authors, but in the present study the occurrence was 4%.

Solanke [1970] observed ileocaecal position in 29.2% and in the present study post ileal position was 20%. Wakeley [1933] mentioned ectopic position in 0.05%, in the present study no such position noted. Buschard & Kjaddgaard[1973]<sup>13</sup> mentioned anterior positions more frequent i.e pelvic and ileocolic than posterior positions i.e retrocaecal and subcaecal type which is comparable with the present study.

### CONCLUSION:

The present study was carried out in 50 human cadavers irrespective of age and sex. With reference to position of appendix the commonest position was retrocaecal or retrocolic (38%) followed by pelvic (28%). It is to be noted that pre ileal appendix was not observed in the present study. Therefore, It is very important for the surgeons to be aware of the possible variations in the positions of vermiform appendix, which may pose challenging, diagnostic and therapeutic problems while doing many abdominal surgeries.

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