

INCIDENCE OF DIFFERENT POSITIONS AND MORPHOMETRY OF VERMIFORM APPENDIX

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ABSTRACT

BACKGROUND

Vermiform appendix is a worm like diverticulum on the posteromedial wall of caecum. Knowledge of position and morphometry of the appendix is important because it may produce variable symptoms and signs which mimic other diseases. Its position is also important during appendectomy because it may necessitate extension of a transverse incision or additional muscle splitting.

MATERIALS AND METHODS

This study was carried out in 35 cadavers in the Department of Anatomy at All India Institute of Medical Sciences, Jodhpur and SMS Medical College, Jaipur in routine dissection by undergraduate students. The position of various appendixes were observed and classified accordingly. Also, the various morphometric parameters were measured.

RESULT

In this study, the positions of appendix were pelvic type in 51.42% (18), retrocaecal type in 34.28% (12), preileal type in 5.71% (2), paracolic type in 5.71% (2) and promontoric type in 2.85% (1) out of 35 cadavers. Other parameters and its details shall be discussed in the presentation.

CONCLUSION

Vermiform appendix shows variations in the position and length. Surgeon should know about the different positions of appendix during appendectomy. The position and various morphometric parameters of the vermiform appendix are important in influencing the differential diagnosis of acute abdomen.

KEYWORDS

Vermiform Appendix, Morphometry, Position.

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BACKGROUND

Vermiform appendix is named because of its worm like appearance. The vermiform appendix is located in the lower right quadrant of the abdomen.¹ The base of the vermiform appendix lies 2 cm beneath the ileocaecal valve.^{2,3} It is a blind ended diverticulum on the posteromedial wall of caecum. Vermiform appendix of modern human is a shrunk part of caecum.⁴ In primates appendix is a part of digestive tract which breaks down cellulose, but in human beings it is a component of mucosal immune system.⁵ Human appendix is a safe house for beneficial bacteria which save when illness flushes those bacteria from rest of the intestines.⁶ Appendix is highly diverse in position, shape and size.^{7,8} Variable positions of vermiform appendix depends on the direction of tip, it may be retrocaecal

(Posterior to caecum, 12'o clock), pelvic (4'o clock), promontoric (3'o clock), pre and post-ileal (Behind or in front of ileum, 2'o clock), subcaecal (11'o clock), or mid-inguinal (6'o clock).⁹ The length of vermiform appendix varies from 2-20 cm.¹⁰ The diameter of the vermiform appendix varies from 4-12 mm. The aim of this study is to investigate the different positions of vermiform appendix along with its morphometric parameters such as length, diameter, which is necessary to know during appendectomy.

MATERIALS AND METHODS

This study was carried out on 35 cadavers in the Department of Anatomy at All India Institute of Medical Sciences, Jodhpur and SMS Medical College, Jaipur in routine dissection by undergraduate students. The position of various appendixes were observed and classified accordingly. Also, the various morphometric parameters (Length and diameter) were measured by using Vernier calliper. Length of vermiform appendix was measured from the base to the tip of appendix and diameter was measured from the base as shown in Figure 1 and 2.

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Figure 1. Showing Measurement of Length of Vermiform Appendix



Figure 2. Showing Measurement of Diameter of Vermiform Appendix

RESULTS

In this study, the variation in the position, length and diameter of vermiform appendix was as follows-

Position

The most common position of vermiform appendix was found to be pelvic in 51.42% (18 cadavers) cases and the least found was promontoric i.e. in 2.85% (1 Cadaver) cases. We did not find any case of mid-inguinal position of appendix.

Length

In this study, the length of appendix varies from 31.5 mm (Minimum) to 110.5 mm (Maximum). Average length of vermiform appendix in male was 75.02 mm and in female was 63.27 mm.

Diameter

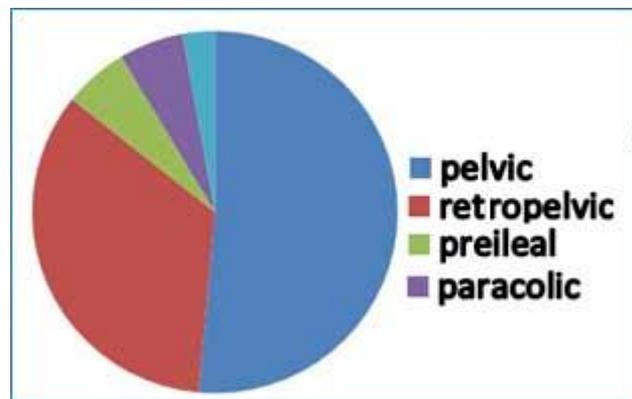
The diameter of vermiform appendix varies from 4 mm (Minimum) to 10.5 mm (Maximum). Average diameter of vermiform appendix in male was 8 mm and in female was 7.8 mm.



Figure 3. Showing Pelvic position of Vermiform Appendix

Sl. No.	Position of Vermiform Appendix	In Male (n)	In Female (n)	Mean Length (mm)	Mean Diameter (mm)
1.	Pelvic	12	7	57.52	7.32
2.	Retrocaecal	6	4	78.73	8.21
3.	Preileal	3	0	109.5	9.83
4.	Paracolic	2	0	95	7.6
5.	Promontoric	0	1	49	10.1

Table 1. Showing the Incidence of Different Positions, Length and Diameter of Vermiform Appendix



Graph 1. Showing Position Vermiform Appendix

DISCUSSION

In this study, the prevalence of the different positions of vermiform appendix amongst populations varies with the pelvic position being commonest which is similar to Ashindoitang JA et al (2012), whereas in other studies retrocaecal position was commonest (Collins, 1932; Bakheit and Warille, 1999). According to Okazi A et al,³ incidence of positions of vermiform appendix were pelvic, subcaecal, retroileal, retrocaecal, ectopic and preileal in 55.8%, 19%, 12.5%, 7%, 4.2% and 1.5% respectively and the mean length of vermiform appendix was 91.2 mm and 80.3 mm in men and women, respectively. It seems that many factors including race are involved in determining the position of the appendix. Siva Nageswara Rao studied adult as well as foetal appendix, and he found incidence of retrocaecal appendix was the most common position.¹¹

According to Lamptey, retrocaecal position is less prone to inflammation.¹² Our finding is similar to Amir Denjalic and Gosalipoor¹³ study in Iran who evaluated the patients in surgery ward and Yabunaka¹⁴ study who evaluated the size of appendix by sonography and Ahmad Irfan study who estimated the appendix size through therapeutic laparotomy. The most common type of appendix in all these studies was pelvic appendix. In this study, the average length of appendix was 75.02 mm in male and 63.27 mm in female and average diameter of appendix was 8 mm in male and 7.8 mm in female which were higher than the study of Siva Nageswara Rao, Sundara Setty¹¹ (2013).

Population	Pelvic (in %)	Retrocaecal (in %)	Postileal (in %)	Preileal (in %)	Subcaecal (in %)
Iran ³	55.8	-	12.5	4.2	19
Pakistan ⁵	28.6	57	9.4	4.0	-
Croatia ⁷	26	38	-	-	8
Ghana ¹²	21.6	67.3	3.8	4.9	-
Bangladesh ¹⁵	31.7	65	3.3	-	-

Table 2. Showing the Positions of Appendix in Various Populations

CONCLUSION

These anatomical features of vermiform appendix are important during appendectomy because it may necessitate extension of a transverse incision or additional muscle splitting. In this part of the world where open appendectomies are common, surgeons need to be aware of this variation for better operative outcomes. The positions and various morphometric parameters of the vermiform appendix are important in influencing the differential diagnosis of acute abdomen.

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