

## A STUDY TO ASSESS THE PROPORTION AND ASSOCIATION OF APPENDICITIS WITH POSITIONAL VARIATION IN A SOUTH INDIAN RURAL TERTIARY CARE CENTER

Sandeep Kumar David<sup>1</sup>, B. K. Easwara Pilla<sup>2</sup>, Raveendran<sup>3</sup>, Sinnet P. R<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of General Surgery, Dr. SMCSI Medical College, Karakonam, Kerala.

<sup>2</sup>Professor, Department of General Surgery, Dr. SMCSI Medical College, Karakonam, Kerala.

<sup>3</sup>Professor, Department of General Surgery, Dr. SMCSI Medical College, Karakonam, Kerala.

<sup>4</sup>Post Graduate Student, Department of General Surgery, Dr. SMCSI Medical College, Karakonam, Kerala.

---

### ABSTRACT

---

#### CONTEXT

The commonest position of appendix vermiformis according to the literature is retrocaecal. While during surgery there was found to have variation. Several studies done to assess the position of appendix vermiformis in patients with acute appendicitis has given a conflicting results. Depending on the position the symptom complex also changes, producing different problems and differential diagnosis.

#### AIM

This study assess the position of appendix vermiformis in patients with inflamed appendix in the patients undergoing surgery for acute appendicitis at Dr. SM CSI Medical College, Karakonam.

#### DESIGN METHOD AND ANALYSIS

The study is a retrospective study done over 2 years in 109 patients who underwent appendicectomy at Dr. SMCSI Medical College. The prevalence of appendicitis among different age groups, and the different position were studied.

#### RESULTS

Of the 109 patients 71 were females and 38 males. In the study population 21-40 years age group had the highest frequency of appendicitis. Subcaecal position was seen in 49.5 % of the patients followed by 28.4%. In both the sex group sub caecal position is the commonest position with 57.9% and 45.1% respectively in male and female patients.

#### CONCLUSION

Among the patients with acute appendicitis subcaecal position was the commonest position.

#### KEYWORDS

Acute Appendicitis, Retrocaecal, Subcaecal, Appendix.

---

**HOW TO CITE THIS ARTICLE:** David SSK, Pillai BKE, Raveendran, et al. A study to assess the proportion and association of appendicitis with positional variation in a south Indian rural tertiary care center. J. Evid. Based Med. Healthc. 2016; 3(19), 770-772. DOI: 10.18410/jebmh/2016/176

---

**INTRODUCTION:** Appendicitis is the most common surgical emergency seen in causality. Although it is a common surgical condition, coming to a definitive diagnosis of acute appendicitis is cumbersome. Difficulty that is seen while making a diagnosis is because of the myriad symptoms, which the inflamed appendix can produce.

The common positions of normal appendix are retrocaecal (74%), pelvic (21%), paracaecal (2%), subcaecal (1.5%), preileal (1%) and postileal (0.5%)<sup>(1)</sup> In case of inflamed appendix, different studies pointed out differently about the position of appendix (ref). Clinical features may vary according to the position of the inflamed appendix. Based on certain clinical features and few biochemical tests several scoring systems like Alvarado

scoring system and RIPASA scoring system can be applied to diagnose acute appendicitis. Investigations like Ultrasonogram may be done as an adjunct to clinical examination. CECT abdomen is the gold standard test to diagnose appendicitis preoperatively. The treatment of appendicitis is Appendicectomy, either open or laparoscopy. The complications of untreated appendicitis are appendicular gangrene, appendicular perforation, appendicular abscess and appendicular mass formation. So surgery should be done as early as possible. Present study was undertaken to identify the common positions of inflamed appendix in south Indian rural population and also its relationship with gender and age groups.

---

Submission 22-02-2016, Peer Review 26-02-2016,

Acceptance 29-02-2016, Published 07-03-2016.

Corresponding Author:

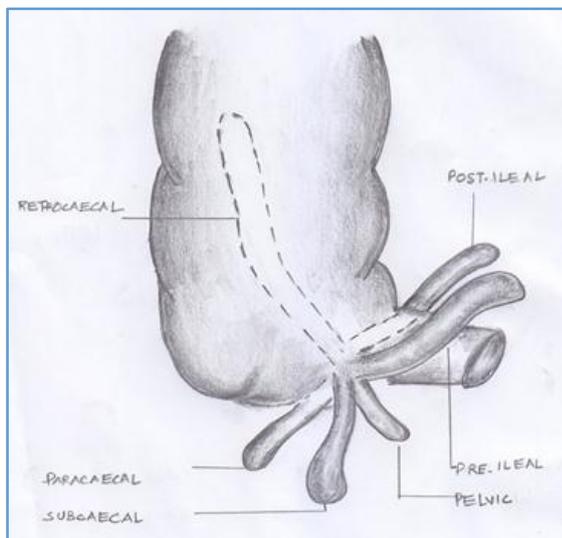
Dr. Sandeep Kumar David S,

Irene Hospital, Asaripallam Road,

Near Derrik Mart, Nagercoil-629001.

E-mail: [davidsan\\_dr@yahoo.com](mailto:davidsan_dr@yahoo.com)

DOI: 10.18410/jebmh/2016/176



**Fig. 1: Various position of Vermiform Appendix**

**MATERIAL AND METHODS:**

**Study Design:** Single centered, retrospective and cross sectional study, conducted on 109 patients diagnosed with appendicitis and underwent Appendicectomy at Dr. SMCSI Medical College, Karakonam.

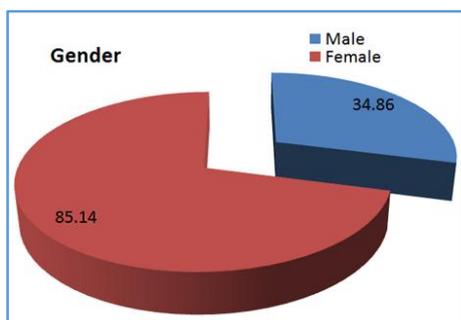
**Period of Study:** The study was done between January 2014 and December 2015 at Dr. SMCSI Medical College, Karakonam.

**Inclusion Criteria:** Patient above the age of 12 years, who underwent Appendicectomy and post-operative pathologically confirmed Appendicitis.

**Exclusion Criteria:** Age less than 12 years are excluded because of the variable position of caecum. Pathologically negative Appendicectomies were also excluded. Complicated appendix like appendicular abscess or mass formation were also excluded because of the difficulty in identifying the position of appendix.

**STATISTICAL ANALYSIS:** The analysis of this study was made by SPSS software.

**RESULTS:** The study was done in 109 patients, who underwent Appendicectomy at Dr. SMCSI Medical College and confirmed by histopathology. Of these patients 71 were female and 38 were male.



**Fig. 2: Sex distribution of Appendicitis**

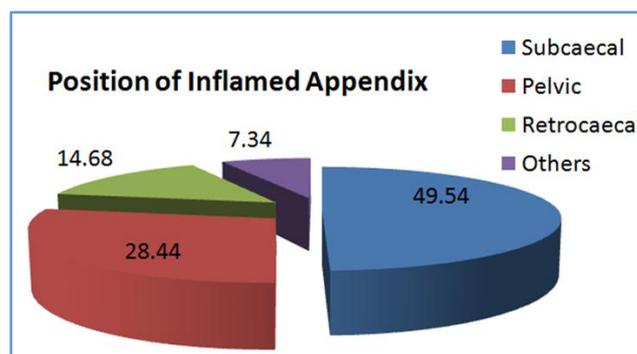
In our study the age distribution was between 12 years and 65 years with a mean age of 38.5 years. The patients were divided into three groups those less than 20 years [group 1], 21-40 years [group 2] and more than 41 years [group 3].

In the group 1 & 2, subcaecal position is the commonest position in both male and female patients. In the third group, pelvic position is common among males, while in females both sub caecal and pelvic position were distributed equally.

	Age	Frequency (%)
Group 1	12 to 20	29 (26.6)
Group 2	21- 40	57 (52.3)
Group 3	>41	23 (21.1)

**Table 1: Frequency of Appendicitis with age**

Overall the most common position of inflamed appendix is subcaecal followed by pelvic, retrocaecal and others.



**Fig. 3: Position of Inflamed Appendix**

Position of Inflamed Appendix	Gender	
	Male n (%)	Female n (%)
Subcaecal	22 (57.9)	32 (45.1)
Pelvic	10 (26.3)	21 (29.6)
Retrocaecal	5 (13.2)	11 (15.5)
Others	1 (2.6)	7 (9.9)

**Table 2: Position of inflamed Appendix by sex**

**DISCUSSION:** The variation in the position of vermiform appendix produces different clinical symptoms and signs. An inflamed appendix lying on the psoas muscle will cause pain when the right hip is extended and the patient will, often a young adult, will lie with the right hip flexed for pain relief. If the inflamed appendix is in contact with obturator internus, flexion and internal rotation of right hip joint, will cause pain in the hypogastrium. But Baldwin’s test is positive when the inflamed appendix is in the retrocaecal position. Sometimes in pelvic appendicitis, while doing rectal examination, tenderness may be seen in recto vesical pouch or in pouch of Douglas. Frequency of micturition may be seen when the inflamed appendix is in contact with the bladder.<sup>(2-4)</sup>

According to the current literature, retrocaecal appendix is the most common type. This has been corroborated in many studies done in cadavers. A study conducted in the Iranian population, over 200 cadavers, came to the conclusion that pelvic position of appendix was the most common one.<sup>(5)</sup> While in another cadaveric study done at Bangladesh, retrocaecal position was more common.<sup>(6)</sup> Among the Kenyan population, following a study in 48 cadavers, retrocaecal position was found to be more common in males and subileal position in females.<sup>(7)</sup>

Recent studies done in patients with inflamed appendix have pointed out that retrocaecal appendix is not that common as was believed. Variations from the previous teaching regarding the position of vermiform appendix have been noted more in patients with appendicitis compared to those in normal individuals. In Ghana, a study was done incorporating cadavers having both normal and inflamed appendix and found that, retrocaecal position was the most commonest position while non retrocaecal position in cadavers with inflamed appendix.<sup>(8)</sup> Another study also had similar conclusion.<sup>(9)</sup>

In our study subcaecal position is the most common position seen in 49.54 % of the patients. The same holds true for both the sexes.

In a study done on cadavers in Kenya, commonest position is retrocaecal [27%] in males and subileal [36.4%] in females. In another study done in Bangladesh pelvic position was seen more among the male individuals.<sup>(6)</sup>

**CONCLUSION:** Among the patients attending the surgical department with acute appendicitis in our hospital, subcaecal appendix is the most common position.

#### REFERENCES:

1. Bailey KC. Love's short practice of surgery. 2013;26<sup>th</sup> Edition.
2. Richard A, Williams PM. Pathology of the appendix and its surgical treatment. 1994;1<sup>st</sup> edition.
3. Norman S, Williams C. The vermiform appendix. Bailey and Love's short practice of surgery 2013.
4. Smith PH. The diagnosis of appendicitis. *Postgrad Med J* 1965;41:2-5.
5. Ghorbani A, Forouzesh M, Kazemifar AM. Variation in anatomical position of vermiform appendix among iranian population: an old issue which has not lost its importance. *Anat Res Int* 2014;Article ID 313575:pp 4.
6. Paul UK, Naushaba H, Begum T, et al. Position of vermiform appendix: a postmortem study. *Bangladesh J Anat [Internet]* Aug, [cited Dec 2015] 2009;7(1):34-6.
7. Mwachaka P, El-busaidy H, Sinkeet S, et al. Variations in the position and length of the vermiform appendix in a black kenyan population. *ISRN Anat [Internet]* Jan, 2014;Article ID 871048:1-5.
8. Clegg-Lamptey JN, Armah H, Naaeder SB, et al. Position and susceptibility to inflammation of vermiform appendix in Accra, Ghana. *East African Medical Journal. Kenya Medical Association* 2006;83(12):670-673.
9. Sarela A. The retrocaecal appendix appears to be less prone to infection. *Br J Surg* 1996;83(6):867-8.