(e) ISSN Online: 2321-9599
(p) ISSN Print: 2348-6805

# ORIGINAL ARTICLE

## CORRELATION BETWEEN THE POSITION OF APPENDIX AND INCIDENCE OF APPENDICITIS

Karnail Singh[1], Sanjeev Gupta[2], Rommel Singh Mohi[2], Senthil Kumar[3]

[1]Associate Professor, [2]Assistant Professor, [3]Jr, Department of General Surgery, Government Medical College, Patiala, Punjab, India

**ABSTRACT:**
The position of appendix varies widely amongst humans. The presenting signs and symptoms vary according to the position. In this study, position of appendix was compared in patients with appendicitis and normal individuals in order to derive a conclusion whether any position of appendix predisposes to appendicitis attack. Various signs and symptoms were also studied with respect to various positions.50 patients with diagnosis of appendicitis and 50 patients undergoing explorative laparotomy for any other conditions with normal appendix were studied. Although the position of appendix influences the clinical presentation of the appendicitis, yet there is no predilection of any position of the appendix to get inflamed.
**Key words:** Appendix, appendicitis

Corresponding Author: Dr. Karnail Singh, Associate Professor, Department of General Surgery, Government Medical College, Patiala, Punjab, India

This article may be cited as: Singh K, Gupta S, Mohi RS, Kumar S. Correlation between the position of appendix and incidence of appendicitis. J Adv Med Dent Scie Res 2016;4(6):220-222.

| Access this article online | |
|---|---|
| Quick Response Code | Website: www.jamdsr.com |
| | DOI: 10.21276/jamdsr.2016.4.6.53 |

## INTRODUCTION:

Acute appendicitis is a common and sometimes confusing cause of acute abdominal pain for all age groups. Diagnosis of appendicitis can be difficult, occasionally taxing the diagnostic skills of even the most experienced surgeons. The delay in the diagnosis arises from errors of judgements especially if surgeon does not have knowledge about varied clinical presentation of appendicitis due to variations in the position of appendix. The most common position of appendix as described by many authors like Wakeley et-al[1] is retrocaecal {65.3%}, Collins et-al[2] is pelvic {78.5%} and Pickens G et-al[3] is post ileal. There are lots of controversies regarding various positions of appendix and clinical presentation of appendicitis, in relation to different studies. This study intended to compare the position of appendix in the normal population and in patients with appendicitis.

## MATERIALS AND METHODS:

The prospective study comprised of two groups of patients, each group consisting of 50 patients each. First group (Appendicitis Group) comprised of patients who were ill enough to warrant surgery for suspected appendicitis and in the second group (Laparotomy Group) patients who underwent exploration for conditions other than appendicitis, having normal appendix were considered for comparison.

**Appendicitis Group:** A detailed history and a careful examination in terms of local temperature, guarding/rigidity, site of maximum tenderness, presence of swelling or mass , rebound tenderness, Rovsing's sign, Psoas sign, Obturator sign, Baldwin's sign and per rectal examination for any pelvic tenderness was done. All patients were subjected to an ultrasonographic examination to exclude any other associated pathology and also to confirm the diagnosis in doubtful cases. The required biochemical investigations were done. Patients who were diagnosed as acute appendicitis were taken up for surgery. Specimen was sent for histopathological examination and confirmed cases were included in the study.

**Laparotomy Group:** The other group of patients were diagnosed to have an acute abdomen (perforation, intestinal obstruction), blunt trauma abdomen (hemoperitoneum), and undergoing elective procedures where midline incision was given for laparotomy were taken as comparative group. During surgery position of appendix and whether it was fixed or freely mobile in the peritoneal cavity was noted and recorded.

The position of appendix was noted in both groups and the percentage was calculated in each group. Clinical presentation was noted with respect to position of appendix. An attempt was also made to correlate the position of appendix with the propensity for

inflammation. The results so obtained were studied in relation to available world literature

**Observations:** 35 cases (70%) were operated on an emergency basis and the rest were elective cases (30%). Two cases presented with appendicular mass which were managed conservatively and subsequently appendicectomy was done. In our series male to female ratio was 2.8:1. About 46% cases ie 23 of 50 cases presented with atypical symptoms. In 41 cases, the site of maximum pain was in right iliac fossa. Only 9 cases had maximum pain at a site other than right iliac fossa.In group II, The site of maximum tenderness was in right iliac fossa in 35 of 50 cases even though few had tenderness at other sites leading to difficulty in the diagnosis. 5 cases had tenderness at Mcburny point. Only 15 cases had maximum tenderness at a site other than right iliac fossa. Leucocytosis or neutrophilia was present in 36 of the 50 cases, with an accuracy of 72%.

68 % of patients in appendicitis group and 62% in laparotomy group had retro-caecal appendix making it as most common position.The clinical presentation of appendicitis varied with the position of appendix with the retro-caecal position (44.1% of cases), post ileal position ( 60%), and pelvic position ( 62.5% of cases) presenting with atypical symptoms. (Table 1)

Baldwin test and psoas sign were positive in 12 cases of retrocaecal appendicitis which were either fixed by adhesions or by its extra-peritoneal location. Obturator test was positive in 5 cases of pelvic appendicitis, which presented with complications; in uncomplicated cases this test was rarely elicited. The complications like gangrene, perforations, abscess or mass formation or generalized peritonitis was seen in 60% of patients with retro-caecal, in 33.3% with post ileal and 60% in pelvic position who presented atypically, whereas in those with typical presentation only 21% of the patients with retro-caecal position had complications. In post ileal and pelvic position none of the patients with typical presentation had any complications and 56.5% of the patients with atypical presentation had complications (**Table 1**). In all the other positions complications were not seen. In 44.4% of cases of fixed retro-caecal position, appendix was fixed either because of the adhesions or the extra-peritoneal fixation of the appendix during development, presented atypically while none of the cases with mobile appendix presented atypically. These patients presented with flank pain, tenderness and symptoms of urinary tract infection. In post ileal position, the patients presented atypically in 3 cases (60% of post ileal cases) of which 1 (20%) case was having mobile appendix, and 2 cases having fixed appendix (40%). In pelvic appendix the patients presented atypically in 5 cases of which 3 cases had mobile and 2 cases had fixed appendix constituting 37.5% and 25% of the total pelvic cases respectively. In all other positions, the appendicitis presented in a typical manner. It is clearly evident from our study that there is no predilection of any position of appendix to get inflamed (Table 3). The difference regarding the position of appendix in appendicitis group and laparotomy group came out to be non significant.

There is an increased incidence of complications in those with atypical presentation than typical presentation. (**Table 4**). The difference came out to be significant. Also that retrocaecal fixed appendix is associated with more complications (53%) as opposed to (23.5%) of the cases with mobile appendix. Atypical presentation has more complications than typical presentation.

**Table 1:** Position of appendix with clinical presentation and complications

| Position | Typical presentation | | Atypical presentation | | Total | |
|---|---|---|---|---|---|---|
| | uncomplicated | complicated | uncomplicated | Complicated | uncomplicated | complicated |
| Retrocaecal | 15 | 4 | 6 | 9 | 21 | 13 |
| Postileal | 2 | _ | 2 | 1 | 4 | 1 |
| Preileal | 2 | _ | _ | _ | 2 | _ |
| Pelvic | 3 | _ | 2 | 3 | 5 | 3 |
| Paracaecal | 1 | _ | _ | _ | 1 | _ |
| Total | 23 | 4 | 10 | 13 | 33 | 17 |

**Table 2:** Relationship between fixity of the appendix and clinical presentation

| | Typical presentation | | Atypical presentation | |
|---|---|---|---|---|
| POSITION | Mobile | Fixed | Mobile | Fixed |
| Retrocaecal | 17 (50%) | 2(5.6%) | 0(0%) | 15(44.4%) |
| Postileal | 2(40%) | 0(0%) | 1(20%) | 2(40%) |
| Pelvic | 3(37.5%) | 0(0%) | 3(37.5%) | 2(25%) |

**Table 3:** Statistical comparison of position of appendix in appendicitis group and laparotomy group

| Position | Appendicitis group | Laparotomy group | Total |
|---|---|---|---|
| Retrocaecal | 34 | 31 | 65 |
| Paracaecal | 1 | 1 | 2 |
| Postilial | 5 | 8 | 13 |
| Preileal | 2 | 2 | 4 |
| Pelvic | 8 | 6 | 14 |
| Subcaecal | 0 | 2 | 2 |
| Total | 50 | 50 | 100 |

**Table 4:** Statistical comparison of clinical presentation and complication

| | Complicated | Uncomplicated | Total |
|---|---|---|---|
| Typical Presentation | 4 | 23 | 27 |
| Atypical Presentation | 10 | 13 | 23 |
| | 14 | 36 | |

## DISCUSSION:

In Our study we found that Appendicitis was more common in the third decade followed by second decade. Lewis et al (1975)[6] found that the 2nd and 3rd decades were the most common age groups for acute appendicitis. Men outnumbered women. Men are believed to suffer from appendicitis more often because of irregular diet , junk food and probably because they are subjected to more stress and strain. Addis et al (1990)[12]& Korner et al (1957)[13] have also reported a slight male preponderance. There is no increased predisposition of any position to an increased incidence of attack of appendicitis (Table: 3). The position of the appendix and its relation to the clinical presentation and course of appendicitis has been a subject of controversy. Varshney et al[7] have come to the conclusion that the retrocaecal position is less prone to infection may be because of gravity aided drainage of the lumen. Clegg Lamptey et al[14]described retrocaecal position more common than pelvic position and appears less prone to inflammation. Shen GK et al [9], Williamson WA et al has established that the retrocaecal position does not alter the clinical course of appendicitis. Retrocaecal position was more common in our study. Utam kumar paul et al[10] and Geethanjali et al[11] described retrocaecal position to be more common, however, some authors found pelvic position to be more common.

Varshney et al have described that advanced appendicitis (perforation or gangrene) is more common in those with retro-caecal appendicitis. They have given the explanation that early cases might be misdiagnosed as urinary infection, leading to delay in the diagnosis, and increased incidence of complications. In Collins[8] series of 751 patients only 19% had typical symptoms while 53% were perforated. Guidry S et-al[4] concluded that the patients with gangrene and perforation were more likely to have pain and tenderness at a site other than right lower quadrant. Poole GV[5] found that appendix occurs in one of the three sites commonly (retro-caecal, post-ileal, pelvic) and in 69% of the patients it was gangrenous or perforated . Only 5% cases had simple appendicitis.

## CONCLUSIONS:

Appendicitis is slightly more prevalent in males and in third decade of life with retrocaecal position being the commonest. There is no predilection of any position of the appendix to get inflamed. The position of the appendix influences the clinical presentation. Even though most patients experience pain and tenderness in right iliac fossa, depending on the position, patient may experience additional symptoms and signs which frequently results in delayed diagnosis.

In retrocaecal appendix the patient may experience flank pain, tenderness and symptoms of upper urinary tract infection because of its proximity to ureter. In pelvic appendicitis patient may present with suprapubic pain with symptoms mimicking lower urinary or bowel infections. In post ileal position patient may have subtle signs and symptoms or even bowel disturbance. Delay in diagnosis because of atypical presentation leading to increased incidence of life threatening complications which warrant a thorough clinical examination supported by biochemical and radiological investigations till the clinician is convinced that it is not an undiagnosed appendicitis.

## REFERENCES:

1. Wakeley CPG. The position of vermiform appendix is ascertained by the analysis of 10,000 cases, J.Anat 1933 ; 67:277-283.
2. Collins DC . 71,000 human appendix specimens : a final report, summarising 40 years study. Am J Protocol 1963 ; 14 : 365-381.
3. Pickens G, Ellis H. The normal vermiform appendix at C.T visualisation and anatomical location. Clin. Anat 1993 ; 6:9.
4. Guidry SP , Poole GV . The Anatomy of appendicitis. Am Surg 1994 Jan; 60(1): 68-71.
5. Poole GV . Anatomic basis for delayed diagnosis of appendicitis . South med J.1990 Jul; 83(7); 771-773.
6. Lewis FR , Holcroft JW, Boey et-al; Appendicitis ; a critical review of the diagnosis and treatment in 1000 cases. Arch Surg 1975; 110: 677-684.
7. Varshney S , Johnson CD, Rangnekar GV . Retrocaecal appendix appears to be less prone to infection Br, J Surg 1996;83:223-224.
8. Collins DC . Acute retrocaecal appendicitis . Arch Surg 1938; 36:729-743.
9. Shen GK, Wong R, Daller J, Melcer S et-al . Does the retrocaecal position of the vermiform appendix alter the clinical course of acute appendicitis ? Arch Surg 1991; 126: 569-570.
10. Uttam kumar Paul , Humaira Naushaba, Tahmina begum, Md Jahangir Alamq et al . Position of vermiform appendix; A post-mortem study. Bangladesh Journal of Anatomy 2009;7:34-36.
11. Geethanjali HT , Lakshmi Prabha, Subhash. A study of variations in the positions of vermiform appendix. Anatomica Karnatka 2011;5(2):17-23.
12. Addis DG, Shaffer N, Fowler BS, The epidemiology of acute appendicitis in united states. Am J Epidemiol.1990;132:910
13. Korner H, Sondenna K, Soreide JA. Incidence of acute non-perforated and perforated appendicitis : Age specific and sex specific analysis. World J Surg 1997; 21:313.
14. Clegg- Lamptey JN, Armah H, Naaeder SB, Adu-Aryee NA. Position and susceptibility of vermiform appendix in Accra Ghana. East Afr Med J.2006;83(12): 670-3.

**Source of support:** Nil **Conflict of interest:** None declared