VARIATIONS IN THE POSITION OF THE VERMIFORM APPENDIX IN PATIENTS UNDERGOING OPEN APPENDECTOMY AT HAYATABAD MEDICAL COMPLEX, PESHAWAR

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Abstract

Objectives: Due to the diverse anatomical positions of vermiform appendix it is important to know its variations so it helps the surgeons in prompt diagnosis of acute appendicitis and its management. The main purpose of this study was to find out these variations in people belonging to our part of the world mainly Khyber Pakhtunkhwa.

Materials & Methods: This study was of one year duration and carried out at Hayatabad Medical Complex, Peshawar. A total of 212 cases which included male and female both of all ages were included in the study who underwent appendectomy.

Results: Retrocecal position was most commonly seen in 90 cases (42.5 %), followed by pelvic in 64 case (30.2 %), Post- ileal in 16 cases (7.5 %), Pre-ileal in 10 cases (4.7 %), Subcaecal in 10 cases (4.7 %) Right Paracolic in 6 cases (2.8 %) and Retrocolic in 4 cases (1.9 %). It is relevant to know about the appendix position variations during appendectomies.

Conclusion: The findings of this study highlight that variation in the position of vermiform appendix occur in a large number of cases.

Key Words: Paracolic; Position; Anatomy; Subcaecal; Retrocecal

Introduction

The appendix is located in the right iliac fossa and is the part of the gastrointestinal system. It has many variations in terms of its position, its relations to other organs and extent1-3. Knowledge about the variations in the position of vermiform appendix is important because different positions lead to variable signs and symptoms of acute appendicitis and help the surgeon in its diagnosis. It is also important during other intra-abdominal procedures. Vermiform appendix is a wormlike process arising during developmental period from the cecum. It lies about 2cm below the ileocecal valve. In 1924 Gladstone and Wakeley observed its position in 3000 cadavers. Before this it was believed that most of appendixes were anteriorly located and they hung over the brim of the pelvis. Now we know that it arises from the cecum, but its head can be found in six different locations which are pelvic, ectopic, retrocecal, sub-cecal, retroileal and preileal4-6. Having knowledge of appendix position variation is significant because it can help in the diagnosis of appendicitis which has atypical signs and symptoms7-8.

Vermiform appendix is the most diverse structure. It has no definite position and varies in indi-
individuals. The location of the vermiform appendix has evolutionary, pathological and surgical importance. For a prompt acute appendicitis diagnosis, the surgeon should be aware of all the positions of vermiform appendix\textsuperscript{9-10}. In case of retrocaecal appendicitis the characteristic feature is not usually tenderness in the right iliac fossa. A vermiform appendix in the retroperitoneal location may cause pain in the lumbar region. Passive extension of the right thigh may lead to pain which is a positive Psoas sign\textsuperscript{11-13}. When appendix is inflamed and present in pelvic territory, it may elicit tenderness in cul-de-sac instead of abdominal signs. Pain on internal rotation of flexed right thigh which is known as obturator sign may be present. The surgeon demonstrates parietal peritonitis in infra umbilical area and this is very common in kids and young adults\textsuperscript{14-16}. Post ileal appendix also called missed appendix is common. Preileal appendix is reputed to undergo perforation which leads to diffuse peritonitis. Appendix in the right paracolic gutter results in flank pain mimicking acute pyelonephritis. In addition, symptoms similar to acute gastroenteritis may result from chronic irritation. If the inflamed appendix is near the urinary bladder it may produce symptoms of cystitis. When appendix is behind caecum, or behind colon there is a greater incidence of gangrene because these two positions are commonly associated with kinking of their blood supply. Chronic appendicitis when appendix occupies in area below liver is strong differential diagnostic condition and presentation is similar to infection of gallbladder. When appendix is present in a place behind colon and gets inflamed it results in right flank pain. When appendix is found in front of ileum it is more prone to parietal peritonitis\textsuperscript{17}. Current research work was conducted to establish a Pakistani standard of wide spectrum of clinical presentation, related to knowing different anatomical locations of “appendix” and this is crucially important as the ultimate objective is quick diagnosis and to avoid unwanted outcomes. Its importance during other intra-abdominal procedures is also significant. Regarding the position of the appendix there has been reports of ethnic and geographical variations. If any variation is found during surgery, there may arise the need to extend a transverse incision or additional muscle splitting which can lead to complications during the surgery. So, if one is aware of the variations before surgery one can plan accordingly. There is a lack of data on variations of the vermiform appendix even though it is the most common surgery performed in Pakistan. In young patients acute abdomen most common cause is appendicitis\textsuperscript{18}. Exact data about its positions in our part of the world can lead to its prompt diagnosis and prevent unnecessary complications and lead to a decrease in the mortality rate.

There is no definite test to confirm Acute appendicitis and its diagnosis is mainly done by history and physical examination. Prompt diagnosis can be made if one has knowledge of its different positions. If the surgeon is not aware of the variation in its position he can miss its diagnosis or complicate differential diagnosis. Any delay in its diagnosis can lead to increased risk of perforation and other complications like abscess formation and peritonitis. The mortality rate is less than 1% in unperforated appendicitis but it is about 5% if its diagnosis is delayed\textsuperscript{19}. So, the prognosis of the disease can be improved by accurate information about its anatomical location.

The current study was carried out to find the anatomical variations in the position of appendix in people undergoing appendectomies.

**Materials and Methods**

This study was a descriptive review of data from Surgical A ward of Hayatabad Medical Complex, Peshawar where open appendectomies were performed. All patients with indications for appendectomies were included in this study.

**Results**

According to the results, retrocecal position was most commonly seen in 42.5%, followed by pelvic 30.2%, post-ileal 7.5%, pre-ileal 4.7%, subcecal 4.7%, right paracolic 2.8% and retrocecal 1.9%. Retrocecal location was the most common location for both males and females. It was followed by subcecal, retroileal, pelvic, ectopic, and preileal locations respectively. Preileal anatomical position was not observed in female population.

**Discussion**

The most prevalent position of appendix in our study was retrocecal and the least common was retrocecal position. These findings were similar to those of L. Ajmani and K. Ajmani in India\textsuperscript{20}, Ojeifo et al\textsuperscript{21} in Bosnia, and Clegg-Lamptey et al\textsuperscript{22} in Ghana in whose studies retrocecal position was the most common. Other studies have found the pelvic position
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to be the most common. Our findings were different to those of Golalipour et al23, Yubunaka et al24, who found pelvic position to be the most common in both sexes. The variation in position of appendix leads to different presentations of acute appendicitis.

In our study of the 212 cases the appendix was in the pelvic position in 64 cases, in the post ileal position in 16 cases, in the preileal position in 10 cases and in the subcaecal position in 10 cases. It was in the right paracolic gutter in 6 cases and in the retrocolic area in 4 cases.

In both sexes the most common location was the retrocecal position with a frequency of 42.5%.

A study carried out by D. Hegde25 found the appendix to be in a more superomedial position in 75% of cases. The study by Naraynsingh et al26-28, also found similar results. A more caudal location of the appendix was found in other studies such as one carried out by Ramsden et al27. Ethnic variations may have contributed to this difference.

Similar results were seen in an African study from Ghana, in which 67% of patients had appendix

<table>
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<tr>
<th>Position</th>
<th>Total (%)</th>
<th>Pelvic</th>
<th>Post-ileal</th>
<th>Preileal</th>
<th>Subcecal</th>
<th>Right paracolic</th>
<th>Retrocolic</th>
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</thead>
<tbody>
<tr>
<td>Retrocecal</td>
<td>42.5%</td>
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<tr>
<td>Pelvic</td>
<td>30.2%</td>
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<tr>
<td>Post-ileal</td>
<td>7.5%</td>
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<tr>
<td>Preileal</td>
<td>4.7%</td>
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<tr>
<td>Subcecal</td>
<td>4.7%</td>
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<td>Right paracolic</td>
<td>2.8%</td>
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<td>Retrocolic</td>
<td>1.9%</td>
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Table 1: Position of vermiform appendix in studied population

in the retrocecal position2. Another Indian study also found retrocecal position in 68% of cases30. However, pelvic position (43.6%) was common in a study carried out in Zambia31-32. Genetic and lifestyle factors may be the reason for these differences. Our study also revealed that pre ileal position of the appendix was present in 4.7% of cases, post ileal in 7.5% of cases, subcaecal in 4.7% of cases and Retrocolic in 1.9% of cases. Thus, there was significant variation in vermiform appendix position33.

Conclusion

The topography of vermiform appendix in Pakistan shows a great deal of variation. The findings of the present study highlighted the fact that the position of vermiform appendix is variable and the anatomic variations occur in a high percentage of cases. The present study will help in prompt acute appendicitis diagnosis and thus in the prevention of complications like perforations. In our part of the world open appendectomies are common and having information about its variations will lead to better operative outcomes.

References

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