

# Appendicular Diverticulosis with Diverticulitis and Perforation

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## ABSTRACT

Diverticulum of the appendix is rarely encountered. Mostly, it is a pseudo or a false diverticulum. It may suffer either inflammatory complications with or without associated appendicitis or it may rarely be an incidental finding in an inflamed appendix.

Diverticulosis of the appendix cannot be differentiated from acute appendicitis preoperatively and it is usually revealed during a pathological examination

Here, we are reporting a case of a pseudodiverticulum which was clinically diagnosed as acute appendicitis, with a brief review of the literature.

**Key Words:** Diverticulosis, Diverticulitis, Perforation, Vermiform Appendix

## CASE REPORT

An 18 year old male presented with pain in the right iliac fossa, which was associated with vomiting and loose stools, for one day. He had a similar problem one year back.

On examination, the patient was found to be afebrile and his vital status was stable. His abdominal examination revealed tenderness in the right iliac fossa. His haemoglobin was 12.5 gm/dl and his total WBC count was 9500/cmm. The differential count showed a neutrophilic preponderance with 78% neutrophils.

A provisional diagnosis of acute appendicitis was made and an emergency appendectomy was performed.

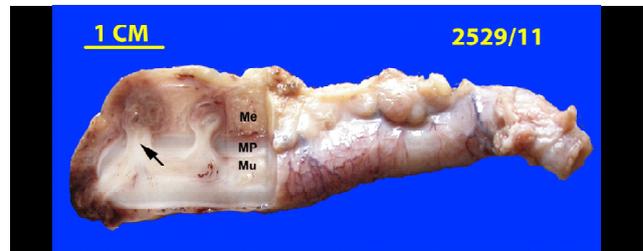
## PEROPERATIVE FINDINGS

The vermiform appendix appeared to be inflamed and it showed perforation in the tip. Extension peritonitis was also present. Pus was present in the right iliac fossa and in the pelvic cavity. The terminal ileum and the pelvic wall were erythematous.

An appendectomy was done and the specimen was sent for a histopathological examination.

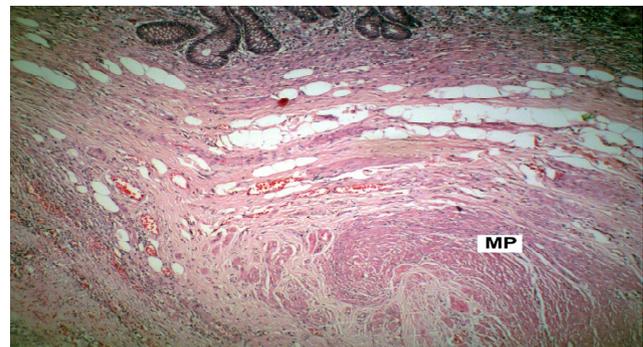
## PATHOLOGICAL FINDINGS

Grossly, the vermiform appendix measured 7cm in length. The serosa was covered with a purulent exudate. The cut section showed three diverticula, one at the tip and the remaining two in the mesenteric border [Table/Fig-1].



**[Table/Fig-1]:** Cut opened vermiform appendix shows herniation (↑) of the mucosa (Mu) through the muscularis propria (MP) in to the mesoappendix (Me). All the diverticula are inflamed. The one in the tip is perforated and appears darker than the other two

A microscopic examination showed the pseudodiverticulum which was formed by the mucosa and the muscularis mucosa to herniate into the muscularis propria and to extend into the mesoappendix. The mucosa of the diverticulum showed ulceration and the features of perforation [Table/Fig-2]. The



**[Table/Fig-2]:** Section of vermiform appendix shows discontinuation of the muscularis propria (MP) through which the submucosa penetrating. H&E, 4x objective

remaining wall of the vermiform appendix appeared to be within normal limits.

The post-operative period was uneventful.

## DISCUSSION

Diverticula of the intestine are of two types, congenital and acquired. The congenital type is rare and it is composed of all the bowel wall layers. It is usually situated in the antimesenteric border. It may be single or multiple. This type was wholly reviewed by Everts-Sanarez [1]. The acquired varieties, the more common type, lack the muscular layer and are found along the mesenteric border. They also may be single or multiple [2].

The most common site of an acquired diverticulum is the sigmoid colon and other less common sites include the oesophagus, stomach and the duodenum [3]. The incidence of a diverticulum in the vermiform appendix is rare, about 0.2 to 2.6 % [4].

The sizes of the diverticula in the appendix range from 0.2 to 0.5cm. They vary from 2 to 6 in number. They commonly involve the distal third followed by the middle third. The proximal third of the appendix is rarely involved [2]. The lumen of the diverticulum may contain faecal material, mucus or even pus, when it is complicated by suppuration. The mucosa of the diverticulum is often atrophied and it may become ulcerated when it is complicated by diverticulitis or when it is replaced by a fibrous shell and when it is complicated by suppuration [5].

The common complications of an appendicular diverticulum include diverticulitis and a perforation which leads on to peritonitis or a pericolic abscess. Rare complications like intestinal obstruction, haemorrhage and fistula formation have been reported in the literature [6]. The percentage of perforation of the appendix which accompanies the diverticula is 16.6% [2]. The perforation was reported to be more frequent in a diverticulum than in appendicitis (Lipton et al).

Based on the coexistence of appendicitis and diverticulitis, the diverticular pathology of the appendix had been classified [Table/Fig-3] in to four morphological types [7, 8].

Type	Vermiform Appendix	Diverticulitis
1	Normal	Present
2	Appendicitis	Present
3	Appendicitis	Normal
4	Normal	Normal

[Table/Fig-3]: Coexistence of appendicitis and diverticulitis.

The pathogenesis of an appendicular diverticulum has not been completely understood. Several theories have been proposed and some are contradictory. Diverticula of the appendix have been reported in conjunction with a mucocele [2, 6]. In these cases, the increased intraluminal pressure was thought to cause a herniation of the mucous membrane through the muscle coat at the weak points.

To understand the mechanism of herniation of the mucosa, the appendix can be considered to be a structure which is composed of two concentric tubes: the inner tube (the mucosa and the sub mucosal layers) and the outer tube (the muscular and the serosal layers). Contraction of the muscular layer would cause the inner tube too long to herniate through the weak points, such as an abnormally widened vascular cleft in the muscular layer. Some authors [7, 9] have suggested that other than the vascular cleft, the site of weakness in the muscular layer would result from a past episode of appendicitis. Hence, recurrent appendicitis and cystic fibrosis are considered as the risk factors for pseudodiverticulosis. In the literature [8, 10], the male gender and age above 30 years were also described as the risk factors for pseudodiverticulum of the appendix.

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