

## Duplicated Appendix, a Challenge Diagnosis: About 2 Cases Report

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### Abstract

### Case Report

**Introduction:** Appendix duplication is an extremely rare congenital anomaly that is seen in 0.004% to 0.009% of appendectomy specimens. Even though the abnormality is rare, it is essential to make the diagnosis. **Cases report:** the first patient is a child of 07 years- old admitted for acute abdomen, The diagnosis of acute generalized peritonitis was retained with clinical and ultrasound arguments, a midline laparotomy showed 2 appendices in different position. The second was 14years old boy, presented to our department with appendicular syndrome, Mac Burney incision found duplicated appendix. **Discussion:** Preoperative diagnosis of a duplicated appendix is not easy at all for the surgeons and radiologists. Awareness of the Cave-Wallbridge classification system may assist surgeons in diagnosing appendiceal duplication, especially the type B duplication which presents the largest risk of misdiagnosis and may result in serious adverse patient outcomes and medicolegal consequences. **Conclusion:** Appendiceal duplication although rare and difficult to diagnose preoperatively, should be checked while operating for appendicular pathology in order to avoid serious clinical and medicolegal implication.

**Keywords:** Duplicated- appendix- diagnosis- complications.

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## INTRODUCTION

Appendix duplication is an extremely rare congenital anomaly that is seen in 0.004% to 0.009% of appendectomy specimens [1]. Bartels was the first to describe a double appendix in a foetal specimen in 1867, but Picoli published the first clinical report in 1892. More than a hundred cases and several variations have since been described [2].

When appendiceal duplications are detected in childhood, almost all patients have serious associated intestinal, genitourinary or vertebral malformations [3, 4]. These anomalies are mostly associated with types B1 and C duplications [3, 5].

Even though the abnormality is rare, the complications that might arise from an unidentified duplicate appendix may have serious, life-threatening consequences for the patient [1].

## CASES REPORT

### Case report 1

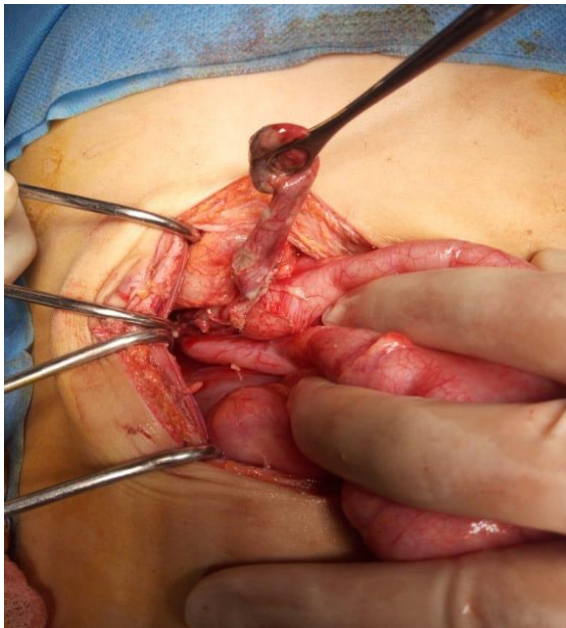
This is a 7 years-old boy presented to emergency department with 2 days history of abdominal pain, bilious vomiting and fever.

At the time of admission the clinical examination found altered general condition, tachycardia with heart rate of 100 per minute, blood pressure of 10/6 the abdominal examination found generalized defense.

Laboratory study results showed a leukocyte count of 19000/mm<sup>3</sup>, hyponatremia of 131meq/l. The X-Rays showed no abnormalities, ultrasound demonstrated a abdominal effusion with intense infiltration at the right lower quadrant, an appendix was not visualized. The diagnosis of complicated appendicitis was suggested.

After fluid resuscitation and intravenous antibiotics, he was taken to operating theater. A midline laparotomy was performed. The operative finding was a peritoneal abscess with duplicated appendix, the first arose from the cecum in the typical anatomy position, perforated and had intraluminal fecolith.

The second was in retrocecal position, appeared macroscopically normal (Fig1). Both appendices were removed. Histologic examination confirmed duplicated appendix type B.



**Fig-1: Duplicated appendix type B**

**Case report 2**

This is a 14 years – old boy presented in our department with a week history of abdominal pain located in the right lower quadrant and vomiting.

On examination, the patient was febrile and had a rebound tenderness at Mac Burney s point. Laboratory blood test were normal apart leukocyte count of 17000/mm<sup>3</sup>. Abdominal Ultrasound found fleghmonous appendix with peri appendicular infiltration.

The patient was taken to the operating room, where exposition of the cecum, showed a large abscess containing a perfored and necrotic retrocecal appendix, associated with second appendix in a posterior band of cecum, was inflamed (Fig 2).



**Fig-2: Exposed cecum with duplicated appendix**

Therefore, both appendix were removed; and duplicated appendix were confirmed with histologic examination. His post operative recovery was uneventful and he was discharged after 4 days.

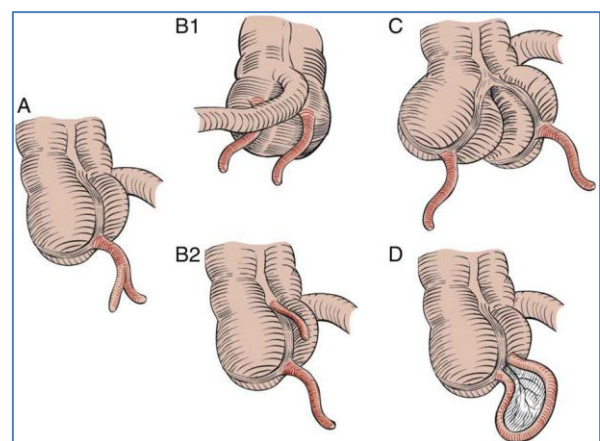
**DISCUSSION**

Duplicated appendix is an uncommon entity, typically discovered as an incidental finding during surgery for appendicitis or other abdominal pathologies [5]. Different theories about the embryological origin of appendicular duplication have been ascribed for the subtypes.

Most authors agree that Type B2 duplication may be the remnant of a “transient appendix” which appears during the sixth and seventh week of embryological development, the presence of which was first reported by Kelly and Hurdon. Gladstone also found the presence of a transient appendix in embryos between the sizes of 10 and 20 mm. Type B1 duplication has been attributed to the failure of proper differentiation of the cloaca and Type C to the partial twinning of hindgut structures [2].

**Classification**

Appendiceal duplications were first classified by Cave in 1936 by their anatomical location; this was updated and modified in 1963 by Wallbridge. Although several other authors have added further modifications to the classification, it remains known as the Cave–Wallbridge classification [6] (fig 3).



**Fig-3 Cave-Wallbridge classification system [7]**

The most common cause of right lower quadrant pain, fever and leukocytosis is appendicitis. If a patient presenting with this clinical scenario has a history of appendectomy, the possibilities of stump appendicitis and recurrent appendicitis secondary to appendiceal duplication should be considered [8]. The diagnosis of appendix duplication is only confirmed when both specimens display an intact structure (including the tip) with lumens that are lined by normal appendiceal mucosa, lymphoid follicles and two layers of musculature on histological examination [2].

Preoperative diagnosis of a duplicated appendix is not easy at all for the surgeons and radiologists. Routine radiological imaging studies like ultrasonography and computerized tomography (CT) cannot distinguish this abnormal duplication of intestines from other pathologic lesions [9].

Duplication of the appendix must be distinguished from solitary diverticulum of the cecum, and from appendiceal diverticulosis [4, 9].

This distinction can be best made histopathologically. Besides duplication and diverticulosis, the horse-shoe and triple appendix anomalies should be considered in the differential diagnosis [4].

The potential complications of a ruptured second appendix could lead to generalized peritonitis if the body's innate walling-off process does not contain the rupture. Like the case of our first patient. Surgeons performing an appendectomy should maintain a high degree of suspicion of a duplicate appendix. The cecum should be visually inspected routinely to ensure that there are no appendiceal anomalies. In the present case study, inspection of the cecum during the first appendectomy could have prevented a second surgery and the subsequent hospitalization [1].

All these anomalies are of great practical importance and a surgeon must bear them in mind during an operation. If he overlooks them, the operated patient may experience serious consequences, which may be of legal importance in cases where repeated exploratory laparotomy reveals a 'previously removed' vermiform appendix.

We also believe that junior surgical staff must be aware of these conditions due to the medicolegal aspects [4]. Awareness of the Cave-Wallbridge classification system may assist surgeons in diagnosing appendiceal duplication, especially the type B duplication which presents the largest risk of misdiagnosis and may result in serious adverse patient outcomes and medicolegal consequences [7].

A careful examination of the cecal pole should be performed, and the retrocecal space should be explored for appendiceal malformations [10].

## CONCLUSION

Appendiceal duplication although rare and difficult to diagnose preoperatively, should be checked while operating for appendicular pathology in order to avoid serious clinical and medicolegal implications [11]. Misdiagnosis and mismanagement are common occurrences in such cases because of the rarity of the

diagnosis. Delays in diagnosing a second appendix may lead to increased risk of perforation [1]. Although infrequent represents, without doubt, a challenging clinical scenario in cases of right lower quadrant pain. Life threatening consequences with legal extensions can arise from the incomplete removal of both stumps [12].

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