Mucocele of the Appendix: Diagnosis, Management, and the Importance of Timely Surgical Intervention

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Abstract:

Background and Aim: Appendiceal mucocele is a rare condition that may result in complications, including rupture and malignancy.

Case Report: A 69-year-old patient was referred to the computed tomography (CT) unit due to the presence of a dilated mass. Imaging confirmed the diagnosis of a mucocele. A laparotomy was performed, and the cystic mass was removed without any signs of inflammation or malignancy. Histopathological analysis confirmed the presence of an appendiceal mucocele.

Conclusion: This study underscores the importance of timely diagnosis and appropriate management of appendiceal mucocele to prevent serious complications. It also highlights the need for increased awareness among physicians about this rare condition.

Keywords: Appendix; Mucocele; Tomography, X-Ray Computed

Background and Objective

Mucus accumulation in the body's tissues is known as a mucocele, which can also occur in the appendix. The mucocele of the appendix was first described by Rokitansky in 1842.[1] This condition is a rare anomaly caused by appendiceal obstruction, leading to the accumulation of mucus within the appendix.2-4 Mucocele of the appendix can manifest in two forms: retention and extravasation. In the extravasation type, damage to the mucous gland ducts leads to mucus accumulation and subsequent enlargement of the appendix. In contrast, the retention type results from obstruction

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caused by scarring, calculi, or fecal material, leading to mucus accumulation within the appendix. Histopathological features include thinning of the appendix wall and the presence of epithelial cells with mucus accumulation. Conditions such as chronic appendicitis, endometriosis, and parasitic infections can also increase the risk of developing a mucocele. The symptoms of appendiceal mucocele are usually similar to those of acute appendicitis; however, in some cases, it is diagnosed incidentally without any clinical symptoms.2,5 Diagnosis is typically made through ultrasound or abdominal and pelvic computed tomography (CT) scans. The prevalence of this condition is approximately 0.2-0.3% in appendectomy cases, and it is more common in middle-aged individuals. Treatment generally involves an appendectomy to prevent serious complications, including appendiceal rupture. If left untreated, the condition can lead to a severe complication known as pseudomyxoma peritonei, in which mucin spreads throughout the abdominal cavity, causing peritoneal inflammation.3,6

Case Report

A 69-year-old female patient with no underlying medical conditions, such as neurological or cardiovascular diseases, diabetes, or previous surgeries, presented to the ultrasound unit. She had a four-year history of chronic cholecystitis (biliary sludge) and, following her gastroenterologist's recommendation, underwent abdominal and pelvic ultrasounds every six months to monitor her gallbladder. During the ultrasound examination, the radiologist identified a dilated mass measuring 42×81 mm without echogenicity in the lower right quadrant of the abdomen. To further assess and rule out issues in the pelvic region, particularly involving the urinary and reproductive systems, a transvaginal ultrasound was performed. This confirmed the presence of a cystic mass and its lack of connection to the urinary or reproductive systems. Based on these initial findings and the radiologist's recommendation, a contrast-enhanced CT scan was subsequently performed.

The CT scan report indicated that the appendix was dilated, measuring approximately 28 mm in diameter. However, the wall thickness was within normal limits, and no significant inflammation was observed adjacent to the appendix. These findings were consistent with an appendiceal mucocele. An appendectomy and pathological examination were recommended to determine its etiology. There were no clear signs of malignancy in the appendix based on the CT scan resolution. Additionally, no significant mucin accumulation or free fluid was detected in other areas of the abdomen and pelvis. The intestinal loops showed no significant pathological findings, and no pathologically significant para-aortic lymphadenopathy was noted.

The patient was referred to the surgeon due to the risk of rupture and potential complications associated with the mucocele. Clinically, the patient reported no abdominal pain prior to surgery, and the surgeon’s physical examination revealed no abnormal or hard masses. Furthermore, preoperative laboratory tests showed no signs of neutrophilia or leukocytosis (Figure 1).

A laparotomy was performed using an appropriate incision (McBurney's incision). A cystic mass filled with mucus, non-inflammatory and connected to the cecum, measuring 35×110 mm, was identified and removed. No adenopathy (enlarged lymph nodes) was observed in the mesoappendix. Histopathological results confirmed the diagnosis of appendiceal mucocele, with no signs of inflammation or malignancy (Figure 2).

The patient experienced an uncomplicated recovery following surgery, and follow-up examinations confirmed no signs of complications or disease recurrence. This case highlights the importance of timely diagnosis and appropriate management of appendiceal mucocele to prevent serious complications.

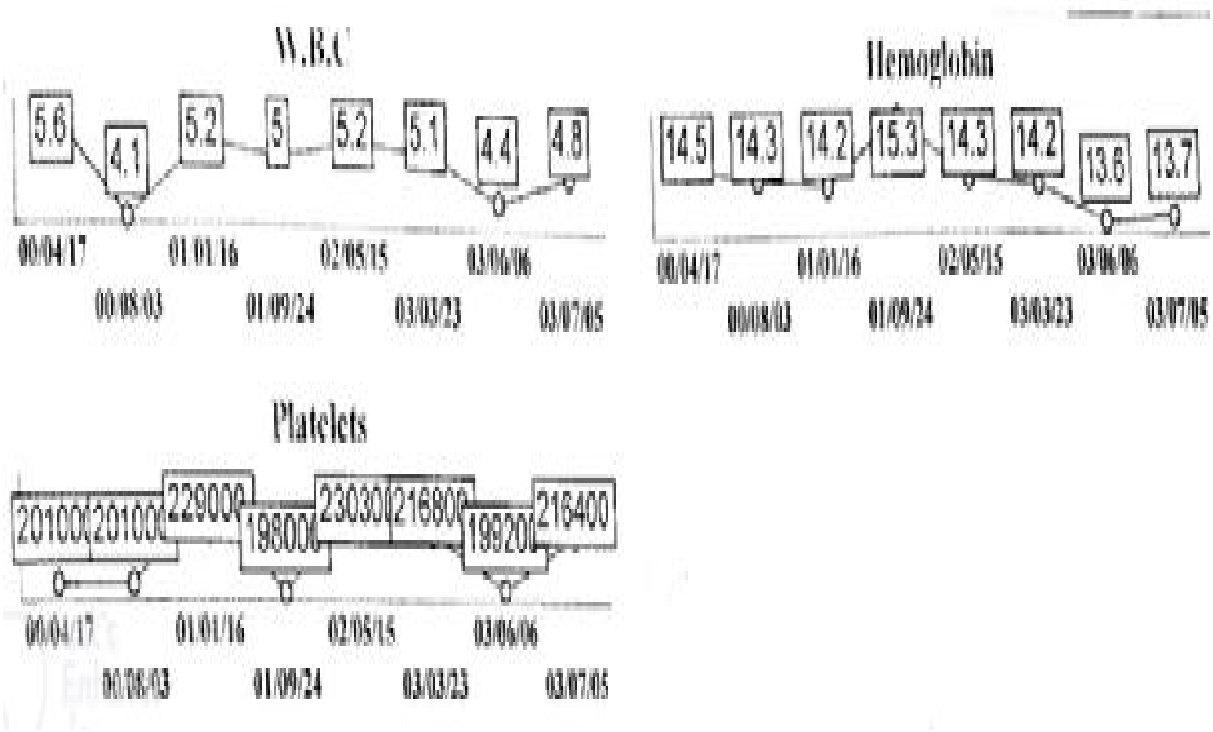
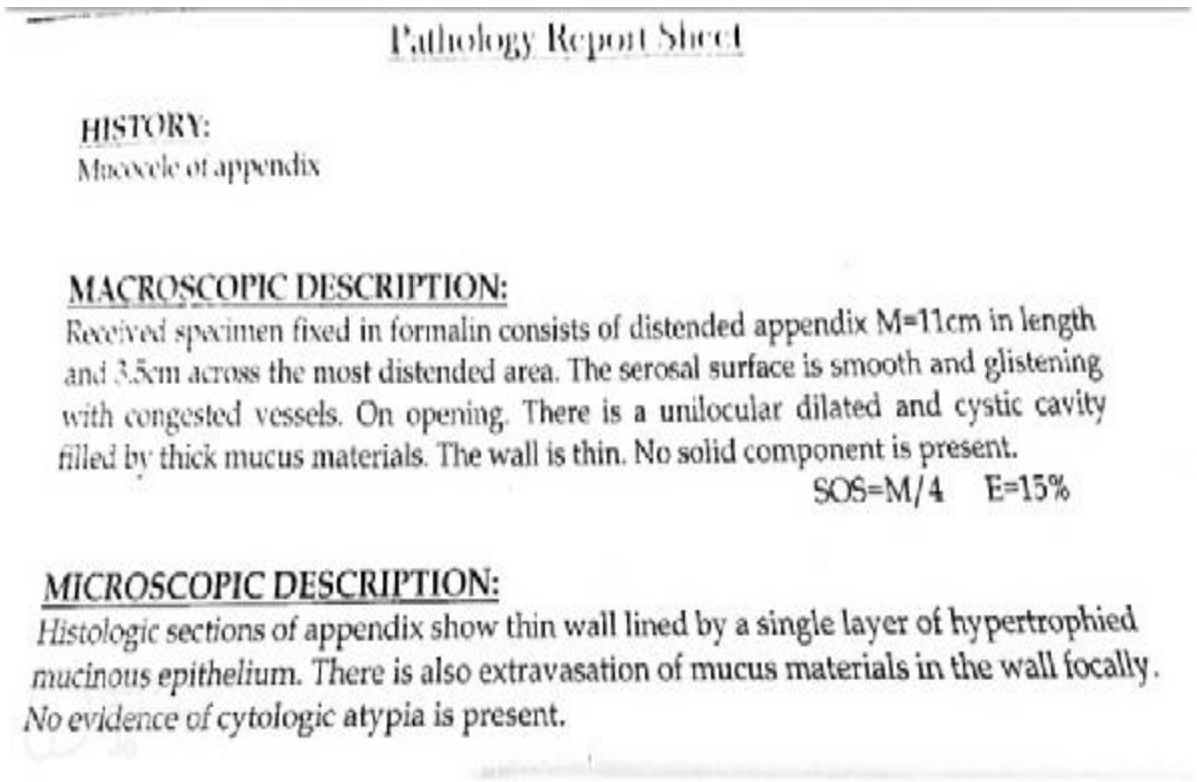


Figure 1: The patient's test results from the past few years show no leukocytosis or polyneutrophilia



Pathology Report Sheet

HISTORY:
Mucocele of appendix

MACROSCOPIC DESCRIPTION:
Received specimen fixed in formalin consists of distended appendix M=11cm in length and 3.5cm across the most distended area. The serosal surface is smooth and glistening with congested vessels. On opening. There is a unilocular dilated and cystic cavity filled by thick mucus materials. The wall is thin. No solid component is present.
SOS=M/4 E=15%

MICROSCOPIC DESCRIPTION:
Histologic sections of appendix show thin wall lined by a single layer of hypertrophied mucinous epithelium. There is also extravasation of mucus materials in the wall focally. No evidence of cytologic atypia is present.

Figure 2: Post-Surgical Pathology Report

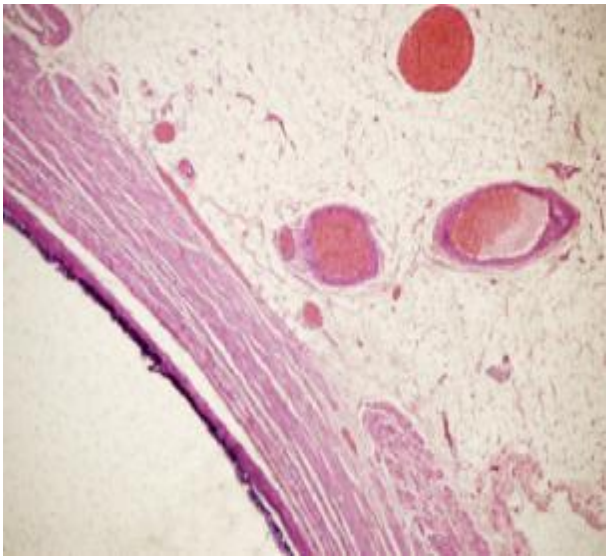


Figure 4. Cross-section demonstrating mucin-filled mucinous glands. Scale bar=2 mm.

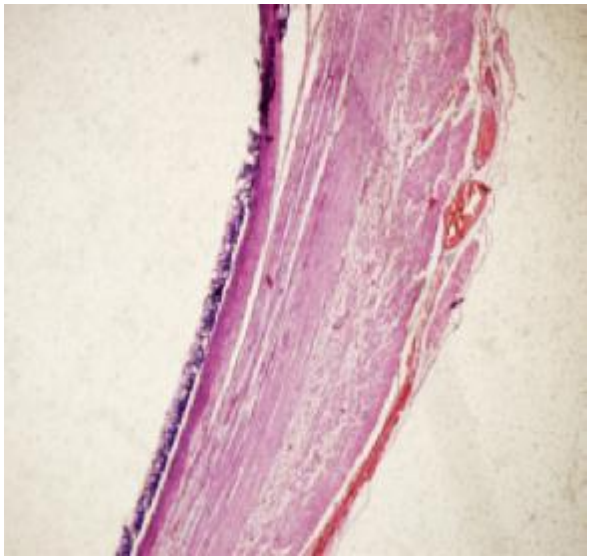


Figure 3. Histological images of an appendiceal mucocele. Longitudinal section of the appendix showing normal tissue architecture.

Discussion

Appendiceal mucocele is a rare condition characterized by the abnormal accumulation of mucus in the appendix, which gradually leads to cystic dilation of the appendix. In most cases, mucus accumulation is non-inflammatory and can result from caused by either neoplastic or non-neoplastic factors. Neoplastic causes include mucosal hyperplasia, mucinous cystadenoma, and mucinous cystadenocarcinoma. Mucinous cystadenoma is a benign tumor characterized histopathologically by enlarged larger epithelial cells and nuclei, which contribute to the thickening of the appendix wall.

On the other hand, mucinous adenocarcinoma, a type of malignancy, contains cells with large, abnormal, hyperchromatic, and irregular nuclei. Due to their invasive nature, these cells can infiltrate the deeper layers of the appendiceal tissue and may even involve surrounding tissues such as the cecum. In some cases, mucus leakage from the appendix into the peritoneal cavity can occur, leading to pseudomyxoma peritonei.2,7,8

Non-neoplastic causes of appendiceal mucocele are generally attributed to inflammation and obstruction. This condition may be asymptomatic or present with nonspecific abdominal symptoms. According to statistics, more than 50% of appendiceal mucocele cases are diagnosed incidentally during radiological examinations such as CT scans or abdominal and pelvic ultrasounds. Patients may report clinical symptoms including pain in the lower right abdomen, periumbilical pain, a firm and palpable mass in the lower right abdomen, signs of bowel invagination, nausea, vomiting, loss of appetite, and weight loss.9,10

Colonoscopy, ultrasound, and CT scans are primary methods used to differentiate between acute appendicitis and appendiceal mucocele. Among these, contrast-enhanced CT scans are considered the most accurate diagnostic method. This technique effectively demonstrates the size and characteristics of appendiceal mucocele, facilitating its diagnosis. During

colonoscopy, obstruction of the appendiceal orifice and internal secretions can be observed, while ultrasound provides information on the external dimensions of the appendiceal mass, aiding in distinguishing between acute appendicitis and appendiceal mucocoele.[11,12]

Accurate diagnosis of appendiceal mucocele is essential for selecting the appropriate surgical approach prior to the operation. Laparotomy is the preferred surgical method, as it helps prevent rupture of the appendix and the subsequent spread of mucus into the peritoneal cavity, which can lead to pseudomyxoma peritonei. Treatment of pseudomyxoma is complex, prolonged, and generally associated with lower patient satisfaction. A thorough examination, including direct visualization and palpation of the lesion site, aids in assessing the degree of mucinous malignancy or inflammation. When choosing the surgical procedure, surgeons consider several factors, including the condition of the mucocele (intact or ruptured), the need to preserve or remove the base of the appendix, and the presence of adenopathy in the mesoappendix and ileocecal valve.6,13,14 In this particular case, given the absence of malignancy and inflammation, negative lymph nodes, and no rupture of the mucocele, the decision was made to proceed with an appendectomy.

Conclusion

This article emphasizes the importance of carefully examining incidental findings in imaging studies. It also demonstrates successful management of appendiceal mucocele through timely surgical intervention, leading to favorable outcomes. Increased awareness and vigilance in diagnosing such conditions can help prevent potential complications related to neglected abdominal anomalies.

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