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CASE PRESENTATION

Benign Appendiceal Mucocele: Safe Surgical Management. A Case Report and Literature Review

Yanet Villafaña-Girón[1], Yoinel Pérez-Sardiña[1], Lilianny María Hidalgo-Ruiz[1], Julio Michel Arias-Manganelly[1]

[1]Universidad de Ciencias Médicas de Camagüey. Hospital Provincial Clínico Quirúrgico Docente Amalia Simoni. Camagüey. Cuba.

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ABSTRACT

Introduction: appendiceal mucocele is a rare entity, present in 0,2–0,7 % of appendectomies, and frequently mimics acute appendicitis.
Objective: to present a case of appendiceal mucocele with initial ultrasound diagnosis.
Case Presentation: a 53-year-old male patient presented with 72 hours of right iliac fossa pain, leukocytosis (14,500/µL), and abdominal ultrasound revealing a non-compressible cystic structure adjacent to the cecum. Exploratory laparotomy identified a dilated appendix with mucinous content, without signs of malignancy. Conventional appendectomy was performed, and histopathology confirmed a benign appendiceal mucocele (mucinous adenoma, CK20+). This case highlights the usefulness of ultrasound as a first-line diagnostic tool in resource-limited settings, showing 85 % sensitivity; the safety of open surgical approach; and the need for annual ultrasound follow-up, given the possibility of recurrence or malignant transformation.
Conclusions: appendiceal mucocele requires a high index of suspicion based on atypical clinical and imaging findings. Multidisciplinary correlation among surgeon, radiologist, and pathologist is essential for optimal management.

Keywords: Appendix; Appendectomy; Mucocele; Appendiceal Neoplasms.

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INTRODUCTION

Appendiceal mucocele (AM) is a cystic dilation of the appendix secondary to mucin accumulation, associated with luminal obstruction (20 %) or mucinous neoplasms (80 %), ranging from adenomas to cystadenocarcinomas.[1] It was first described in 1842 by Karl Freiherr von Rokitansky and later defined by Feren in 1976. Although its incidence is low (0,2–0,7 % of appendectomies), its clinical relevance lies in the risk of rupture (20 % of cases) and the development of pseudomyxoma peritonei. [2,3]

Although the diagnostic standard is computed tomography (CT), in resource-limited settings abdominal ultrasound plays a crucial role, with a reported specificity of 89 % when mural calcifications and anechoic content are identified. According to the Peritoneal Surface Oncology Group International (PSOGI), these lesions are classified as low-grade or high-grade, adenomas, or adenocarcinomas. Appendectomy is sufficient for confined, low-grade lesions, whereas high-grade or extensive lesions require right hemicolectomy. [3,4]

This article aims to present a case of AM with an initial ultrasound diagnosis despite clinical features mimicking acute appendicitis, successfully managed with a conventional surgical approach. It analyzes: imaging criteria to suspect AM in the absence of CT, technical modifications to prevent intraoperative rupture, and recent evidence-based follow-up recommendations.

CASE REPORT

A 53-year-old male, smoking 20 cigarettes daily for 20 years with no other medical history, presented to the emergency department with 72 hours of right iliac fossa (RIF) pain without migration, four episodes of vomiting of gastric contents, and three febrile spikes up to 38,2°C. Physical examination revealed tenderness in the right lower abdominal quadrant with peritoneal irritation, abdominal guarding, positive Blumberg sign, and no palpable masses.

Laboratory tests showed leukocytosis of 14,500 × 10^9/L with neutrophilia; the remainder of the blood chemistry panel was unremarkable. Abdominal ultrasound (Fig. 1) reported a non-compressible tubular structure adjacent to the colon, measuring 6,7 × 5,5 cm, with anechoic content, thin walls (2,1 mm), punctate calcifications at the proximal pole, and no Doppler vascularization—findings suggestive of appendiceal mucocele.

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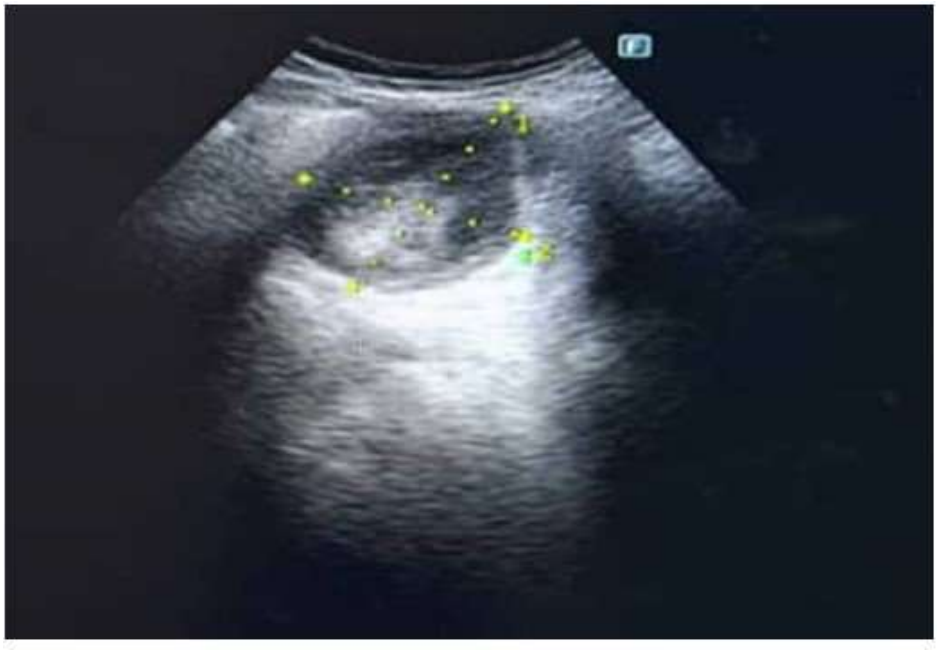

Fig. 1 Abdominal ultrasound.

The patient underwent emergency surgery via an 8,0 cm infraumbilical paramedian laparotomy. A dilated cecal appendix (4,5 cm) with translucent walls and mucinous content was identified (Fig. 2), with no peritoneal infiltration or ileocecal lymphadenopathy. Primary ligation of the appendiceal base was performed using 0 polyester suture, with minimal mesoappendix dissection and no direct puncture or manipulation of the mucocele. The specimen was extracted in a sterile bag to prevent peritoneal seeding. Surgical time was 55 minutes, with no intraoperative complications. The patient had an uneventful clinical course and was discharged on postoperative day five.

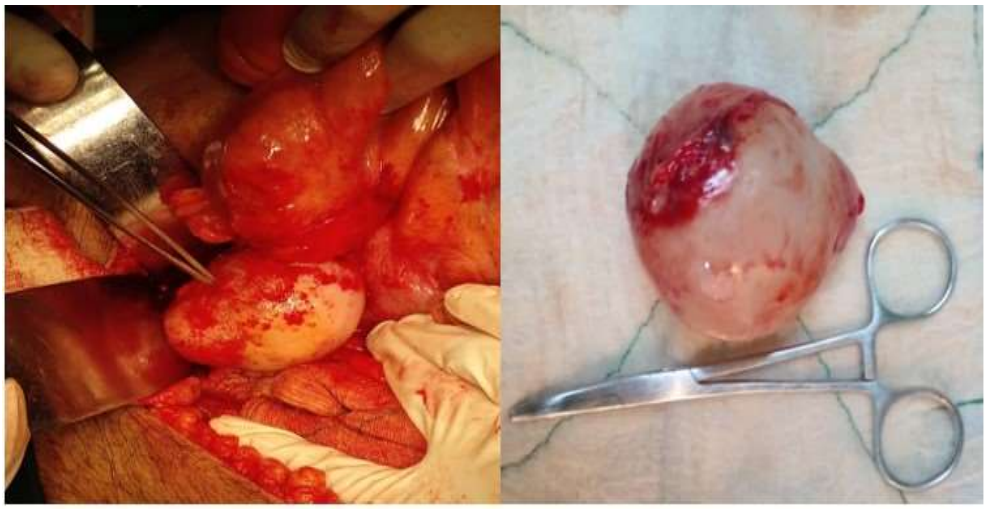

Fig. 2. Visualization of dilated cecal appendix.

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Histopathological examination of the surgical specimen showed, macroscopically: a 6 × 5 cm cystic mass with mucinous content. Microscopically: mucinous adenoma with tumor-free margins greater than 5 mm and no atypia. Immunohistochemistry: CK20+, CDX2+, CK7–.

DISCUSSION

This case illustrates that appendiceal mucocele (AM) should be considered in patients presenting with atypical clinical features suggestive of acute appendicitis. AM is typically nonspecific or asymptomatic and is incidentally discovered during surgery or imaging studies in up to 50 % of cases. The remainder may present clinically with right iliac fossa pain mimicking acute appendicitis or as an abdominal mass in that region.[1,2,3]

Between 10 % and 15 % of AM cases progress to pseudomyxoma peritonei, which occurs when the cecal appendix ruptures spontaneously or during surgical manipulation, spilling its mucinous content into the peritoneal cavity—a complication that drastically alters disease progression and treatment outcomes. Hence, preoperative diagnosis and proactive surgical management are critical to prevent complications.[1]

Ultrasound can accurately identify AM when three key findings are present: a non-compressible cystic structure (92 % sensitivity), mural calcifications (89 % positive predictive value), and homogeneous anechoic content.[5,6] Contrast-enhanced CT is the gold standard (83 % sensitivity), with pathognomonic signs such as the "eggshell" calcification and absence of periappendiceal hyperemia. In Cuba, where 24-hour CT access is not available in all provincial hospitals, ultrasound becomes especially relevant.

In resource-limited settings, laparotomy remains a safe option for AM, provided basic oncologic principles are observed.[7,8] We propose three technical modifications to reduce rupture risk compared to traditional techniques:

1. Primary ligation of the appendiceal base before handling the mucocele. [9]
2. Use of a sterile retrieval bag for safe, intact extraction—proven effective in rural surgery.[10]
3. Intraoperative assessment of margins through systematic palpation of ileocecal lymph nodes and the cecal surface. Systematic lymph node palpation detects occult metastases in 5–7 % of benign AM cases. [11]

This case demonstrates that, even without laparoscopy, adherence to these steps prevented mucocele rupture. Although the lesion was benign, 10–20 % of AMs harbor malignant potential.[10] Most guidelines recommend annual abdominal CT for three years in cases of mucinous adenoma, and referral to oncology if CK7+ (associated with adenocarcinoma).[11]

Cuba currently lacks national guidelines for AM follow-up. We propose adopting protocols based on the National Comprehensive Cancer Network (NCCN). [12] For local, resource-adapted follow-up, we recommend:

- Abdominal ultrasound every 6 months (85 % sensitivity for detecting recurrence) [5]
- Oncology referral if growth is observed during surveillance, ascites develops, or tumor markers rise (CEA >5 ng/mL)

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CONCLUSIONS

Appendiceal mucocele may clinically mimic acute appendicitis, necessitating a high index of suspicion based on atypical clinical, ultrasonographic, or tomographic findings. Early recognition of suggestive signs—such as a dilated cystic structure, thin walls, and absence of marked inflammatory features—is essential to prevent complications and guide appropriate surgical management. In this context, close and continuous collaboration among surgeon, radiologist, and pathologist is indispensable, enabling integration of clinical, imaging, and histopathological data to establish an accurate diagnosis and select the safest therapeutic strategy—minimizing risks of perforation, mucinous dissemination, and progression to pseudomyxoma peritonei.

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