



# Aymand's Hernia Accompanied by Appendix Mucocele

## Apendiks Mukoselinin Eşlik Ettiği Aymand Hernisi

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### ABSTRACT

Appendiceal mucocele is a rare pathology involving distention of the appendix due to mucus accumulation. Treatment consists of appendectomy as well as right hemicolectomy in patients with signs or suspicion of malignancy. Aymand hernia is a rare inguinal hernia in which the appendix is located within the inguinal canal. Simultaneous appendectomy and hernia repair using prosthetic mesh is recommended. Aymand hernia is rarely seen together with appendix mucocele. Herein we report a patient scheduled for repair surgery for incarcerated hernia in whom appendiceal mucocele was detected in preoperative examinations, and we discuss the case in light of the literature.

**Keywords:** Appendiceal mucocele, Aymand's hernia, appendectomy

### ÖZ

Apendiks mukoseli nadir görülen ve apendiks lümeninde mukus birikmesi sonucunda gelişen apendiks patolojisidir. Tedavisinde apendektomi ve malignite bulguları ve şüphesi durumunda sağ hemikolektomi yapılmaktadır. Aymand hernisi herni kesesi içerisinde apendiks bulunduğunda nadir görülen inguinal hernidir. Eş zamanlı apendektomi ve prostetik meş ile onarım önerilmektedir. Aymand hernisi ile birlikte apendiks mukoseli nadir görülmektedir. Bu yazımızda inkarsere inguinal herni nedeniyle onarım ameliyatı planlanan ve yapılan tetkiklerinde apendiks mukoseli görülen bir olgumuzu sunduk ve literatür bilgilerini irdeledik.

**Anahtar Kelimeler:** Apendiks mukoseli, Aymand hernisi, apendektomi

## Introduction

Appendiceal mucocele is a cystic mass that develops as a result of mucus accumulation in the lumen of the appendix. Although they only occur at a rate of 0.2-0.7%, rupture of an appendiceal mucocele can lead to pseudomyxoma peritonei, which is associated with high mortality.<sup>1</sup> Therefore, diagnosis and treatment of appendiceal mucocele is important. It may cause similar symptoms as acute appendicitis, but approximately 50% of cases are detected incidentally during laparotomy for different causes.<sup>2</sup> Treatment requires appendectomy. Open laparotomy/appendectomy is recommended due to the possibility of rupture. However, laparoscopic resection has also been recommended in recent years. Aymand hernia is a rare condition in which the appendix is in the inguinal canal, and is seen in about 1% of inguinal hernias. Naturally, in such a case it is possible,

though rare, to develop appendiceal mucocele in the inguinal canal. In this article, we present a patient scheduled for graft repair surgery due to an existing inguinal hernia in whom appendiceal mucocele was detected on closer examination, and review the relevant literature.

## Case Report

A 54-year-old female patient presented to a tertiary center due to pain in the right groin starting 3 months earlier. A non-reducible swelling of 3-4 cm had been observed in the patient's lateral right inguinal region. The patient had been diagnosed with inguinal hernia, and graft repair surgery had been advised. The patient did not consent to the procedure at that time, but later presented to our clinic for surgery due to increasing pain. On repeated physical examination, a non-reducible swelling 3 cm in diameter was noted in the right



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inguinal region. Superficial ultrasound revealed that the non-reducible swelling had viscous properties. Considering the possibility of lymphocele, the patient was examined using magnetic resonance imaging (MRI). MRI showed a 3x8 cm cystic mass believed to be an appendiceal mucocele that extended from the cecum toward the right inguinal canal, passed through the internal ring, and continued along the inguinal canal (Figure 1). Surgery was planned based on this finding. During the operation, the appendiceal mucocele was found extending into the right inguinal canal through the internal ring but was easily retracted with traction. Appendectomy and inguinal hernia repair with graft were performed (Figure 2). No postoperative complications were observed and the patient was discharged after 2 days. Pathology revealed that the appendiceal mucocele was a low-grade appendiceal mucinous neoplasm.

Informed consent was obtained from the patient.

## Discussion

Appendiceal mucocele develops as a result of obstruction of the appendix due to fecalitis or inflammation followed by accumulation of mucus in the lumen and cystic distention of the appendix. In rare cases, this leads to a neoplastic process.<sup>2</sup> Although the issue of diagnosis and classification continues to be debated in the literature, a new diagnosis/classification was proposed following a Delphi consensus.

It is argued that the term “cystadenoma” be eliminated as a descriptive term related to the appendix. The term “low-grade appendiceal mucinous neoplasm” was recommended for mucinous neoplasm with low-grade cellular atypia and “high-grade appendiceal mucinous neoplasm” for cases with similar features but high-grade cellular atypia. Mucinous adenocarcinoma was defined as a mucinous tumor with infiltrative invasion.<sup>3</sup> According to these definitions, our case was low-grade appendiceal mucinous neoplasm. Appendiceal mucocele can be seen in adults of ages, but is more common in patients over 50 years old. It is seen in approximately 0.1-0.3% of patients who undergo appendectomy. The female to male ratio is 4:1.<sup>4</sup> There are no specific symptoms, but it may cause complaints such as acute appendicitis, a palpable mass in the right lower quadrant, and mild to moderate abdominal pain.<sup>5</sup> Around 50% are completely asymptomatic and are detected after making laparotomies for other purposes. Our patient was 54 years old, female, and presented with complaints of a mass in the right groin. Abdominal ultrasonography, lower abdominal tomography, and lower abdominal MRI are used for radiologic evaluation. In many cases, appendiceal mucocele are noticed incidentally during imaging performed for different reasons. They appear as cystic and aperistaltic cystic masses adjacent to the cecum and ileocecal region, and are suspected upon findings of contrast enhancement of the cyst wall on MRI.<sup>6</sup> However, a definitive diagnosis is ultimately based on pathology results following appendectomy. Observation of implants in adjacent

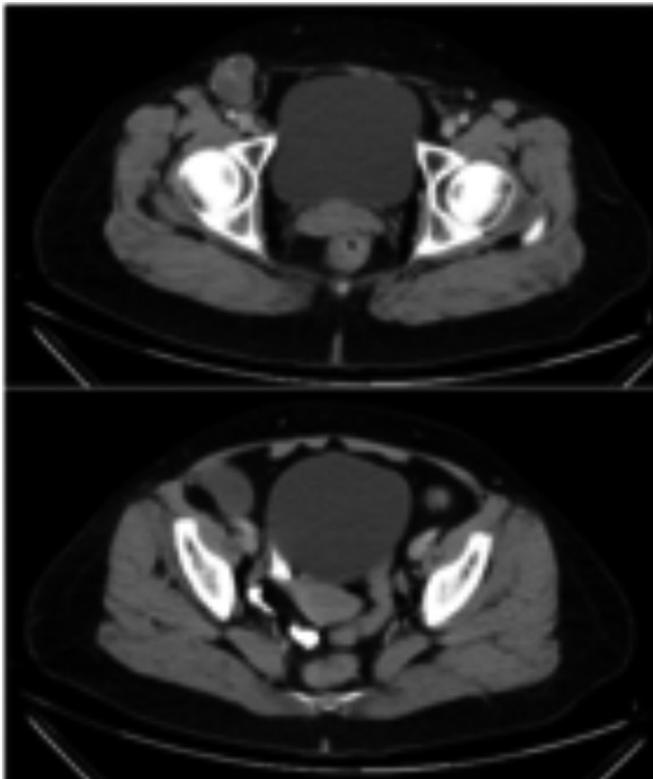


Figure 1. Appendiceal mucocele extending into the inguinal canal



Figure 2. Intraoperative image of appendiceal mucocele

peritoneal surfaces conveys a suspicion for malignancy. In the present case, a cystic mass was seen in the inguinal canal on superficial ultrasound done to investigate presumed inguinal hernia, appendiceal mucocele was suspected based on lower abdominal MRI findings, and the final diagnosis was made postoperatively. Appendiceal mucocele is associated with colon cancer in approximately 21% of cases.<sup>7</sup> For this reason, perioperative colonoscopy is recommended. Colonoscopic examination of our patient conducted 5 months earlier revealed no pathology, including mucocele. Despite unremarkable laboratory results, elevated levels of tumor markers (CEA, CA19-9) are suspicious for malignancy.<sup>8</sup> Even in such cases, biopsying an appendiceal mucocele (including needle biopsy) is not recommended due to the risk of rupture and pseudomyxoma peritonei.<sup>2</sup> Treatment of appendiceal mucocele is resection. Appendectomy appears to be sufficient in cases with no suspected malignancy. If malignancy is suspected, right hemicolectomy is another option. The most serious intraoperative complication in these patients is pseudomyxoma peritonei resulting from appendiceal mucocele rupture. Five-year survival is said to be below 20% in such cases.<sup>9</sup> Care must be taken to avoid mucocele rupture and peritoneal contamination with cyst fluid during surgery. Therefore, for many years it was recommended that patients with suspected appendiceal mucocele undergo laparotomy and a safe appendectomy, and that laparoscopic surgery be avoided.<sup>10</sup> With advances in laparoscopy and robotic surgery, the use of these methods in the surgical treatment of appendiceal mucocele has become increasingly prevalent.<sup>9,11,12</sup> Amyand hernia is a rare condition in which the appendix is in the inguinal canal, and accounts for about 1% of all inguinal hernias.<sup>13</sup> As in all hernias, repair surgery with graft is required for treatment. Although simultaneous appendectomy and prosthetic mesh

application is controversial, the use prosthetic mesh with appendectomy has been recommended recently.<sup>14</sup> Prosthetic mesh is not recommended in cases with acute infection.<sup>15</sup> As we see in our case, Amyand hernia and appendiceal mucocele were coexistent. Because the hernia could not be reduced during the patient's physical examination, we decided laparotomy was the best approach to the appendectomy. We used prosthetic mesh in the hernia repair surgery. The patient exhibited no problems at follow-up on postoperative day 20. The pathology report indicated that the appendiceal mucocele was a low-grade appendiceal mucinous neoplasm (Figures 3, 4).



Figure 3. Macroscopic view of appendiceal mucocele

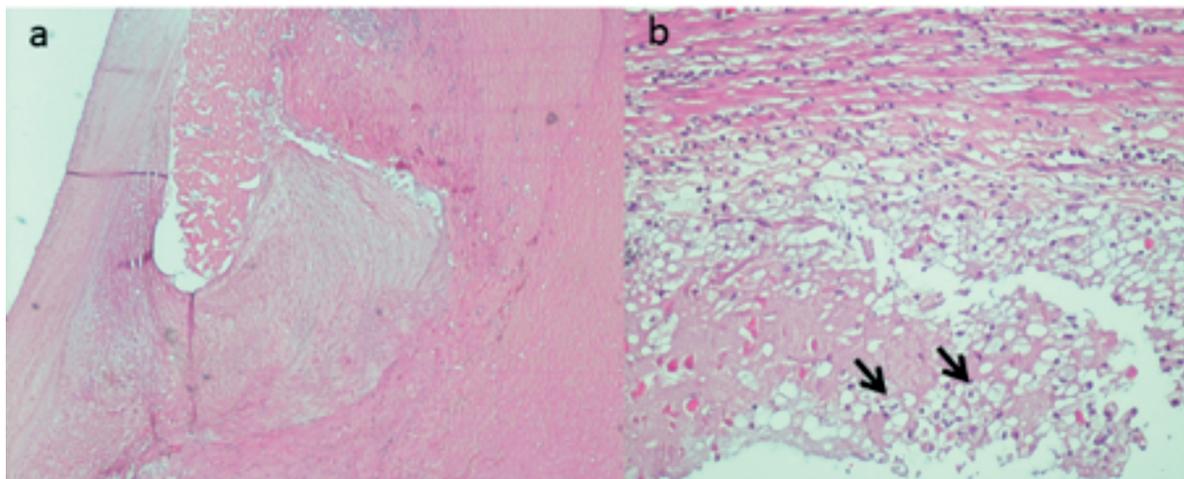


Figure 4. a) Atrophy of normal appendiceal lymphoid tissue, loss of crypts, and muscularis mucosa, b) numerous muciphages in the appendiceal lumen (400x, haematoxylin and eosin)

Though rare, Amyand hernia should be considered when evaluating patients with inguinal hernias. When irreducible inguinal hernia is detected in physical examination, appendiceal mucocele accompanied by Amyand hernia should be considered and appropriate care should be taken during the treatment process.

### Ethics

**Informed Consent:** Consent form was filled out by the patient.

**Peer-review:** External and internal peer-reviewed.

### Authorship Contributions

**Surgical and Medical Practices:** E.Z., M.Ç., **Concept:** E.Z., M.Ç., **Design:** E.Z., **Data Collection or Processing:** E.Z., P.H., **Analysis or Interpretation:** E.Z., P.H., **Literature Search:** E.Z., M.Ç., **Writing:** E.Z.

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