

# Amyand's Hernia: A Case Report

## Amyand Hernisi: Olgu Sunumu

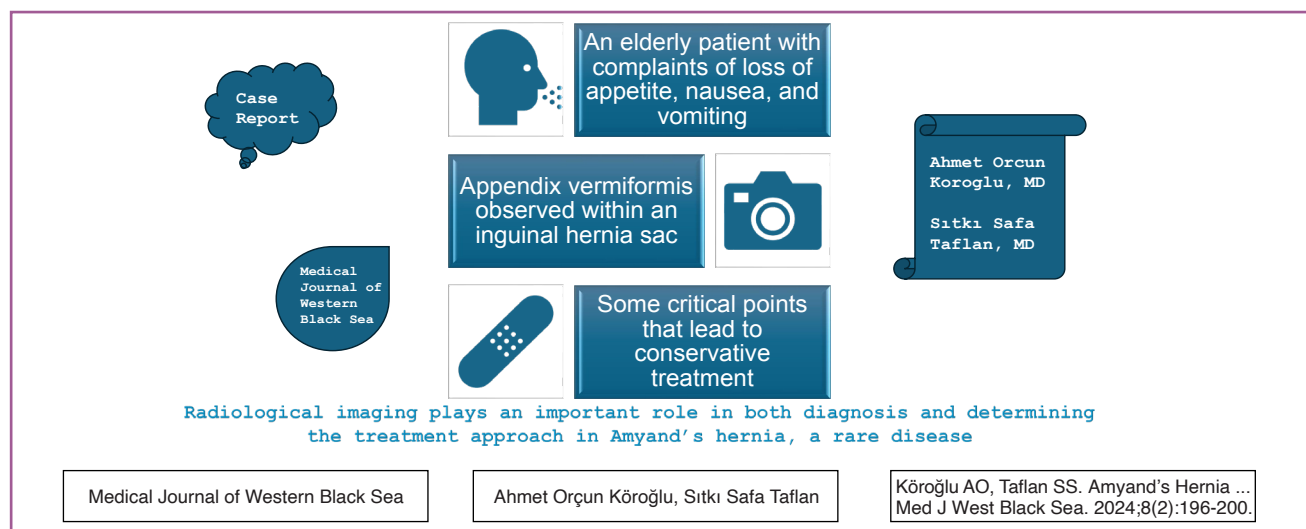
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### GRAPHICAL ABSTRACT



### ABSTRACT

Amyand's hernia is defined as the presence of the appendix vermiformis (inflamed or non-inflamed) within the inguinal hernia sac. It is seen in approximately 1% of inguinal hernia cases. This extremely rare condition is often diagnosed conventionally, at surgery. However, with the increasing use of computed tomography (CT) and ultrasonography (US) examinations, preoperative diagnosis is also possible. The treatment approach varies depending on whether the appendix inside the hernia sac is inflamed or not. For this reason, imaging examinations are of great importance in making a diagnosis and directing treatment. As a result of imaging examinations in an elderly patient in our clinic, colon, small intestine segments, omentum and appendix were detected in the right inguinal canal. Since the appendix was also located within the hernia sac, the case was called Amyand's hernia. In this article, we wanted to draw attention to Amyand's hernia in general and the place of radiological examination in diagnosis and treatment of this disease.

**Keywords:** Appendix vermiformis, Amyand's hernia, inguinal hernia, computed tomography, ultrasonography

## GRAFİKSEL ÖZET



## ÖZ

Amyand hernisi appendiks vermiformisin (inflame veya non- inflame) inguinal herni kesesi içerisinde bulunması olarak tanımlanır. İnguinal herni olgularının yaklaşık %1' inde görülür. Bu son derece nadir görülen durum sıklıkla geleneksel olarak, ameliyatta teşhis edilir. Ancak giderek artan oranda bilgisayarlı tomografi (BT) ve ultrasonografi (US) tetkiklerinin kullanımıyla birlikte ameliyat öncesi teşhis de mümkündür. Herni kesesi içerisindeki appendiks inflame olup olmamasına göre tedavi yaklaşımı değişmektedir. Bu sebeple tanı koymada ve tedaviyi yönlendirmede görüntüleme tetkikleri büyük öneme sahiptir. Kliniğimizde yaşlı bir hastada görüntüleme tetkikleri sonucunda sağ inguinal kanal içerisinde kolon, ince bağırsak segmentleri, omentum ve apandiks tespit edildi. Apandiks de fıtık kesesi içerisinde bulunduğundan olgu Amyand hernisi olarak adlandırıldı. Bu yazımızda genel olarak Amyand hernisine ve bu hastalıkta radyolojik incelemenin tanı ve tedavideki yerine dikkat çekmek istedik.

**Anahtar Sözcükler:** Appendiks vermiformis, Amyand hernisi, inguinal herni, bilgisayarlı tomografi, ultrasonografi

## INTRODUCTION

A hernia is defined as the protrusion of any organ or tissue from its anatomical position through the abdominal wall, fascia, or any connective tissue. Inguinal hernia is the most prevalent type among hernias. It generally presents to a clinic with a bulge in the groin region. The omentum, small intestine, or bladder can be found within the inguinal hernia sac. Occasionally, herniation of appendix vermiformis can also be seen (1,2). Amyand's hernia is defined as the presence of the appendix vermiformis within the inguinal hernia sac, whether inflamed or not (3-5). "Claudius Amyand, surgeon to King II George who first discovered a perforated appendix vermiformis within the hernia sac and named the disease with his own name" (6,7). Amyand hernia is an uncommon type of hernia with an incidence of %0.5 – 1 (8,9). It is mostly seen on the right, but if the high mobility of caecum is present, it can be seen on the left (10). Diagnosis of Amyand's hernia preoperatively is challenging. Imaging modalities such as computed tomography (CT) and ultrasonography (US) helpful but the laparoscopy still remains they gold standart in they ultimate diagnosis. Treatment

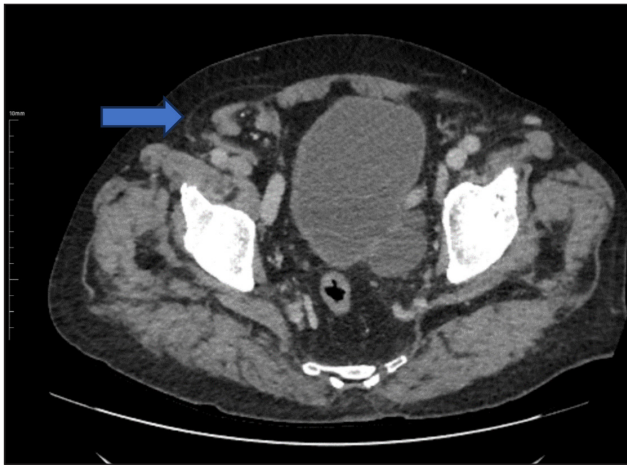
options depend on patient's condition but routinely appendectomy is preferred. Application of routine appendectomy is still debatable. In this investigation, we report a rare case of Amyand's hernia in an elderly patient in which appendectomy is not preferred.

## CASE REPORT

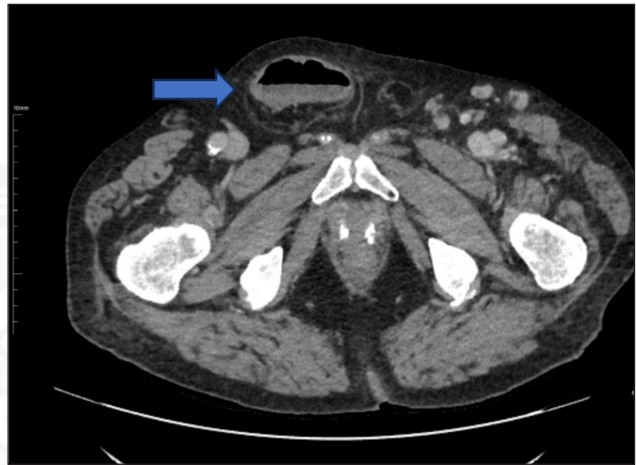
A 91-year-old male patient presented to our hospital's emergency department with symptoms of decreased appetite, nausea, and vomiting. He stated that his complaints lasted for 2 days. The patient was referred from an external center with suspicion of acute appendicitis and hernia. There was no abdominal pain upon admission. Gas and stool discharge was also present. On physical examination, the abdomen is comfortable; There was no defense, rebounding or precision. Bowel sounds were hyperactive. At the same time, spontaneously reducing umbilical hernia and reducible right-sided inguinal hernia were detected in the physical examination. Rectal examination revealed normal stool smear. There was a significant widespread temperature increase, swelling, hyperemia and diameter differ-

ence in the left leg compared to the right. There was edema in the pretibial and dorsum of the foot. Other system examinations were normal. It was discovered that he had been suffering from chronic heart failure, coronary artery disease, diabetes mellitus and hypertension for many years. He had a previous surgical history of coronary artery bypass graft operation. In laboratory evaluation, white blood cell count was: 24 K/UI, CRP: 74 mg/l. Other biochemical parameters were at normal values. US and CT were performed as imaging examinations. As a result of these examinations,

bowel loops and omentum herniated through a 32 mm wide fascial defect at the umbilicus level were observed. At the same time, the colon, small bowel loops and omentum herniated from the right inguinal region were observed. It was seen in the appendix hernia sac. No findings consistent with appendicitis were observed (Figures 1-4). The patient was consulted at the general surgery and infectious disease clinics at our institution. Considering that the patient's complaints on the left leg were in favor of cellulitis, it was decided to take a blood culture, start appropriate antibiotic



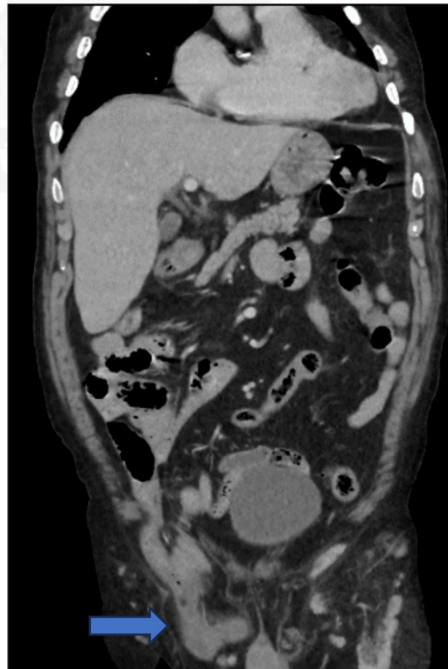
**Figure 1:** Axial CT image shows enlarged right inguinal canal and appendix beginning to herniate into the canal (Arrow).



**Figure 2:** Axial CT image shows enlarged right inguinal canal and inguinal herniation (Arrow).



**Figure 3:** Sagittal reformat of the CT scan shows the herniated appendix as hyperdense tissue in the anterior abdominal wall suggesting Amyand's hernia (Arrow).



**Figure 4:** Coronal reformat of the CT scan shows the herniated appendix into the inguinal canal (Arrow).

therapy, and check the infectious diseases outpatient clinic. Surgical intervention was not considered for the patient due to umbilical hernia and Amyand's hernia. No pathological condition was encountered during follow-up and control examinations.

## DISCUSSION

The appendix can be found in different anatomical regions. The primary reasons for this are the different location of the cecum or malrotations that develop during intestinal rotation during the embryological period. When the cecum is large in size, the appendix may extend into the pelvis and become displaced (11).

While the appendix may be within the hernia sac, there are also cases showing that the appendix is within the scrotum and left inguinal hernia sac. Reasons for it being left-sided include situs inversus, mobile cecum, and intestinal malrotation (10).

With the discovery of a perforated appendix within the hernia sac by Claudius Amyand in 1735; The presence of the appendix within the inguinal hernia sac is defined as Amyand's hernia (6,7). The herniated appendix may remain normal, that is, non-inflamed. When there are factors that may cause inflammation, the blood supply to the appendix may be impaired and acute appendicitis may develop. These reasons include adhesions formed in chronic hernias and increased intra-abdominal pressure (8,9). Amyand's hernia is more common in men, but female patients with Amyand's hernia are postmenopausal and usually have a femoral hernia (12). The presence of a normal appendix in the inguinal hernia sac accounts for %1 of all external hernias (8,9). The occurrence of inflamed and/or perforated appendicitis concomitant with incarcerated inguinal hernia is extremely rare, accounting for approximately 0.13% of all acute appendicitis cases (13). In this case we presented, there was a non-inflamed appendix within the right-sided inguinal hernia sac.

Diagnosing Amyand's hernia preoperatively is still challenging. Diagnosis is often made intraoperatively. However, US or CT can be helpful to show the appendix inside the hernia sac (14,15). "Luchs et al. reported two cases of incarcerated Amyand's hernia, which they diagnosed preoperatively with CT" (14). In addition, "Weber argued that Amyand's hernia could be diagnosed preoperatively" (16).

In the differential diagnosis of Amyand's hernia, one may encounter "incarcerated or strangulated inguinal hernia, inguinal lymphadenitis, testicular torsion, acute epididymitis, acute hydrocele, and focal panniculitis" (8). At this juncture, imaging methods are crucial for achieving an accurate diagnosis. To confirm the presence of Amyand's hernia, sagittal and coronal reformat CT images are valuable for visualizing

the appendix, a blind-ended tubular structure that enters the inguinal canal. Signs of inflammation of the appendix on CT include an increase in lumen diameter, fluid collection, contamination of periappendicular fatty tissue, and cecal thickening. "US may also reveal the presence of a blunt-ended, non-compressible ring within the inguinal hernial sac; Inflammation is suspected if there is a dilated appendix lumen (lumen diameter > 7.2 mm), increased vascularity of the wall, and tenderness during compression" (17,18).

Since Amyand's hernia is an uncommon clinical condition, there is a scarcity of studies in the literature involving large series. For this reason, there is no universally agreed-upon treatment protocol. Treatment approaches vary based on the condition of the appendix within the hernial sac. If the appendix in the sac is inflamed or perforated, appendectomy is performed. However, if a non-inflamed appendix is detected, whether appendectomy should be performed or not is a matter of debate due to the risk of infection in routine hernia repairs. The risk of infection that may develop is unknown. It is not preferred to perform appendectomy prophylactically in the elderly patient group. The causes for this have been shown to be prolonged surgery time, other accompanying diseases, and the low probability of appendicitis in this age group. It has been documented that appendicitis may be provoked due to manipulation of the normal appendix within the hernia sac (6,15). While Lasonof and Basson argue that if the appendix is normal, appendectomy can only be performed in young patients and that the appendix vermiformis should be reduced without performing appendectomy; Ofili stated that he performed appendectomy on 11 patients with Amyand's hernia. He reported that he did not encounter complications such as wound infection or recurrent hernia, and advocated that appendectomy should be performed in all Amyand hernias (19,20). In our case, the decision was made not to perform surgical treatment because a non-inflamed appendix was found in the inguinal hernia sac in an elderly patient. Amyand's hernia; Since it is rare, not enough studies have been done on it and there is still no clear and accepted approach to its treatment. At this point, we aimed to conduct to the literature with our case, where a generally accepted treatment approach was applied and positive results were obtained.

In conclusion, Amyand's hernia is an uncommon variety of inguinal hernia that is more prevalent, particularly among the elderly. The rarity of this condition complicates the initial clinical diagnosis. Radiological examinations performed at this stage are the only way to visualize the appendix within the herniated inguinal canal. Additionally, the treatment plan varies depending on whether the appendix is inflamed or not. For all these reasons, imaging methods are very useful in Amyand's hernia cases; It provides guidance in terms of diagnosis and treatment approach.

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#### Author Contributions

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#### Conflicts of Interest

The authors have no conflict of interest to declare.

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#### Ethical Approval

Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

#### Review Process

Externally peer-reviewed.

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