

# A rare disease mimics postoperative bile leakage: Invasive aspergillosis

Fatih Mehmet Yazar, M.D.,<sup>1</sup> Aykut Urfaloğlu, M.D.,<sup>2</sup> Ömer Faruk Boran, M.D.,<sup>2</sup> Hamide Sayar, M.D.,<sup>3</sup>  
Burhan Hakan Kanat, M.D.,<sup>4</sup> Arif Emre, M.D.,<sup>1</sup> Emrah Cengiz, M.D.,<sup>1</sup> Ertan Bülbüloğlu, M.D.<sup>1</sup>

<sup>1</sup>Department of General Surgery, Sütçü İmam University Faculty of Medicine, Kahramanmaraş-Turkey

<sup>2</sup>Department of Anesthesiology, Sütçü İmam University Faculty of Medicine, Kahramanmaraş-Turkey

<sup>3</sup>Department of Pathology, Kahramanmaraş Sütçü İmam University Faculty of Medicine, Kahramanmaraş-Turkey

<sup>4</sup>Department of General Surgery, Elazığ Training and Research Hospital, Elazığ-Turkey

## ABSTRACT

*Aspergillus* fungi can cause serious infections, including intra-abdominal infection, particularly in patients with compromised immune system. Described in the present report is case of 46-year-old female patient who had undergone laparoscopic cholecystectomy (LC) at another healthcare facility. In early postoperative period, she had increasing complaints of swelling, nausea, and vomiting. On postoperative 19<sup>th</sup> day, she was referred to our clinic with diagnosis of acute abdomen. Surgery was performed with suspected possibility of bile leakage. However, pathological examination of soft, yellow-green mass found in subhepatic space determined it was fungus ball caused by fungi of the genus *Aspergillus*. Patient was diagnosed postoperative intra-abdominal aspergillosis (IAA).

**Key words:** Invasive aspergillosis; laparoscopic cholecystectomy; postoperative bile leakage.

## INTRODUCTION

*Aspergilli* are hyphal fungi that are widely distributed in nature; their natural habitat is soil and decaying plant material. Having rich enzyme systems, they can decompose and use almost all types of organic material, and they can grow even at very low moisture levels compared to other microorganisms.<sup>[1]</sup>

They do not need humans as a host to complete their life cycle, but under appropriate conditions they can become pathogenic in humans. They are a type of fungi present with high density in the air, and they can be carried anywhere by means of conidia that are dispersed in the atmosphere. They

often cause respiratory tract infections in humans; rarely, gastrointestinal tract, solitary abdominal organs, and lymph nodes may also be attacked. Although distribution may occur easily through blood, especially in immunosuppressive patients, particularly after construction or renovation work in hospitals, contamination of surgical instruments may cause deep abdominal surgical infections.<sup>[2]</sup>

Described in the present report is case of intra-abdominal aspergillosis (IAA) in patient who underwent laparoscopic cholecystectomy (LC) at another medical center and was subsequently admitted to our hospital in postoperative period with suspicion of leak.

## CASE REPORT

LC for symptomatic cholelithiasis was performed on 46-year-old female patient at another medical facility. After epicrisis and talking with surgeon who performed the operation, patient was assessed for right upper quadrant (RUQ) pain. Preoperative routine laboratory values had been normal, ultrasonography showed multiple millimetric stones in gallbladder, and due to symptomatic gallbladder disease, operation was performed under elective conditions. Surgery was in accordance with standards, and exploration of abdomen during operation found no pathology. Drain left in abdomen after

Address for correspondence: Fatih Mehmet Yazar, M.D.

Sütçü İmam Üniversitesi Tıp Fakültesi, Genel Cerrahi Anabilim Dalı,  
Kahramanmaraş, Turkey

Tel: +90 344 - 280 34 34 E-mail: fmyazar@hotmail.com

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operation was removed on first postoperative day with no significant output, and on second day, patient was discharged without problems. However, patient began to complain of bloating in succeeding days. Her complaints gradually increased, and she was hospitalized again on seventh postoperative day because of onset of nausea and vomiting. Medical treatment was initiated, but clinical tableau did not improve. Due to continued increase in intra-abdominal fluid and development of acute abdominal findings, patient was referred to our clinic on 19<sup>th</sup> day.

Patient looked pale and dehydrated. Blood pressure was 125/70 mmHg, heart rate was 84/bpm and temperature was 37.2 °C. Abdominal examination revealed sensitivity and rigidity, particularly in RUQ.

Laboratory analysis indicated moderate liver enzyme disorders: aspartate aminotransferase (AST) and alanine aminotransferase (ALT) values were 1.5 times higher than normal, and alkaline phosphatase (ALP) and gamma-glutamyl transpeptidase (GGT) values were approximately 2 times higher. Bilirubin values and other biochemical parameters were normal.

Patient intravenous (IV)/oral contrast abdominal computed tomography (CT) of abdomen revealed liquid advancing to left of abdominal midline, especially in subhepatic space, and well-circumscribed mass of about 10 cm was observed in left subhepatic area (Fig. 1). Decision was made to perform emergency operation due to acute abdominal symptoms, with presumptive diagnosis of biliary leakage, foreign object, and abscess.

Laparoscopic incision line below umbilicus was reopened and laparoscopic trocar inserted to attempt exploration of abdomen. However, adequate field of view could not be achieved and laparotomy was performed with midline incision to enter abdomen. Exploration revealed about 1500 cc of yellow-green fluid, presumed to be bilious, present in subhepatic space, especially in right subhepatic space. Material with discoid appearance, approximately 10x10 cm in size and with gelatinous



Figure 1. Preoperative tomographic image of the patient.

consistency found in left subhepatic space (Fig. 2). Considering patient's previous surgery, bile duct injury was suspected. Cystic duct stump was found and clips were removed. Cystic duct was cannulated and intraoperative cholangiography was taken. Leakage was not observed on cholangiography. As a precautionary measure, a tube was inserted in cystic duct and external biliary drainage was provided.

In postoperative period follow-up, clinical tableau resolved. Cholangiography was taken on the 21<sup>st</sup> day and as leakage was still not observed, drainage catheter was removed. Pathology result after examination of mass led to diagnosis of aspergillosis (Fig. 3a, b). Additional treatment was not recommended and patient was referred to infectious disease department.

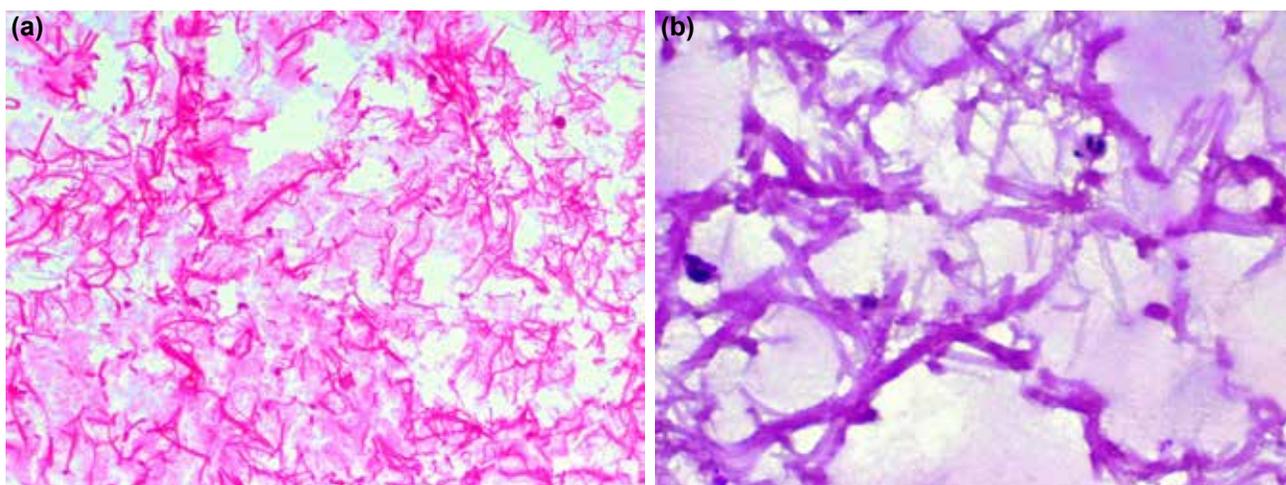
## DISCUSSION

*Aspergillus* species can cause allergies and mycotoxicoses, as well as infections called aspergillosis. As the disease is generally seen in individuals with immune system disorders, and is created by infectious agents suspended in the air, it often leads to pulmonary infections. However, skin, adrenal glands, central nervous system (CNS), liver, spleen, and gastrointestinal system involvement can also be seen in individuals with immune system disorders. As in present case, in individuals with normal immune system, it has also been reported that IAA may develop as result of operating room sterilization problems.<sup>[2,3]</sup>

Gastrointestinal presentation of invasive aspergillosis (IA) is unusual. In a study conducted by Hori et al. that examined an autopsy series, it was reported that small intestine-localized gastrointestinal system (GIS) aspergillosis was detected in 37 of 107 cases examined.<sup>[2]</sup> GIS aspergillosis, a form that has high mortality rates, is characterized by mesenteric artery invasion, intravascular thrombosis, and tissue ischemia. Clinical-



Figure 2. Image of fungus ball removed from the subhepatic space.



**Figure 3.** (a) The histopathological appearance of the mass removed from the subhepatic space, hypha structures branching with narrow angle in necrotic ground (H&E, x100). (b) More prominent appearance of the hypha in the PAS histochemical stain (PAS, x400).

ly, it can present with fever, abdominal pain, ileus, peritonitis, bloody diarrhea and hemochezia.<sup>[3]</sup> In addition, apart from gastrointestinal tract, urinary system may also be affected.<sup>[4]</sup>

Literature survey indicated that the present case is first to develop after LC. Patient began to complain about bloating on second postoperative day, and 5 days later, nausea and vomiting were added to tableau. However, such findings can develop in all abdominal infections, so they cannot be expected to bring IA to mind.

*A. fumigatus*, which is responsible for 90% of cases of IA, has germination rate of 5–12 hours. It has been shown that with proper humidity and temperature, it can reach 4–8 times its normal size. As a result, it may take days or weeks for disease to colonize and emerge in patients.<sup>[4]</sup> For example, a disseminated disease was reported to occur in a 3-week period for a patient with heart transplantation, while in another laparotomy patient, period was 48 hours.<sup>[5]</sup> Routine laboratory tests and imaging performed at another medical center before operation on present patient revealed no pathological findings, other than cholelithiasis. Abdominal distention started 2 days after surgery, and clinically worsening patient was then referred to our hospital 19 days after operation. Although length of time required for aspergilli to multiply, proliferate, and disseminate disease varies, the onset of symptoms after 48 hours observed in present case, their progressive increase, and becoming very apparent in about 3 weeks correlates to GIS symptoms seen with aspergillosis.

When patient underwent emergency operation, a mass of approximately 10x10 cm, well-circumscribed, yellow-green in color and of gelatinous consistency was observed in subhepatic space of abdomen and subsequently sent to pathology. There was also about 1500 cc of similarly colored liquid in the abdomen. Intraoperative bile leakage was considered and surgical treatment was applied. Fungi that are derivative of *Aspergillus* produce pigments with various colors.<sup>[6]</sup> In partic-

ular, it is known that some *Aspergillus* conidia produce green pigment. When we re-evaluated the patient retrospectively, we considered that pigment produced by the fungus may have caused the yellow-green color of the mass and that the greenish fluid in the abdomen had not been bile.

Aspergilli may cause deep abdominal surgical infections, especially after construction or renovation work in hospitals, due to contamination of surgical instruments. In the present case, when we interviewed the surgeon who first operated on the patient, we learned that there were renovations ongoing in the hospital at that time. This also explains patient's clinical picture. Additionally, lack of pathology observed in patient on physical examination, laboratory tests, and imaging before initial operation and progressive worsening of clinical tableau after the operation support idea that lesion occurred secondary to bad sterilization.

Another important issue is early diagnosis of aspergillosis and starting appropriate treatment as soon as possible. Especially in patients with immune system disorders, this is of vital importance. Combined use of microscopic examination and culture results facilitates clinician's diagnosis. However, it should be remembered that blood cultures of patients are rarely positive, and even in cases of pulmonary involvement, bronchoalveolar lavage (BAL) fluid culture is positive only in advanced patients; diagnosis is generally immediately before patient death. Kusne and al. reported in their study that even in pulmonary aspergillosis cases, 79% are reported in cultures. Therefore, in GIS aspergillosis, except for blood cultures, it is mostly diagnosed with biopsies and histological examination of biopsy material that was removed surgically. If we had thought the yellow-green fluid might have been due to aspergillosis, culture of the fluid might have helped.

Invasive fungal infection such as aspergillosis may occur as result of improper sterilization conditions. It can be simply and effectively prevented with more attention to sterilization. Es-

pecially in the presence of underlying predisposing condition, it should be kept in mind that these infections can imitate bile leakage, one of the common complications of LC, because of the pigments produced by such fungal infections.

Conflict of interest: None declared.

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## OLGU SUNUMU - ÖZET

### Ameliyat sonrası safra kaçağını taklit eden nadir bir hastalık: İnvaziv aspergillozis

Dr. Fatih Mehmet Yazar,<sup>1</sup> Dr. Aykut Urfaloğlu,<sup>2</sup> Dr. Ömer Faruk Boran,<sup>2</sup> Dr. Hamide Sayar,<sup>3</sup> Dr. Burhan Hakan Kanat,<sup>4</sup> Dr. Arif Emre,<sup>1</sup> Dr. Emrah Cengiz,<sup>1</sup> Dr. Ertan Bülbüloğlu<sup>1</sup>

<sup>1</sup>Sütçü İmam Üniversitesi Tıp Fakültesi, Genel Cerrahi Anabilim Dalı, Kahramanmaraş

<sup>2</sup>Sütçü İmam Üniversitesi Tıp Fakültesi, Anestezi Anabilim Dalı, Kahramanmaraş

<sup>3</sup>Sütçü İmam Üniversitesi Tıp Fakültesi, Patoloji Anabilim Dalı, Kahramanmaraş

<sup>4</sup>Elazığ Eğitim ve Araştırma Hastanesi, Genel Cerrahi Kliniği, Elazığ

Özellikle bağışıklık sisteminde sorun olan hastalarda ciddi enfeksiyonlara neden olan *Aspergillus* ailesi nadiren karın içi enfeksiyonlara da neden olabilmektedir. Dış merkezde laparoskopik kolesistektomi ameliyatı olan ve ameliyat sonrası erken dönemde başlayarak, giderek artan şişkinlik, bulantı ve kusma şikayetleri olan hasta ameliyat sonrası 19. günde akut karın tanısı ile kliniğimize sevk edildi. Hasta, safra kaçağı düşünülerek ameliyat edildi, ancak eksplorasyonda suphepatik alanda bulunan sarı-yeşil renkte yumuşak kitlenin patolojik incelemesinde aspergilloz enfeksiyonuna bağlı fungus topu olduğu anlaşıldı. Ameliyat sonrası karın içi aspergillus tanısı alan 46 yaşındaki kadın hasta literatür eşliğinde sunuldu.

Anahtar sözcükler: Ameliyat sonrası safra kaçağı; invaziv aspergillozis; laparoskopik kolesistektomi.

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