

Gallbladder ascariasis

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Background/aims: Gallbladder ascariasis is rarely encountered. The causative agent is *Ascaris lumbricoides*. Presence of ascaris inside the gallbladder can incite acalculous cholecystitis. We aimed in this report to study gallbladder ascariasis. **Methods:** This is a case study of 28 patients with a diagnosis of gallbladder ascariasis from 2005 to 2010 who were seen in the Department of General Surgery, SMHS Hospital. **Results:** Three patients with gallbladder ascariasis had associated worms in the common bile duct. On abdominal sonography, all patients showed worms as linear echogenic shadows or the worms showed “belly dance” of worms when actively moving. Acute acalculous cholecystitis was present in 21 patients, and 7 had biliary colic. Dead worms in the gallbladder were seen in 4 patients, of which, one was fragmented and another had calcified form of parasite. Twenty-two patients had spontaneous exit of worms from the gallbladder with a time interval ranging from 1 hour to 144 hours from the time of a diagnosis. Six patients had cholecystectomy. Two patients were subjected to emergency cholecystectomy due to multiple impacted worms not exiting from the gallbladder after conservative treatment. **Conclusions:** Based on our experience, ultrasound diagnosis is advocated as a highly sensitive and noninvasive technique for suspected gallbladder ascariasis and it can be repeated frequently to monitor movement of worms in the gallbladder and common bile ducts.

Key words: Gallbladder, ascariasis, surgery, conservative

Safra kesesi ascariasisi

Amaç: Safra kesesi ascariasisi nadir karşılaşılan bir durumdur. Nedeni *Ascaris lumbricoides*'tir. Safra kesesinde ascarisin bulunması akalküloz kolesistite neden olabilir. Bu çalışma safra kesesi ascariasisini incelemek üzere yapılmıştır. **Yöntem:** Bu çalışmada 2005 – 2010 yılları arasında SMHS Hastanesi genel cerrahi kliniğinde tespit edilen 28 safra kesesi ascariasisi tanılı vaka incelenmiştir. **Sonuçlar:** Safra kesesi ascariasisi olan 3 hastada beraberinde koledokta da ascariasis tespit edildi. Abdomen ultrasonografisinde, tüm hastalarda parazitler lineer ekojenik gölgeler şeklinde veya hareket ettiklerinde “göbek dansı” bulgusu ile tespit edildi. 21 hastada akut akalküloz kolesistit ve 7 hastada biliyer kolik mevcuttu. Dört hastada safra kesesinde ölü parazitler tespit edildi ve bunlardan bir tanesi fragmant ve diğeri kalsifiye tipteydi. Yirmi iki hastada tanıdan itibaren 1 – 144 saatlik bir süre zarfında parazitlerin safra kesesinden spontan olarak ayrıldıkları görüldü. Altı hastaya kolesistektomi yapıldı. İki hastaya ise konservatif tedavi altında kese boynuna impakte olan parazitlerin keseden çıkamaması nedeni ile acil kolesistektomi yapıldı. **Sonuç:** Safra kesesi ascariasisinden şüphe edilen vakalarda ultrasonografi duyarlı ve invaziv olmayan bir yöntemdir ve parazitlerin safra yollarına geçişinin takip edilmesi için sıklıkla kullanılabilir.

Anahtar kelimeler: Safra kesesi, ascariasis, cerrahi, konservatif

INTRODUCTION

The causative agent of the disorder (gallbladder ascariasis) is *Ascaris lumbricoides* roundworm, the most frequent human intestinal nematode prevalent especially in moist tropical and subtropical regions (1). Infestation of the gallbladder with ascaris worms is rare (accounting for 2.1% of biliary ascariasis cases), and has mostly resulted

from high intestinal parasite load in the host (2). The narrow and tortuous nature of the cystic duct connecting with the biliary tree limits access to the gallbladder. The ascaris female worm has a higher predisposition for entering openings in the hepatobiliary system (3). With gallbladder ascariasis, worms in the common bile duct (CBD) are

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also occasionally seen. The intrinsic anatomy of the biliary system is a strong determinant for migration of the worm inside the gallbladder (4). Presence of a worm in the gallbladder induces an acute cholecystitis. Abdominal sonography constitutes a suitable tool for diagnosis, particularly in endemic countries, and is used to reveal infection when patients encounter high parasitic burden. However, sonographic findings might be confounded by zigzag and meandering movements, which are characteristic of active live worms (5).

Ascaris lodged in the gallbladder responds poorly to medical treatment because less than 1% of the volume of antiparasitic drugs is excreted in bile (6). Conservative treatment often fails in the presence of a dead worm, concomitant stones or internal structure, which prevents the return of the worm into the duodenum (7). Our strategy for conservative management was based on the principle of the ability of the worm to “wander”, leading to its spontaneous escape from the gallbladder. The primary aim of this report was to study the clinical features of patients diagnosed with gallbladder ascariasis and the treatment outcomes.

MATERIALS AND METHODS

This prospective study encompasses a case study of 28 patients who were diagnosed with gallbladder ascariasis from March 2005 to March 2009. Patients ranged in age from 2 to 66 years, with a sex distribution of 16 females and 12 males. Clinical features, radiological investigations and modality of applied treatment were considered in the study.

Worms were demonstrated by ultrasonography (USG) based on echogenic linear shadow without acoustics in the gallbladder or the typical belly dance of moving live worms in the gallbladder. Presence of acute cholecystitis was also confirmed by USG. Serial USG was carried out to assess whether worms exited after conservative treatment. Conservative management was used as for acalculous cholecystitis. Anthelmintic was given after the patient was pain free. Surgical intervention was done as a form of cholecystectomy, if required.

RESULTS

All 28 patients had been diagnosed with the disorder by USG. Presentations in patients were right upper abdominal pain, colicky-type pain, vomit-

ing, and fever. Of 28 patients, 13 were children (age <14 years) and 5 were over 15 years. The evidence of acute acalculous cholecystitis was present in 21 patients, whereas 7 had biliary colic. Wall thickness of the gallbladder ranged from 7 mm to 2 cm. The number of worms in the gallbladder ranged from 1 to 11 live worms (Figure 1). Two patients had associated worms in the CBD. Eleven patients had multiple live worms (more than 1) in the gallbladder, 13 patients had 1 live worm, 4 patients had a dead *ascaris* in the gallbladder, one of which was calcified. In 2 patients, the dead worm fragment was accompanied by calculi in the gallbladder. In addition, 1 patient manifested 2 calculi in the gallbladder associated with 2 worms in the gallbladder, which at the time of surgery were present in the CBD (Figures 2, 3).

Twenty-two patients were managed conservatively. Six patients underwent cholecystectomy. In cases of spontaneous passage of worms from the bile duct, the time interval varied from 24 hours to 144 hours. Minimum time range for clearance of worms from the gallbladder was one hour from the time of diagnosis.

Of the 6 patients with cholecystectomy, 2 had impacted worm mass inside the gallbladder (the first after 6 days, and the second after 8 days). One patient had a dead worm, fragmented dead worm, and another calcified worm inside and one had calculi with two worms inside the CBD. In 3 patients, CBD exploration was conducted, with removal of worms using T-tube drainage, which was removed after 14 days. Histopathology documented cholecystitis in each case. No eosinophilic cholecystitis was seen. Patients with worms impacted in the gallbladder first underwent cholecystostomy for parasite removal and then cholecystectomy.

DISCUSSION

A high worm load in the intestine is associated with a myriad of complications in the abdomen, and gallbladder ascariasis belongs to this category of disorders (8). Due to its wandering nature, the *ascaris* has a propensity to seek natural orifices within the body that leads also to its migration into the gallbladder. Parasite lodging can be associated with various hepatobiliary symptoms. Worms in the CBD and cystic duct cause gallbladder distension and usually induce acute cholecystitis. Acute cholecystitis in the gallbladder can be implicated by obstruction of the cystic duct, multiple worms completely distending the gallbladder, asca-

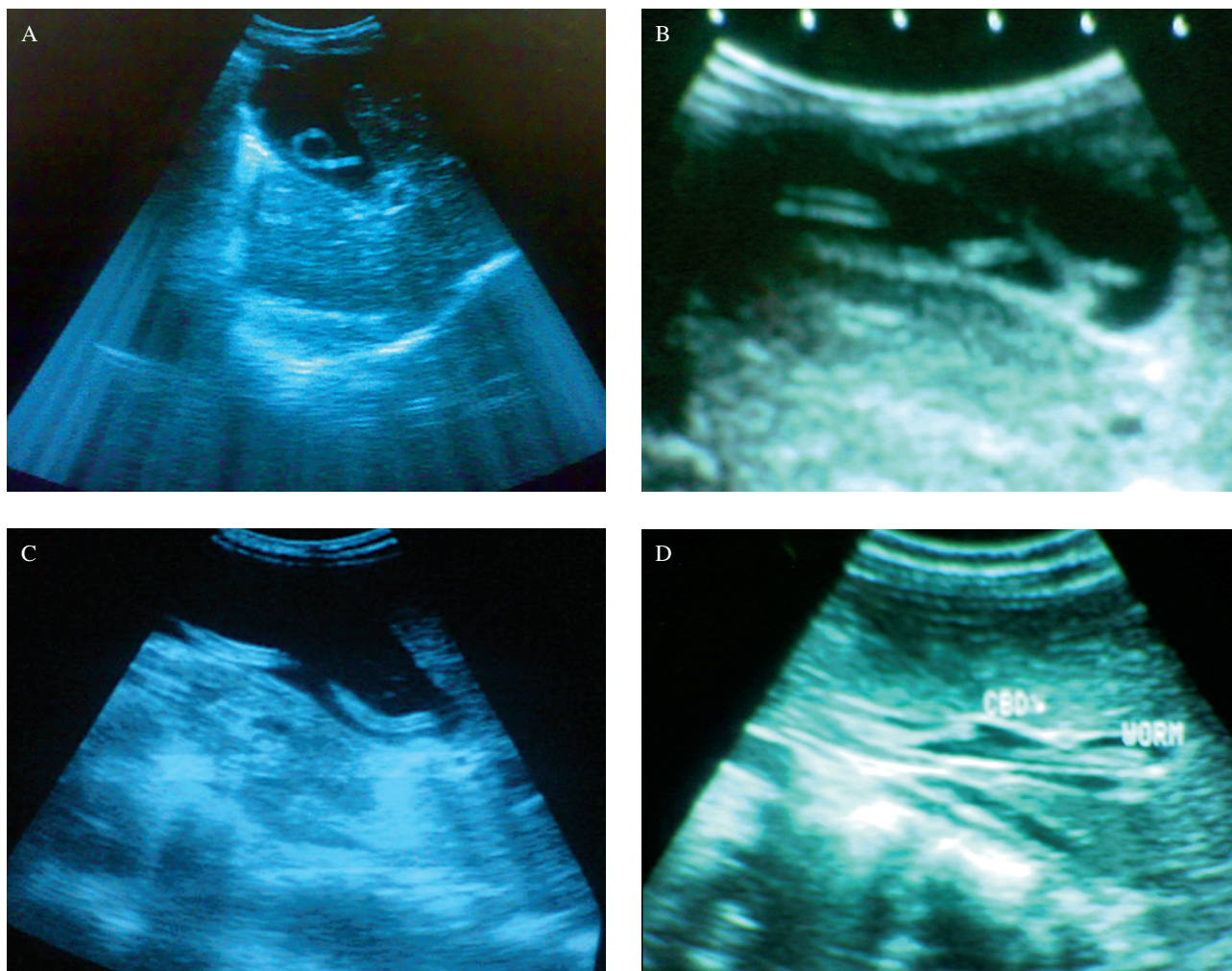


Figure 1. Ultrasound image of ascaris in the gall bladder (Fig A, B and C), ascaris in the common bile duct (D).

ris eggs causing obstruction of the cystic duct, and nidus formation (9). The valve of Heister, which keeps the cystic duct opening closed, prevents ascaris from moving inside the gallbladder. The short, narrow, tortuous cystic duct and obtuse angulation related to the CBD limit access of worms to the gallbladder. In contrast, the acute angulations of the cystic duct and its dilatation provide an easy path for worms to escape into the gallbladder. The elongated CBD and dilated cystic duct thus favor easier access to the gallbladder for worms. Worm load in the gut, worm size, sex and age of patients are determining factors influencing migration of a parasite towards the gallbladder (10). The current study presents gallbladder ascariasis as mostly responding to conservative treatment. Initial therapy for gallbladder ascariasis should involve conservative treatment, unless an associated disease is present or a complication arises (11).

Spontaneous passage was based on the attribute of the worm to wander and seek natural orifices. A tendency to move, prophylactic antibiotics and lodging in the gallbladder may explain the absence of cholecystitis in the patients who presented to us early. The time period for spontaneous exit varies in relation to the number of worms, presence of cholecystitis, any anomaly of the cystic duct, and presence of worm in the CBD (12). An associated worm in the CBD may hamper escape of worms from the gallbladder, and in the case of our patients, this was associated with the longer duration of a worm trapped inside this organ. A worm on USG may appear as a linear echogenic shadow without acoustics in the longitudinal view or as a circular shadow with anechoic center in the transverse view. An active worm inside the gallbladder showed typical movements on USG, which we termed as “belly dance”. Children, being prone to in-

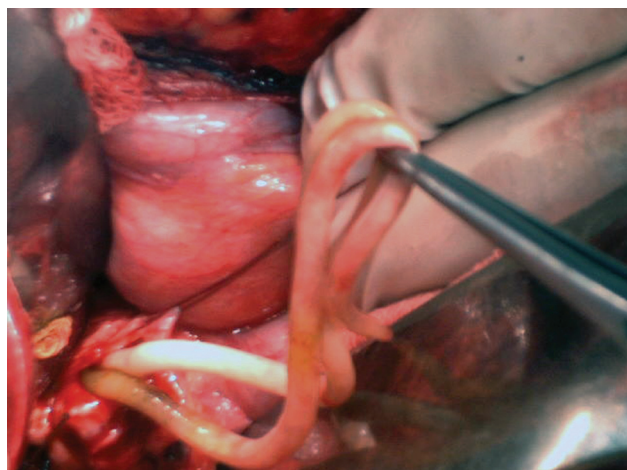


Figure 2. Ascaris extracted from common bile duct during surgery.

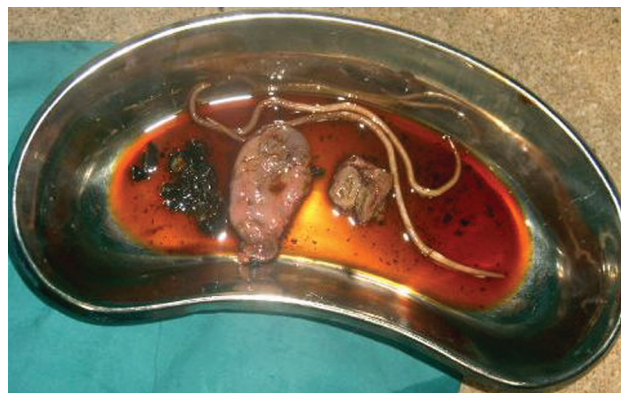


Figure 3. Calculi in the gallbladder associated with 2 ascaris in the gallbladder, which at the time of surgery were present in the CBD.

testinal ascariasis with a high load of intestinal worms, often lodge multiple worms inside the gallbladder. In our experience, USG screening alone is sufficient to diagnose the disorder, proving to be the ideal modality and readily showing parasite movement. Paralysis or death of a worm inside the gallbladder following use of antihelminthic coupled with their poor excretion in bile restricted the use of these drugs.

Indications for cholecystectomy in gallbladder ascariasis include failure of a spontaneous clearance of worms after conservative treatment, a dead worm inside the gallbladder and worm associated with calculi. Patients, with or without cholecystitis, with impacted bolus worms inside the gallbladder, anomalous cystic duct and established calculi, which impede the spontaneous exit of worms inside the gallbladder, should undergo cholecystectomy to avoid nidus for stone formation or a recurrent attack of cholecystitis. In a similarly designed survey in an endemic region of India (6), 10 of 47 patients were reported to expel the worms sponta-

neously, while 37 required surgical treatment.

In this series, two patients were subjected to emergency cholecystectomy because of multiple impacted worms that did not spontaneously exit from the gallbladder after conservative treatment. In four patients, dead worms were seen in the gallbladder, of which, one was fragmented and another (with cholecystectomy to prevent a nidus for stone formation) was calcified. Rarely, dead worms can escape from the gallbladder, as was seen in our one patient. Calculi and worms were seldom located in the gallbladder simultaneously, making the diagnosis more difficult. Given that worms can be a nidus for recurrent stone establishment, preventing spontaneous passage of a worm, cholecystectomy should be carried out, as the worm itself can induce the pathology.

In conclusion, gallbladder ascariasis is rare. Presentation can be acute acalculous cholecystitis or biliary colic. Most patients can be managed conservatively.

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