Case Report

Gallbladder Perforation Due to *Ascaris lumbricoides* in a Pregnant Woman and 6 Year Old Girl from Afghanistan: Case Report

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Received 23 Mar 2018
Accepted 11 May 2018

Abstract

Ascariasis is an important and prevalent geo-helminth infection, especially in underdeveloped countries such as Afghanistan, where public health problems and devastation of hygienic infrastructures usually lead to the higher incidence of the infection. Here, we report two cases of intestinal obstruction that accompanied with biliary ascariasis due to *Ascaris lumbricoides* in pregnant women and a 6-year-old girl from Afghanistan. Biliary ascariasis can be associated with cystic duct obstruction, gallbladder dilation, acute cholecystitis, acute cholangitis, obstructive jaundice, and biliary colic.

Keywords:
*Ascaris lumbricoides*; Gallbladder; Pregnancy; Afghanistan

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Introduction

Ascariasis is one of the most common parasitic infections, which approximately infects 25% of the global population with one million cases annually (1). Conducive climate and poor sanitary conditions in subtropical and tropical regions entail
the endemicity of the infection (2). This geo-
helmint has a direct life cycle with adults in
the intestinal lumen. High parasite burden
renders worm aggregation in the intestine and
the subsequent obstruction, volvulus or intus-
susception of the foci; also, the parasites may
migrate into the bile ducts and even perforate
the gallbladder (1, 3).

Under-developed countries such as Afghan-
istan always suffer from soil-transmitted hel-
minthiases, particularly due to weak socioeco-


nomic status, low hygienic and sanitary condi-
tions as well as insufficient public awareness
(4, 5). Hence, high prevalence of parasitic in-
fec tions like ascariasis is anticipated.

Here, we documented two case reports of
intestinal and biliary Ascaris infection in preg-
nant women and a 6-year-old girl from Af-
ghanistan.

Case Reports

Ethical consideration

Approval of ethics application was taken
from Medical Ethic Committee of Ghalib
University, Kabul, Afghanistan. All the proto-
cols used in this study were in accordance with
the approved guidelines and informed agree-
ment was taken from the patients.

Case 1

A 17-year-old woman who was pregnant
with acute abdominal pain came to the Outpa-
tient Department of Esteqal Hospital, (Kabul
City, Afghanistan) in 2017. She was from
Bamiyan Province in the center of Afghanistan.
She was suffering since eight days ago intensified
last two days and was mostly localized at
right upper quadrant of the abdomen. She also
complained of vomiting, nausea and anorexia
for one day.

Based on physical examination, the vital
signs were recorded as follows: blood pressure
100/60 mmHg, respiratory rate 22 per minute,
body temperature 37 °C and pulse rate of 80
beats per minute. Moreover, the patient had
22 wk pregnancy. Abdomen was shown to be
normal in the inspection. The bowel sounds
were present in auscultation. Tender and pain-
ful upper right quadrant were discovered dur-
ing palpation. Furthermore, dullness was re-
vealed in abdominal percussion. Other body
systems were normal at the examination.

Accordingly, the clinician claimed cholecysti-
tis as provisional diagnosis. Ultrasonography
showed that there was a long linear-shaped
structure in the lumen of common bile duct
(CBD), resembling a round worm. Laboratory
examination indicated that hemoglobin was 12
g/100 ml, white blood cells, TLC (total leu-
kocyte) 12000, many epithelial cells in urine,
12-15 white blood cells in urine, 0.94 mg/dl
total bilirubin, 0.21 mg/dl direct and 0.78
mg/dl indirect bilirubin, 26 U/L alanine ami-
notransferase (ALAT), 19 U/L aspartate
transaminase (AST) and 179 U/L alkaline
phosphatase.

By taking into consideration of sterile condi-
tion of OT (Operation Theater) and under
spinal anesthesia in supine position, after
preparation and draping, the right upper para
medium was opened, and the gallbladder was
received that two Ascaris worms were available.

Despite the CBD not dilated, foreign body
was touchable. CBD exploration was done on
the patient, and some Ascaris worms were re-
moved (Fig.1, A). After several lavage, a T-
tube was placed and stabilized. Before imple-
mentation of CBD explores, cholecystectomy
was operated on the patient, and the gallblad-
er was sutured by two chromic sutures.
Moreover, one drain was placed in the
gallbladder (lavage). Eventually, the skin layers
were restored step by step and patient was
transferred to the ICU ward after anesthesia
and performing surgery.

Case 2

A six years old female patient from Barake-
barak district, Lugar Province, west of Af-
ghanistan, was admitted to the Emergency
Department of the Indira Gandhi Hospital in
Kabul, Afghanistan, on 12 Jul 2017, with acute abdominal pain, vomiting, and abdominal expansion for 3 d. On physical examination, she was well-nourished. Her oral temperature was 37.5 °C, blood pressure was 100/60 mmHg, and the pulse was regular with a rate of 120 beats per minute. Respiratory rate was 35 per minute and there observed bilateral air entry with no added sounds but slight respiratory efforts. Cardiovascular examination demonstrated normal S1 and S2 with no murmur, and central nervous system evaluation revealed no neurological deficits. Abdominal examination revealed tenderness and rigidity in the central and mid-abdomen. Moreover, the patient had edema, vomiting, and abdominal expansion. Auscultation revealed a silent abdomen or minimal peristalsis.

At the time of admission, laboratory investigations were done. The red blood cell count was (3.4-3.8×10/μl) and hemoglobin level was 11.5gr/100ml, total leukocyte count: 13400, and bleeding time (2' 10˝), also clotting time (4' 20˝). The consequence tests of HBs & HCV were negative. Other blood tests were negative for acquired immune deficiency syndrome (AIDS), viral hepatitis and metabolic panel (M.P.) Moreover, her blood group was A/Rh⁺ and about 200 cc blood was transferred to the patient.

Abdominal ultrasound showed that, the gallbladder was normal in size and shape. Multiple alive Ascaris worms were seen within the gallbladder lumen. No lithiasis or focal mass was present. Common duct was normal, being 3 mm in diameter, whereas the normal diameter is 6 mm. Liver, kidney, spleen, and pancreas were macroscopically normal. There was not observed any para aortic lymphadenopathy as well as no free fluid in the peritoneal cavity. Furthermore, X-ray revealed the intestinal obstruction with two signs, including 1) soap bubble sign and multiple air-fluid levels and 2) railway appearance (Fig.1, B).

**Fig.1:** A: Removed gallbladder with detected worms (pregnant woman), B: Intestinal soap bubble sign and multiple air-fluid level (Right) and railway appearance (Left) and C: Removed worms from the gut lumen (the 6 yr old girl)
All these findings indicated to intestinal ascariasis. In the following, nasogastric tube, IV infusion and antibiotic therapy (Cefotaxime 500m g IV) once 30-90 min before starting the procedure and the Metronidazole 500mg/100mL infusion was performed for the patient. After that, the patient moderately became ready for operation, general anesthesia was induced and the abdomen was opened by midline short incision. Ascaris worms were mostly concentrated at the median part of the ileum, caused intestinal obstruction (Fig.1, B). Enterotomy and milking method was used to remove worms from the lumen. After dislodgment of 3.5 kg of worms from the intestine (Fig.1, C), the lumen was stitched up and the patient went to recovery with normal vital signs. Additionally, biliary ascariasis was treated with albendazole. After 3 d the patient acquired the fluid intake. Seven days postoperation, the girl was discharged from the hospital in a good condition.

Discussion

In the ascariasis abdominal pain, anorexia, nausea, vomiting, fever, dehydration and abdominal distension are the most common symptoms of the disease. Moreover, intestinal obstruction may happen due to the high burden of parasite in children. The related manifestations are pneumonia and intestinal, appendicular, hepatobiliary and pancreatic ascariasis. The confliction of gallbladder, is particularly due to wandering worms within the body in case of high parasite load in the intestine and it is also related to worm size, sex and age of the host (6-8). In pregnancy, the risk of biliary ascariasis increases because of the high level of progesterone and estrogen hormones that influence Oddi sphincter, as previously proved in animal models. These hormones facilitate the migration of worms into biliary ducts. Furthermore the mentioned hormones lead to poor draining of the gallbladder through the second and third trimesters of pregnancy (9).

The patient in this study was also in her second trimesters of pregnancy (22 wk). Laboratory tests, CT scan, MRI, MRCP (magnetic resonance cholangiopancreatography), ERCP (endoscopic Retrograde Cholangiopancreatogram) and abdominal ultrasound are beneficial for diagnosis. The ultrasound is available, sensitive, specific, safe and noninvasive for the diagnosis of biliary ascariasis in pregnant women. It can represent the worms as a long, linear or curved with no shadowing echogenic strip and reveals a characteristic movement of worms in the biliary tree. Similar finding was seen in the case of present study. Treatment of the biliary ascariasis is mainly by endoscopy or surgery instead of using anthelmintic drugs because of the low excretion of this in bile (less than 1%) (10-12). The usage of pyrantel pamoate and piperazine citrate are harmless in the late pregnancy, while mebendazole or albendazole are contraindicated. Biliary ascariasis can result in severe problems for the mother and fetus. All the associated surgical procedures may increase the risk of fetal loss and these procedures should be taken after delivery. According to reports, maternal mortality rates in pregnancy have been about 21% due to ascariasis (9). In the treatment procedure belonging to first case, removal of worms and cholecystectomy were used.

In case of bowel obstruction, dilated and air-filled intestinal loops are observed along with several air-fluid levels, indicating the railway track sign (13). Similar findings were seen in our second case. In case of jejunal obstruction with multiple masses, enterotomy and worm removal is the method of choice. Whenever the intestinal wall is thin, for instance, in volvulus cases, milking is avoided due to serosal tears and enterotomy would be better. Herein, in the second case we resected the involved section of intestine and anastomose the rest (14, 15).
Today, the control of ascariasis is not as difficult as before, since the availability of anthelmintic drugs. Public health can play a significant role in disrupting the transmission of the parasite cycle by mass chemotherapy, promotion of health education and the improvement of sanitation in Afghanistan. The main key to eliminating ascariasis in this country is the elevation of sewage system and the other organizations related to disposal of human feces.

Acknowledgements

The authors express their gratitude to Dr. Abdolqayum Sajadi head of Khatam Al Nabeein University and Dr. Ali Ahmad Makarim Bakhtiari Head of Faculty of Medicine in this university, for their supports. This work has not received any financial support.

Conflict of interest

The authors declare that there is no conflict of interests.

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