Endoscopic management of biliary and pancreatic ascariasis in Viet-Nam

Report of a series of 91 cases

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SUMMARY

Aim — Ascariasis is the most widespread helminthiasis in the world. Biliary and pancreatic involvement, frequently encountered in endemic areas, is a serious public health problem. Surgical management is often required. The purpose of our work was to assess the feasibility of emergency endoscopic treatment of biliary and pancreatic ascariasis in the Viet Duc hospital (Hanoi, Vietnam), and to evaluate outcome.

Methods — A prospective study conducted over a 3-year period included 91 patients with biliary and pancreatic ascariasis. Diagnosis was based on clinical findings and abdominal ultrasound and was confirmed by endoscopic procedures.

Results — The 91 patients, 21 males and 70 females, mean age 41 ± 17 years, underwent endoscopic procedures to retrieve the worm. The procedure was successful in 89 patients (97.8%). Mild pancreatitis occurred in four patients who underwent biliary sphincterotomy. The mean hospital stay was 3.1 days.

Conclusion — Endoscopic management of ascariasis is feasible, with a very low morbidity and a high rate of success. With this treatment, hospital stay is greatly shortened.

RÉSUMÉ

Traitement endoscopique de l’ascaridiose bilio-pancratique au Viet-Nam. A propos de 91 cas

Mai Thi HOI, Ariadne DESJEUX, Thon Tat BACH, Marc BARTHET (Gastroenterol Clin Biol 2001;25:968-971)

L’ascaridiose est l’helminthiasis la plus répandue dans le monde. Ses manifestations bilio-pancréatiques, fréquentes en zone d’endémie, posent un grave problème de santé publique, leur traitement étant trap souvent chirurgical.


Méthodes — Nous avons mené une étude prospective sur une durée de trois ans incluant 91 malades chez qui un diagnostic d’ascaridiose bilio-pancratique a été porté sur des données cliniques et échographiques puis confirmé lors du traitement par voie endoscopique.

Résultats — Parmi les 91 malades âgés en moyenne de 41 ± 17 ans, on comptait 21 hommes et 70 femmes dont 10 (14 %) étaient enceintes. L’extraction du parasite lors de l’examen endoscopique a été possible chez 89 d’entre eux (97,8 %). Une pancréatite aiguë a été observée chez les 4 malades ayant eu une sphinctérotomie biliaire. La mortalité était nulle. La durée moyenne de séjour a été de 3,1 jours.

Conclusion — Le traitement endoscopique de l’ascaridiose bilio-pancratique est de réalisation relativement aisée, et ses complications semblent exceptionnelles, permettant une durée d’hospitalisation réduite par rapport au traitement chirurgical.
Transmission occurs by the oro-fecal route. In endemic regions (China, Southeast Asia, India, South America) ascariasis is a serious public health problem. In Southeast Asia, 42 to 92% of the population is infested [1]. The prevalence of ascariasis is influenced by several factors including human population density, socio-economic conditions, sanitary conditions, agricultural development, geoclimatic conditions, and eating habits [1]. The risk of transmission is greatest in overly populated rural areas with a warm humid climate.

Generally, the parasite does not cause overt clinical manifestations. Worm migration through viscera can however provoke mechanical obstruction of the intestine or direct toxic effects. Clinical manifestations may also result from bacteria born by the worm or a combination of these different effects. Intestinal problems are by far the most common. Biliopancreatic complications including ascending cholangitis, acute pancreatitis, acute cholecystitis, intrahepatic abscess, hemobilia, or intrahepatic lithiasis result from migration of the adult worm from the gut lumen into the biliary or pancreatic ducts via the ampulla of Vater [1-5].

Currently, the diagnosis of ascariasis is often made at laparotomy or autopsy. Surgical management is the rule [1], which has a considerable impact on healthcare expenditures. More widespread use of endoscopic treatment could reduce cost, both in terms of treatment and hospital stay [4].

The purpose of this prospective study conducted in the Viet Duc Hospital, Hanoi, Vietnam over a three-year period was to assess the feasibility of emergency endoscopic management of biliopancreatic ascariasis. Outcome was assessed on the basis of clinical, laboratory and imaging criteria.

Patients and methods

Patient selection and study design

This prospective study was conducted between May 1997 and March 2000 in the Viet Duc Hospital, Hanoi, Vietnam. During this period, the diagnosis of biliopancreatic ascariasis was suspected in an emergency setting in 99 patients and later confirmed in 91 of them.

Data collected at history taking and physical examination were recorded on pre-established data sheets. Data recorded were: type, localization and hour of the pain suggesting biliary or pancreatic migration, signs of cholangitis, and presence or not of nausea and vomiting. Amylasuria was determined. A venous blood sample was also collected for the diagnosis of biliary ascaridiasis were thus 98% and positive predictive value of transparietal abdominal ultrasound (Abacus, USA). The chi-square test was used to compare qualitative variables and the exact Fischer test for 2 × 2 contingency tables. Student’s t-test or the Mann-Whitney test, as appropriate for data distribution, were applied for quantitative variables. P value less than 0.05 was considered significant.

Results

Ninety-nine consecutive patients were included in this study. Eight patients were excluded when no ascaris was found at the endoscopic examination. We thus retained 91 patients for analysis: mean age 41 ± 17 years (range: 9-87). There were 21 men (23%) and 71 women (77%) including 10 women (14%) who were pregnant [3 months (n = 2), 4 months (n = 1), 5 months (n = 1), 6 months (n = 1), 7 months (n = 2), 9 months (n = 3)]. Forty-nine patients (54%) resided in rural areas, and 42 others in urban areas. The following social and occupational categories were identified: 31 farmers (34%), 29 civil servants (32%), 29 unemployed persons (32%), and two school children (2%). Peak incidence of ascariasis was observed from April to September, the rainy season in Vietnam. Ascaris was located in the biliary ducts in 80 patients and in the pancreatic duct in 11.

Typical biliary or pancreatic abdominal pain was the predominant symptom (77 patients, 85%). Other symptoms, in decreasing order of frequency were: vomiting (49 patients, 54%), fever (28 patients, 31%), and jaundice (6 patients, 7%) (table I). The main laboratory results are presented in table II. Abdominal ultrasound demonstrated common bile duct (CBD) dilatation in all patients with biliary ascariasis. The CBD measured from from 8 to 20 mm and the parasite was visualized in 79 of the 80 patients at ultrasound. The diagnosis of biliary ascariasis was established incorrectly in 8 patients after ultrasound demonstration CBD dilatation without visualizing the parasite. These patients were secondarily excluded from the analysis. The diagnosis of ascariasis was established after one false-negative ultrasound by the endoscopic exploration performed in a patient with suggestive cholangitis. The sensitivity and positive predictive value of transparietal abdominal ultrasound for the diagnosis of biliary ascariasis were thus 98% and 91%, respectively. Similarly, the main pancreatic duct was dilated in all patients with pancreatic ascariasis, the parasite was visualized in 10 out of 11.

No parasites were observed in the stomach. In 35 patients (38%), part of the parasite was in the duodenum, the other part in the biliary (n = 25) or pancreatic (n = 10) ducts. Thirty-seven patients (41%) had a history of prior biliopancreatic ascariasis. Five of them (6%) had required surgical extraction. Endoscopic extraction had been performed in the others. Twelve patients (13%) had a history of biliary surgery for lithiasis. None of the patients included in this study had undergone prior biliary or
pancreatic sphincterotomy. Seventy-six patients (84%) had never taken any anti-parasite treatment before the discovery of biliary-pancreatic ascaridiasis.

Endoscopic extraction of the parasite was achieved in 89 of the 91 patients (97.8%). Pharyngeal anesthesia was employed in 38 patients (41.7%) and general anesthesia in 53 (58.4%). For 35 patients (38.4%), part of the worm was in the duodenum and was extracted with an forward-viewing gastroscope and a foreign body forceps (25 patients with duodenobiliary ascaridiasis and 10 with pancreatobiliary ascaridiasis) (figure 1). For the 56 other patients (61.5%) a lateral-viewing duodenoscope with a Dormia basket, or an extraction balloon (figure 2) was required. Spincterotomy was not required in 87 patients (95.6%) because the papillary orifice was patulous. Twenty-one patients (23.1%) presented a biliary fistula. Four patients presented stricture of the sphincter of Oddi but the fibrous or functional nature of the stricture could not be determined.

Mean duration of the endoscopy procedure for successful parasite extraction was 18 minutes (range : 5-40). One hundred ascarides were extracted, 91 were alive and 16 were dead. A complementary procedure was performed in 8 patients : biliary drainage with a nasobiliary drain for rinsing in 4 patients (4.4%) and endoscopic biliary sphincterotomy in 4 others (4.4%). Endoscopic treatment was unsuccessful in 2 patients who required surgical choledoctotomy with insertion of a Kehr drain.

Mean hospital stay was 3.1 days and seven patients were discharged immediately after the procedure. Anti-parasite treatment was given to all patients except pregnant women.

There were no early complications after simple extraction. One of the 4 patients who underwent complementary sphincterotomy developed mild acute edematous pancreatitis. All patients were seen at consultation 6 months after the procedure and were in good general health with no clinical sign of re-infestation.

Table I. – Clinical pattern of biliary-pancreatic ascaridiasis.

<table>
<thead>
<tr>
<th></th>
<th>Total n = 91</th>
<th>Biliary Ascaridiasis n = 80</th>
<th>Pancreatic Ascaridiasis n = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain, n (%)</td>
<td>91 (100)</td>
<td>80 (100)</td>
<td>11 (100)</td>
</tr>
<tr>
<td>Typical biliary or abdominal pain, n (%)</td>
<td>77 (85)</td>
<td>67 (84)</td>
<td>10 (91)</td>
</tr>
<tr>
<td>Nausea, vomiting, n (%)</td>
<td>49 (54)</td>
<td>47 (59)</td>
<td>2 (18)</td>
</tr>
<tr>
<td>Fever, n (%)</td>
<td>28 (31)</td>
<td>27 (34)</td>
<td>1 (9)</td>
</tr>
<tr>
<td>Jaundice, n (%)</td>
<td>6 (7)</td>
<td>6 (8)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Table II. – Clinical pattern of biliary-pancreatic ascaridiasis.

<table>
<thead>
<tr>
<th>Laboratory results</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>White cell count : mean (max)/mm³</td>
<td>9350 (21 500)</td>
</tr>
<tr>
<td>≥ 10 000/mm³</td>
<td>31/91 (34.1 %)</td>
</tr>
<tr>
<td>Serum bilirubin : mean (max)/mmol/L</td>
<td>17 (38)</td>
</tr>
<tr>
<td>Elevated</td>
<td>6/91 (6.6 %)</td>
</tr>
<tr>
<td>Serum amylase : mean (max)/IU/L</td>
<td>1300 (23 000)</td>
</tr>
<tr>
<td>≥ 1000 UI/L</td>
<td>23/89 (25.8 %)</td>
</tr>
<tr>
<td>Urinary amylase : mean (max)/IU/L</td>
<td>3226 (31 465)</td>
</tr>
<tr>
<td>≥ 1000 UI/L</td>
<td>29/38 (76.3 %)</td>
</tr>
</tbody>
</table>

Discussion

In endemic areas, _Ascaris lumbricoides_ infestation is a very widespread cause of biliopancreatic disease. It is also associated with ascending cholangitis and biliary lithiasis [3] and is responsible for nearly one-quarter of all cases of acute pancreatitis in endemic areas [6]. Although most cases of biliopancreatic ascaridiasis are diagnosed in tropical regions, particularly in...
India, cases have also been reported from temperate regions [7] and Africa [8].

In our study, the prevalence of biliopancreatic ascariasis was three times greater in women than in men (sex ratio 0.3). This is similar to findings reported by others [1-3, 9, 10]. In addition, 10 women among the 70 in our study were pregnant at the time of diagnosis [14.3%]. The high number of pregnant women may be explained by the reduction in gastric acid production during pregnancy which favors ascarius infestation. The parasite's tropism for an alkaline environment is well known [1].

Thirty-seven of the 91 patients in our study (40.7%) had a prior history of biliary ascariasis which was mostly managed medically and surgically for the others. Twelve of our patients also had a history of biliary surgery. These data are also in agreement with the literature where it is found that a large number of patients have had a history of biliary surgery before biliopancreatic ascariasis either due to lithiasis or prior ascarius infestation [1-2, 10]. Migration of the worm from the duodenum through the open Oddi sphincter may be facilitated after cholecystectomy, sphincterotomy, cholecystotomy or sphincteroplasty [1, 10]. In endemic areas, it would thus be preferable, whenever possible, to avoid sphincterotomy during the endoscopic procedure [10]. Only 15 of the 37 patients (40.5%) had been given appropriate secondary prophylaxis against ascariasis with flubendazole or a related drug (200 mg flubendazole every three months for life). Persons living in unfavorable socio-economic conditions (68.1% farmers and unemployed persons versus 31.9% civil servants in our series) are more exposed to the risk of ascariasis.

Diffuse abdominal pain, often associated with fever and vomiting, is the predominant clinical symptom when the ascarius migrates into the biliary tree [11]. Jaundice is observed in only 7% of the patients. Laboratory results often show hyperleukocytosis and elevated serum and urinary amylase without hyperbilirubinemia. Inversely, when the infestation involves the pancreas, the clinical expression is more intense with violent epigastric pain irradiating to the back. The high risk of developing acute pancreatitis in these patients with intense pain often requires emergency endoscopic treatment. When the ascarius migrates into the biliary tree, the clinical expression is less intense and endoscopic treatment may be deferred for a few hours. This difference is probably related to the smaller size of the pancreatic ducts which are less compliant.

Transpapertal abdominal ultrasound is a simple, reliable and inexpensive noninvasive technique for the diagnosis and post therapeutic surveillance of biliopancreatic ascariasis. Common findings have been described by Kuroo et al. [11]. Typically, the longitudinal image of the biliary ascarius corresponds to a hypoechogenic tubular structure which may appear straight or curved, unique or multiple, producing a « rail track » image, or mobile within the dilated biliary duct, generally without a acoustic shadowing. The transverse image visualizes a round hyperechogenic structure with a hypoechogenic center [12]. Likewise, in case of pancreatic ascariasis, the parasite may sometimes be visualized within the dilated duct [11]. The transpapillary position of the worm cannot be determined ultrasonographically so the presence of part of the parasite in the duodenum may not be recognized. If part of the parasite is in the duodenum, it can be extracted with a standard gastroscope and a foreign body forceps under pharyngeal anesthesia (35 patients in our series, 38.5%). Inversely, if the parasite is entirely lodged in the duct, extraction of the mobile worm with a Dormia basket or a balloon is more difficult, often required general anesthesia for a longer procedure. We had two endoscopic extraction failures which occurred in pregnant women. These failures were explained by mechanical difficulties due to compression of the gravid uterus making it impossible to correctly position the endoscope in front of the papilla. These failures required surgical cholecdochotomy and insertion of a biliary drain. Complications after endoscopic extraction of ascariases are exceptional ; we only had one case of acute edematous pancreatitis which resolved spontaneously among our four patients who had biliary sphincterotomy. This low complication rate allows shorter hospitalization after endoscopic treatment (about 3 days) than after surgical treatment (about 12 days).

In conclusion, endoscopic management of biliopancreatic ascariasis can be achieved easily in centers equipped with a lateral-viewing duodenoscope and adapted instruments. Adapted centers are rare in Vietnam. Nevertheless, in over one-third of our patients (38%) we were able to extract an intraduodenal parasite with an axial-viewing endoscope and a foreign body forceps ; material which is much more widely available in our country. We have demonstrated that endoscopic treatment of biliopancreatic ascariasis is a highly successful procedure with low morbidity and zero mortality. This method allows shorter hospital stay and minimal sequelae compared with surgical treatment. Endoscopic treatment is thus a very interesting option for this public health problem. Wider diffusion of this method would reduce hospital stays and costs.

REFERENCES