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□ **Brief Communication** □

A case of biliary ascariasis accompanied by cholelithiasis

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Abstract: A 43-year-old Korean woman with biliary ascariasis accompanied by cholelithiasis is reported. Her chief complaints were abdominal pain, nausea, and vomiting. She had the past history of several attacks of abdominal pain in her childhood. Biliary stones were recovered from the left hepatic duct after cholecystectomy, which contained degenerated cuticle or body wall, and numerous eggs of *Ascaris lumbricoides*. It is strongly suggested that the biliary stones were formed from the dead *Ascaris* worm(s). This is a rare case of biliary ascariasis during the recent 5 years in Korea.

Key words: *Ascaris lumbricoides*, biliary stones, bile duct, case report

In Korea, the prevalence of ascariasis has been dramatically decreased from 50-60% in 1960s to 1% or lower in 1990s owing to successful national control activities including mass chemotherapy, environmental sanitation, and health education (Seo and Chai, 1988). According to the remarkable decrease of the prevalence, surgical complications due to *A. lumbricoides* also show an evident decreasing tendency (Chai *et al.*, 1991). Of the surgical complications, biliary ascariasis is known to be the most common type and sometimes related to stone formation in the biliary tract (Maki, 1972). We report here a rare case of biliary ascariasis accompanied by cholelithiasis during the recent 5 years in Korea.

The patient, a 43-year-old Korean woman, was quite healthy until she started to experience postprandial abdominal discomfort, nausea, and vomiting. Ultrasonographic examination undertaken at a local clinic revealed stones in the biliary tract. She was admitted to Seoul City Boramae Hospital for cholecystectomy on April 17, 1990. Initial laboratory tests showed normal findings except elevated levels of sGOT (45 IU/l) and sGPT (47 IU/l), and stool examination was negative for helminth ova. She had suffered from frequent abdominal pain in her childhood.

On April 19, 1990, an explorative laparotomy was carried out through a right subcostal incision and cholecystectomy was done. The gallbladder was inflamed without wall thickening, and the common bile duct was dilated containing multiple black stones. In preoperative cholangiography, obstruction of the left hepatic duct was observed while the right duct was patent (Fig. 1). Sludge, about 1 ml in volume and yellowish brown in color and friable, was found in the left hepatic duct and taken as much as possible, but complete removal could not be done because of the limitation of manipulation. Postoperative T-tube cholangiography revealed patent tubular dilatation of the left hepatic duct suggestive of prior obstruction by a linear, tubular mass, but its distal end remained still obstructed (Fig. 2). A T-tube was left in the common bile duct for further drainage. The resected gall-

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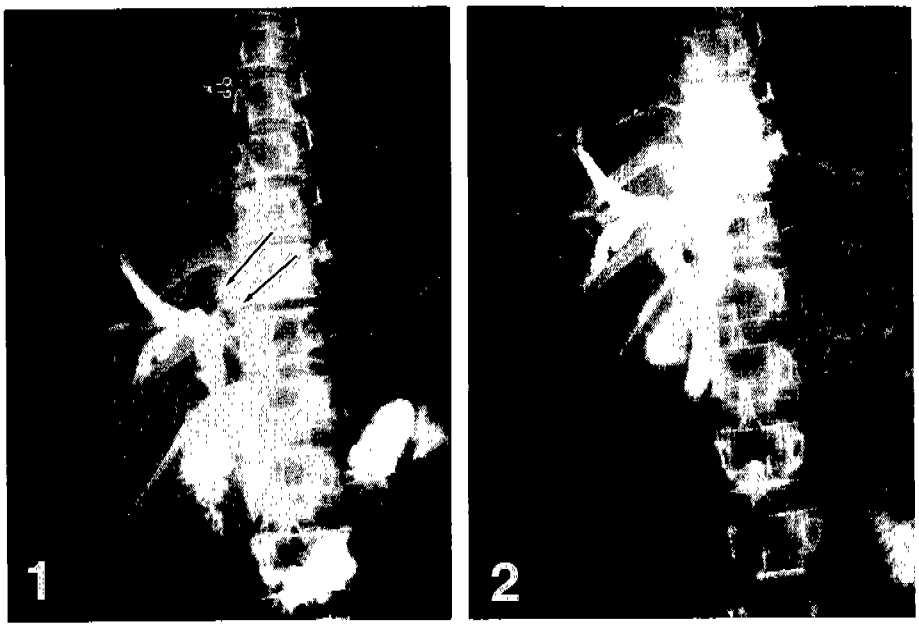

Fig. 1. Preoperative cholangiogram showing obstruction of the left hepatic duct (arrows) and the patent right duct. **Fig. 2.** T-tube cholangiogram after removal of sludge from the left hepatic duct. Obstruction of the left duct was somewhat relieved to show tubular dilatation, however, complete patency of the duct is not recognizable.

bladder revealed signs of chronic cholecystitis, and microscopic examination of the sludge showed desquamated biliary epithelia, and inflammatory cells especially eosinophils and neutrophils, around the severely degenerated, bile-tinged cuticle of a huge nematode (Fig. 3). In other areas, numerous eggs of *A. lumbricoides* (fertilized), showing an embryonic cell and three layers comprised of protein coat, chitin layer, and lipoid layer were observed (Fig. 4).

Although invasion of *A. lumbricoides* worms into the biliary tract or other organs is believed as a rare incidence even in heavily infected cases, numerous such cases have been reported in many areas of the world. Migration of *Ascaris* to various organs was suggested to occur when the worms are under unfavorable conditions contributed by one or more of following factors; increase or decrease in gastric acidity, drinking of alcohol or ice water, administration of anthelmintics or anesthetics, and accelerated intestinal peristalsis due to high fever or intestinal catarrh (Maki, 1972).

Biliary ascariasis is a frequent cause of biliary disease in adults (Khuroo *et al.*, 1985 & 1987) and of acute abdominal emergency in children (Davies and Rode, 1982; Chu, 1984) in countries where ascariasis is highly prevalent. Clinical symptoms are abdominal pain mimicking biliary colic, nausea, vomiting and jaundice (Maki, 1972; Quintos *et al.*, 1990). Among the diagnostic techniques, sonography is a simple, rapid and noninvasive method for the diagnosis and follow-up of patients (Khuroo *et al.*, 1987). Treatment should be surgical, although endoscopic removal of the worm(s) is sometimes possible.

It is well known that *Ascaris* infection in the biliary tract is one of the important causes of biliary stones, and the stones due to *Ascaris* are most frequently found in the common bile duct (Maki, 1972). In the present case, the stones and sludge were found not only in the common bile duct but in the left hepatic duct. Although it is not certain that both of them were originated solely from the dead *Ascaris*, it was evidently shown that the sludge in the left hepatic duct was mainly composed of degenerated cuticle, body wall and eggs of *Ascaris*. This suggests strongly that the stones in the common bile duct also related with

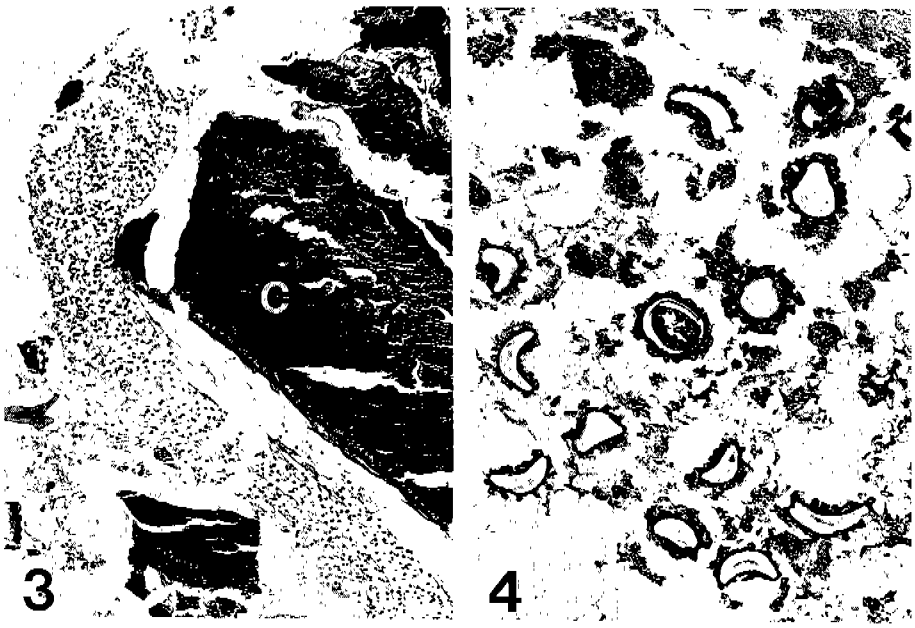

Fig. 3. Microscopic view of the sludge showing degenerated cuticle (C), inflammatory cells chiefly composed of eosinophils and neutrophils. **Fig. 4.** Another area showing sections of parasite eggs with an embryonic cell, the albumin layer and the chitin layer, which are characteristic of fertilized *A. lumbricoides* ova.

Ascaris infection.

The stones due to *Ascaris* are known to be pigment stones rather than cholesterol ones (Harrison-Levy, 1962). Several factors were suggested to favor *A. lumbricoides* as a nidus for stone formation, most of which are derived from the constitutional properties of the eggs (Raney *et al.*, 1970). One property for growing biliary pigment stones is the albuminoid membrane that is uneven and so highly cohesive as to facilitate the precipitation of calcium carbonate crystals on the surface of the eggs (Asakura, 1956a & b). Others are the chitin layer that seems to provide an adequate support for the growth of stones, and component elements identical with those comprising the bile (Asakura, 1956a & b). The cuticle that may persist for a long time without putrefaction may also serve as a nidus for accretion (Sato, 1955). In Japan, the liver fluke, *Clonorchis sinensis*, was also reported to be related to gallstone formation, although the frequency was, compared with *A. lumbricoides*, not so high (Maki, 1972).

Chai *et al.* (1991) reviewed literatures on biliary and other surgical complications of ascariasis during 1955-1989 in Korea. They suggested a significant correlation between the national egg prevalence and proportion (%) of biliary ascariasis cases either among all biliary surgical patients (parameter A) or among all biliary stone patients (parameter B) in general and university hospitals. The incidence, *i.e.*, parameter A or B, was proposed to be a useful index for a decrease of ascariasis prevalence in a community or a barometer of success in the control of ascariasis. In Korea, the parameters A and B became almost zero after 1987 (Chai *et al.*, 1991), therefore, the present case is considered as an unusual incidence in recent years.

Ascaris invasion into the biliary tract may cause various complications in the hepatobiliary system such as pathologic changes in the muscle of the sphincter Oddi, stone formation, perforation of gallbladder, and liver abscess formation (Maki, 1972). Therefore, it seems important to consider the possibility of biliary ascariasis when the doctors in endemic areas of *Ascaris* treat patients of biliary diseases.

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=국문초록=

담석증을 동반한 담도회충증 1례

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복통과 담석을 주소로 서울시립 보라매병원에 입원한 43세 여자 환자가 수술 후 담석증을 동반한 담도회충증으로 진단되었다. 환자는 어릴 때부터 '횟배'를 자주 앓아왔으며 입원 20일 전부터 식후 복통과 오심 및 구토 증세를 나타내었고 개인병원에서 시행한 초음파 검사에서 담석이 발견되어 수술을 받기 위해 입원하였다. 입원 당시 간기능 검사상 SGOT 및 SGPT는 다소 증가되어 있었고 대변검사에서 기생충의 충란은 검출되지 않았다. 환자는 담석증 진단 하에 담낭절제술을 시행받았다. 수술 전 담도조영 검사상 좌측 간내 담도는 막혀 있었으며 수술 후 어느 정도 호전되었으나 잔존 오니(sludge)로 여전히 막혀있는 상태였다. 광학현미경 검사상 담낭은 만성 담낭염의 소견을 보였고 오니에서는 심하게 변성된 회충의 충체와 비교적 잘 보존된 충란이 함께 관찰되었다. 이 환자의 경우 담석 형성은 담관 내로 기어 들어간 회충이 오랜 기간 경과하면서 변성되어 담석의 핵(nidus)으로 작용하였을 것으로 추측되었다. 이 환자는 최근 5년 동안 국내 문헌상 매우 드물게 발견되는 담도 회충증의 증례이었다.

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