Significance of Peritoneoscopic Examination, Direct Cholangiography and Cytological Examination of Aspirated Bile in the Diagnosis of Biliary and Pancreatic Malignancies

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KIMURA, R., WAKUI, K., ISHIOKA, K., TADAKI, H., YAMAGATA, J., TAKEDA, T., MIURA, K., OTSUKI, M., SUGAWARA, T. & YAMAGATA, S. Significance of Peritoneoscopic Examination, Direct Cholangiography and Cytological Examination of Aspirated Bile in the Diagnosis of Biliary and Pancreatic Malignancies. Tohoku J. exp. Med., 1976, 118 (Suppl.), 145-148 — The roles played by peritoneoscopic examination, direct cholangiography and cytological examination of aspirated bile at the time of direct cholangiography were studied in 140 patients with various biliary and pancreatic diseases. Both peritoneoscopic and cholangiographic examinations were important in detecting the lesion, and cytological examination was effective in deciding the nature of the lesion. The detection rate of the cancer cells in aspirated bile depended upon the location of aspiration in relation to that of the lesion. The closer the distance the better was the detection rate. The combined use of these three diagnostic methods contributed to correct diagnosis.

peritoneoscopy; direct cholangiography; cytological examination of bile; cancer of biliary tract and pancreas

METHODS AND MATERIALS

During the period of 7 years from 1965 to 1971, 140 patients were admitted to the 3rd Department of Medicine, Tohoku University Hospital for the examination of possible cholangial or pancreatic diseases. In these patients, both peritoneoscopic examination and direct cholangiography were carried out. Direct cholangiography was done either under direct observation of the puncture site through a peritoneoscope as it was done in

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the majority of patients, or blindly as the percutaneous direct cholangiography. Direct cholangiography thus attempted was successful in 133 patients. At the time of direct cholangiography, attempt was also made to obtain bile. Aspirated bile was then examined cytologically. The cytological examination was done in 118 patients. The peritoneoscopic examination was done using Machida SL-C type fiber-peritoneoscope. Two different types of needles were used for direct cholangiography. One had a diameter of 0.8 mm and was 20 cm in length, and the other had a diameter of 0.6 mm and a length of 15 cm.

Various methods of the direct cholangiography are illustrated in Fig. 1. Method A, the transhepatic puncture of the intrahepatic biliary duct is the safest way of the puncture and this is used in most cases in this department. Method B is transhepatic-cholecysto-puncture. This can be tried in patients with biliary bladder diseases with patent ductus cysticus. Method C is direct puncture of the bladder through its free wall and the risk of bile leakage is highest in this method. Method P is essentially the same as the method C but here a specially made clip is applied to the location of the puncture to prevent bile leakage. The method C and P can only be used in selected cases. Percutaneous transhepatic direct cholangiography was done in upper prone position. The needle is inserted at about the crossing point of right midaxillary line to an abdominal line at the level of xyphoid and pushed horizontally under x-ray TV observation with constant injection of a small amount of contrast media, until the point is reached where the flow of the contrast media shows that the needle point is placed in a biliary tract. At each of these procedures an attempt was always made to obtain bile. Aspirated bile was centrifuged immediately, and smear was made and stained by May-Giemsa staining or Papanicolau’s method. The final diagnosis of the examined cases was made on the basis of the surgical or autopsy findings.

![Fig. 1. Various methods of the direct cholecyst-cholangiography.](image)

**Results**

**Peritoneoscopic diagnosis.** In patients with malignant diseases of the bile duct system and pancreas, the peritoneoscopic findings were those of obstructive jaundice and no further conclusive clue could be obtained through the peritoneoscopic examination alone. The correct diagnosis was arrived at in only a few advanced cases. Thus the peritoneoscopic diagnosis was correct in 10 of 14 patients with gall bladder cancer, 6 out of 20 patients with common bile duct cancer, and 6 out of 25 patients with pancreatic cancer.

In patients with cholelithiasis, the presence of stone or stones in the bladder could not be directly detected by the peritoneoscopic examination. However, the peritoneoscopic characteristics of cholecystitis were usually taken as the sign of cholelithiasis. In this way, in 43 out of 71 patients with cholelithiasis the diagnosis
was correctly made peritoneoscopically.

**Direct cholangiographic diagnosis.** The location of the lesion was more easily diagnosed by this method than by peritoneoscopic examination. Interpretation of the nature of the lesion, however, was difficult in some instances. Correct diagnosis was arrived at by this method in all the 41 patients with cholelithiasis, 10 out of 11 patients with common bile duct stones, all of 8 patients with combined cholelithiasis and common bile duct stones, in 12 of 14 patients with gall bladder cancer, in 18 out of 20 patients with common bile duct cancer and in 20 out of 24 patients with pancreatic cancer. Misinterpretation of the lesion detected occurred in one out of 11 patients with common duct stone which was mistaken as common duct cancer. 2 out of 14 patients with gall bladder cancer were mistaken, one for cholecystitis and the other for common duct cancer. 2 patients with common duct cancer were mistaken for common duct stones.

**Cytological examination of aspirated bile.** The results are summarized in Table 1. Cancer cells were detected in 10 out of 12 patients with gall bladder cancer, in 4 out of 11 patients with common duct cancer, and in 5 out of 11 patients with hepatic bile duct cancer. It should be noted that the cancer cells were detected in 10 out of 24 patients with cancer of the biliary tract when their duodenal juice was examined.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Aspirated bile</th>
<th>Duodenal juice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases examined</td>
<td>Positive for cancer cells</td>
</tr>
<tr>
<td>Cancer of pancreas</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Cancer of bile duct</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Cancer of biliary bladder</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Cancer of duodenum</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Benign diseases of biliary tract and pancreas</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>118</td>
<td>20</td>
</tr>
</tbody>
</table>

**DISCUSSION**

It is obvious from the results that the three diagnostic methods investigated here have their own merits and demerits. However, no examination can be replaced by another examination. Peritoneoscopic examination was especially effective in judging the extension of cancer and useful in making the decision of the surgical approach. However, the peritoneoscopic findings in malignant diseases of the pancreato-biliary tract area were not specific and circumstantial or indirect as the best. In only few advanced cases, the diagnosis of malignancy can be made directly by this method. Direct cholangiography also gives indirect evidence. Although serial x-ray pictures taken at the time of direct cholangiography can be analyzed objectively, the analysis depends upon the flow of contrast
media and the shadows created by the contrast media. The nature of the lesion can only be supposed from previous clinical experiences. In this regard, cytological examination is thought to be the most reliable method for determining the nature of the lesion. Here, the presence of the malignant cells conclusively settles the diagnosis of malignancy. However, negative cancer cell in bile does not rule out malignant disease. The detection rate of the cancer cells in the bile appears to be related to the distance between the location of aspiration and that of the lesion. The nearer the location of the lesion to that of aspiration, the better the detection rate. This is clearly demonstrated when the results of the cytological examination are compared between aspirated bile and duodenal juice in various malignant diseases of the bile duct system and pancreas. The detection rate of the cancer cells in bile aspirated from the gall bladder in gall bladder cancer was found to be higher than that found in the duodenal juice (Table 1). Cancer cells were detected in aspirated choledochal bile in approximately 40% in bile system cancer and in 6.6% in pancreatic cancer. On the other hand, the cancer cells were found in duodenal juice in 41.6% in bile system cancer and in 32% in pancreatic cancer. It should also be pointed out that in 9 patients with duodenal cancer, cancer cells were found in duodenal juice in all patients. The selection and consideration of the location of bile aspiration are therefore important in the cytological examination.

Thus, these three methods have their own shortcomings. To cover the shortcomings of each diagnostic method, the combination of the methods would be effective. Indeed, when these three methods were applied in 10 patients with malignant diseases of the biliary tract, malignancy was detected in all of them.

References