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PERFORMING PERCUTANEOUS TRANSPHEPATIC CHOLANGIOGRAPHY USING SIMPLE X-RAY EQUIPMENT

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SUMMARY

Percutaneous transhepatic cholangiography (PTC) is a valuable procedure used for diagnosing diseases of bile duct. It is simple to perform, safe, and inexpensive. The only equipment needed to perform PTC is a simple x-ray machine and puncture needle 14cm long and of 0.1cm core diameter. As long as the puncture point is selected accurately and operation is performed correctly, an excellent image can be achieved. This procedure can therefore be used in developing countries where expensive, modern technology is not available. We report a case of a 50 year old female patient in whom the procedure was successfully used.

CASE REPORT

A 50-year-old, female patient was admitted to Abdullah Mzee Hospital on March 20th, 1998 because she had been suffering from upper abdominal discomfort, abdominal distension, loss of appetite, weight loss and itchy sensation for a period of three months. Upon physical examination she was found to have dark urine and pale stool. She was emaciated, deeply jaundiced and her skin showed prurigo. A slightly hard, roundish mass measuring 5x5 cm was felt in the right upper quadrant of her abdomen. The liver was not palpable at the right subcostal margin. She was tentatively diagnosed as having obstructive jaundice and an upper abdominal mass of uncertain origin, probably due to cancer of the gallbladder or pancreas.

On March 26th, 1998 a percutaneous transhepatic cholangiography (PTC) was performed using a simple 75mA x-ray machine.

The patient lay on the x-ray examination bed, in supine position, with the right arm held over her head. The operator outlined the liver by palpation and percussion.

The puncture point was located where the lower third of the liver (mostly at the right side between 7th and 8th intercostal space) fell between the midaxillary and anterior axillary lines. Aseptic manipulation was performed, then using local anaesthesia, the needle (14cm long and 0.1cm core diameter) was inserted horizontally towards the xiphoid process.

When the needle was in about 10cm, the needle core was removed and connected to a 5 cc syringe. Suction was performed while slowly moving the needle out. Finding bile during suction meant that the paracentesis was successful. Immediately 30-50% urografin was ejected until the patient felt bloated in the upper right abdomen (about 50-60ml) and x-ray film taken. The film was developed. If the results were satisfactory the contrast medium and bile were aspirated and then the needle pulled out.

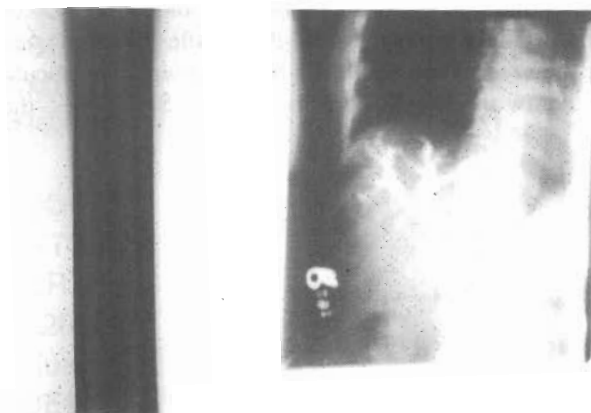
The x-ray showed that both the intrahepatic and extrahepatic bile ducts were dilated. The cystic duct could only be seen dimly because dosage of contrast media was

not enough. The terminal common bile duct was obstructed and its appearance had changed into an eccentric and conular one. There was no markable displacement of the common bile duct.

The x-ray image obtained by PTC was suggestive of a diagnosis of carcinoma of the head of pancreas complicated by obstructive jaundice (Figure 1).

Figure 1

The x-ray image obtained by PTC



On March 30th, 1998 we performed an operation on the patient using exploratory laparotomy and fistulisation on both the cystic and common bile ducts. This operation confirmed the diagnosis of cancer of the head of the pancreas, and allowed us to determine that the abdominal mass had led to compensatory enlargement of the gallbladder, due to biliary tract obstruction.

## DISCUSSION

Jaundice is a condition commonly seen in clinics. It may be caused by a variety of diseases including lesions of the liver, biliary tract and pancreas, especially in surgical biliary tract diseases such as biliary stones, carcinoma, inflammatory bile duct strictures, parasites, and in pathological changes of duodenal papilla. PTC is a valuable technique in diagnosing obstructive and non-obstructive biliary tract diseases. Not only can it provide an excellent view of the biliary tree, expose the causes of obstruction, and show the location and range of the obstruction, but it can also guide a surgeon to select a suitable operating method. PTC is a breakthrough in radiographic image diagnosis of the biliary surgical diseases.

Usually, PTC puncture point is chosen under x-ray screen with an operator monitoring the dynamic flow of contrast medium and its distribution under fluoroscopic screen. We were however, unable to achieve an excellent image result, without using an x-ray screening indication device. We performed PTC using only 75mA x-ray machine and puncture needle with a core. This PTC technique is simple, safe and reliable, and therefore should be used in all basic hospitals.

When performing a PTC, the patient should breath lightly. Pre-operation injection of dolantin and luminal may be used to relieve the patients stress and prevent heavy breathing. If not, the puncture needle is likely to hurt or cut the liver tissue or pierce into pleural cavity. If the liver is enlarged and moved downward, the puncture point should move down one intercostal space correspondingly (between the 8th and 9th intercostal space). If suction shows blood or lack of bile, a slight adjustment of the needle direction may be required. When you feel a break-through, you should withdraw the needle core for suction. Sometimes, the

bile is too thick to pass through a thin needle into a syringe all at once, and other times the bile is thin and light in colour (like white mucus), thus it is liable to be mistaken for other liquids. Sometimes blood clots or fine sandstone blocks the needle hole and you have to remove it with the needle core.

A high concentration of the contrast medium is not desirable because it may cover up pathological changes. If the biliary obstruction is incomplete, there is no need to draw off the bile and the contrast medium. Just pull out the puncture needle and take pictures from different positions according to the patient's needs. If an instrument for measuring pressures is available, you can take the biliary pressure. The drawn off bile can be used for bacteriological test and defluxion cells test.

The whole PTC process must be stopped or another puncture point selected if puncturing has been done six to eight times without getting the desired results. In the case of biliary duct infection, you may inject antibiotics into the biliary tree for local treatment. If the patient develops a common and temporary fever after the operation, it does not need to be managed.

PTC is an invasive means or traumatic test however, as long as you correctly choose the puncture point, you successfully apply the paracentesis method and the patient avoids heavy breathing, you may save the patient from such complications as bile leak, bleeding in peritoneal cavity and pneumothorax.

## APPENDIX

The details of the X-ray machine we used are as follows:

Manufacturer Ralco s.r.l. lissone Italy

X-ray rating up to 110 Kvp

Min. inherent filtr. Al<sub>eq</sub> 1mm

Supply volts 24AC/DC

Model R 100 ET

Serial no 1528

Date of manufacture: February 1990