

By reason of aggeravated disease, the patient was sent to our hospital when she was in his fifth month of birth. Based on the observations that the total serum bilirubin value was 20 mg/dl and the feces had a low bile concentration, the authors diagnosed her to be a case of congenital atresia of the bile ducts. Results of surgical operation performed on this case belonged under Type IV according to Gross' classification.

In view of this particular case, the authors wish to warn against ready adoption of the diagnostic name "giantcell hepatitis" due to the pathologic tissue study as the clinical diagnostic name without forming a comprehensivs judgement by taking into account other clinical findings.

## 5. CHOLESTASIS

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I will describe the outline of the surgical management of cholestasis and also few points of pathophysiology, which were observed and confirmed during the operation.

1) Surgical management for cholestasis is mainly subjected to the extrahepatic obstruction of the bile duct causing hindrance to the bile flow.

The subject on cholestasis which occurs secondary to cholelithiasis shall not be discussed since this condition can be easily treated by the operative intervention of cholelithiasis itself.

A total of 157 clinical cases, of which 68 cases were experienced from 1955 to 1964 by the staff members at the first department of surgery of Kyoto University Hospital and also 89 cases which were done exclusively by the author and his colleagues at the second surgical department of Kanazawa Medical School from 1959 to 1965, are reviewed in this paper.

Diseases discussed here are mostly the cases of obstructive jaundice due to malignant tumor arising from the areas surrounding the extrahepatic biliary tree (142 cases and 90.4%) such as cancer of the common duct, pancreas, ampullary region and the region of hepatic hilum and also metastatic gastric cancer. In addition to these diseases, the less numbers of benign ones (15 cases and 9.6%), namely postoperative biliary fistula, congenital biliary atresia and idiopathic choledochus dilatation, are included.

At first, the operative methods are classified roughly into two groups, namely the one in which extrahepatic bile duct can be used and the other in which not.

In the first group, the gallbladder, common duct and common hepatic duct are used to make anastomosis with the jejunum or duodenum. Besides, in some of the cases, either one of the left or right branch of hepatic duct is utilized.

In the second group, for the cases in which the extrahepatic bile duct is not able to be used, the method of inserting T tube into the bile duct, hepatoenterostomy or transhepatic intrahepatic bile duct drainage are applied instead.

In giving more detail of these each operative method, the anastomosis between the gallbladder and the intestinal tract can be constructed with much ease technically. This type of anastomosis has been used most frequently in the past since this method has given satisfactory results to relieve jaundice when it is used on indicated cases. Jejunum has been used most frequently as a partner in this type of anastomosis.

There are two ways in this type anastomosis, one of which is the cholecystojejunostomy supplemented by Braun's anastomosis and the other is so called Roux en Y type of anastomosis. Former method is much simpler technically, but the latter will be the method of choice theoretically from the point of preventing ascending infection. It is not necessary to be too conscious of the Roux en Y anastomosis technique, since there has been no significant difference observed between these two types of anastomosis as far as the incidence of ascending infection is concerned.

Cholecystojejunostomy itself is also an impractical procedure in the cases of either the presence of cystic duct obstruction or if the cystic duct is very long and jointed to the common duct near to opening of the duodenum. Application of the gallbladder at the time of reconstruc-

tion of bile duct following pancreatico-duodenectomy should be avoided for several reasons.

In these cases mentioned above, choledochenterostomy has been performed using common bile duct instead of gallbladder. Common bile duct is usually anastomosed with either the jejunum or duodenum.

The author prefer to use the duodenum whenever the duodenum can be utilized for anastomosis. Taking the later cases of 1965 into account, the ratio of ascending infection following cholecystojejunostomy is 21.6% and that after choledochoduodenostomy is 13.3%. From the consideration of few other reasons, the author believe that choledochoduodenostomy seems to be the most commendable one.

We have experienced the cases in which anastomosis was performed between one of the either, left or right branch of hepatic duct and the jejunum or common bile duct.

The next condition where the extrahepatic bile duct is not able to be utilized indicates the cases of tumor located too close to the hepatic hilum not only making it impossible to resect, but also interfering the anastomosis between the intestine and the extrahepatic bile duct at the side of liver because of the extension of tumor. For these cases, insertion of T tube into the hepatic duct (12 cases), hepatoenterostomy or hepaticoenterostomy (15 cases), or transhepatic intrahepatic drainage (3 cases) are the methods of choice.

Our basic principle of managing these conditions are, of course, leading the bile into the intestinal tract if possible. Theoretically, hepatoenterostomy is satisfactory one, but the results are not uniformly good in each cases. Once ascending infection does occur with this method, there is no effective therapy and also the permanency of its effectiveness is quite limited.

Therefore, recently the method of inserting T tube into the hepatic duct has been adopted on all possible cases. When the bile duct can be found T tube is inserted into its lumen and the superior limb is passed into the dilated bile duct through the area where the tumor is located, the inferior limb is inserted towards the duodenum and the middle limb is brought to the outside of the body.

Postoperatively, the bile should lead into the duodenum as much as possible by clamping the middle limb and irrigate the tube properly to prevent the obstruction of bile duct and ascending infection.

In cases in which those two methods are considered not suitable, the method of the transhepatic intrahepatic bile duct drainage has been used as the preferable method.

Lastly, for the cases of benign obstruction of the bile duct due to technical error at the time of operation of cholelithiasis, the author also obtained satisfactory results by doing reconstruction of the bile duct. Technically, the operation for these cases are relatively difficult one, but the extrahepatic bile duct is able to be utilized in all cases.

For the 5 cases of idiopathic choledochus dilatation, anastomosis between the dilated portion of the common duct and the duodenum or jejunum was carried out successfully, therefore resection of the dilated portion of bile duct is certainly considered to be unnecessary.

2) An experimental study was performed to determine what amount of hepatic tissue performing bile excretion is required in order to avoid the occurrence of jaundice. From the result of the experiment, it is assumed that there is a possibility to reduce jaundice if drainage of stagnant bile, excreted from comparatively healthy hepatic tissue weighing  $1/5 \sim 1/6$  of the entire liver, is carried out.

3) Concerning the relationship between portal blood supply and bile production, the influence on bile excretion after the ligation of portal branch supplying to the area having no bile drainage was studied.

a. It is clarified by the experiment of bile duct ligation on one side and concurrent portal branch ligation on the other side that liver parenchyma, even though deprived of portal blood supply, is possessed of the ability to excrete all the bilirubin including that reabsorbed from the hepatic area which has biliary obstruction.

b. From an experiment determining the amount of bilirubin excreted from 30% area of entire hepatic tissue, it was confirmed that this amount increased considerably if the ligation of portal branch to the other hepatic area was performed. This effect of portal branch ligation is presumably due to the augmentation of the portal blood flow to the area where the excretion of bilirubin is being estimated.