

# Transnasal bile duct catheterisation after endoscopic sphincterotomy

## Method for biliary drainage, perfusion, and sequential cholangiography

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**SUMMARY** We describe a method for leaving a catheter in the common bile duct for several days, even weeks, after endoscopic sphincterotomy. This provides reliable biliary drainage, and permits perfusion of the duct with simple fluids or solvents. It reduces the need for instrumental stone extraction and for repeated endoscopy and cholangiography to check whether stones have passed, since transnasal cholangiograms can be performed simply and repeatedly without discomfort.

Endoscopic diathermy sphincterotomy allows removal of stones from the common bile duct (Koch *et al.*, 1977; Safrany, 1977). The technique of sphincterotomy itself is established, but there are several alternative methods for removing the stones. Stones may be actively extracted with balloon catheters, wire baskets, or Teflon loops passed through the duodenoscope. Active extraction immediately after sphincterotomy, however, probably increases the risk of bleeding from the raw surface, and is usually unnecessary as most stones pass spontaneously within a few days. Thus many groups have adopted an expectant policy, using active extraction techniques only if stones are still present on repeat endoscopic cholangiography at one to two weeks. We have evolved a method which reduces the need for repeat endoscopy, and which has other potential advantages.

### Method

Simple Teflon tubing (1.7 mm external diameter) is prepared in 3 m lengths, with additional side holes near the tip. Immediately after sphincterotomy, a tube filled with contrast material is passed through the duodenoscope and deep into the biliary system. A long guide wire aids manipulation of the tube, and makes it easier to see on fluoroscopy. The tube tip should be looped within the common hepatic duct; this is easy to achieve when the duct is dilated, and is facilitated by pushing the tube onwards, with the

end of the guide wire about 5 cm from the tip of the tube. The endoscope is then withdrawn slowly over the tube while checking the position repeatedly by fluoroscopy. Care should be taken to avoid leaving redundant loops in the duodenum, but some excess in the stomach is advantageous. After removing the endoscope, the proximal end of the tube is re-routed from the mouth to the nose. A standard nasogastric tube is passed to the pharynx, grasped with forceps and brought out through the mouth. The biliary tube is then threaded backwards through it. The nasogastric tube is withdrawn and discarded, and the biliary tube is taped to the cheek. This re-routing can be uncomfortable and should be performed while the patient is still sedated.

We currently allow free bile drainage into a bag for the first two days after sphincterotomy. Bile cultures are taken. A 'transnasal cholangiogram' is performed on the second or third day (Figs 1 and 2). Head down and erect radiographs are often necessary to be certain that stones have passed after sphincterotomy, as the biliary system usually contains air. Herein lies another advantage of tube cholangiography over repeat ERCP: the patient is not sedated and can be moved and tipped easily and safely for optimal radiography. If the stones have passed, the tube is removed and the patient is discharged. If stones are still present, we perfuse the duct with dextrose saline solution *via* the nasobiliary tube at a rate of 3 l per day for about three days before repeating the cholangiogram. If this again shows stones, the patient is either submitted to further biliary perfusion (with dextrose saline or sodium cholate) or to repeat endoscopy for basket extraction.

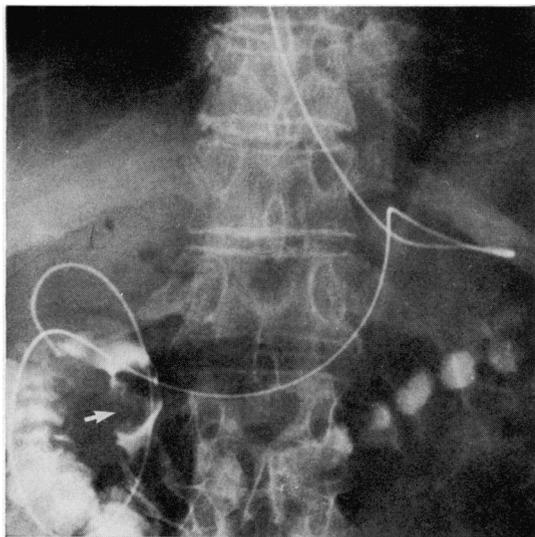


Fig. 1 Transnasal cholangiogram showing the tube correctly placed with the tip looped in the common hepatic duct above a collection of stones (arrowed).

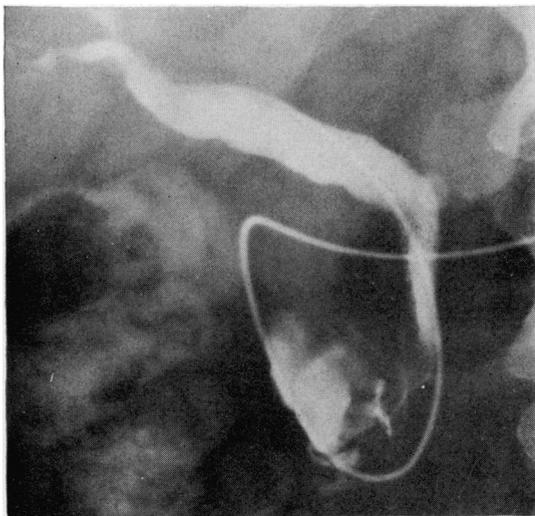


Fig. 2 Bile duct clear of stones after biliary perfusion.

When a second endoscopy is necessary, this is usually done with a larger instrument and a big basket.

### Results

During the eight months up to March 1978, transnasal biliary catheterisation was attempted in 35 patients immediately after sphincterotomy. In two

patients the tubes were inadvertently dislodged on removing the endoscope, and in seven others they fell out of the duct before the first cholangiogram; all these failures occurred early in our experience. All tubes remained in place if the tip was initially sited within the intrahepatic tree or looped in the common hepatic duct (Fig. 1). Patients tolerated the tube well for periods of up to two weeks and were able to eat and drink normally.

After sphincterotomy most of the bile usually drains through the enlarged orifice. Drainage *via* the tube varied from 0-450 ml/24 h. Cultures were taken from 14 of the last 19 patients; pathogenic organisms were grown from 12 patients, despite the fact that all were given parenteral gentamicin and ampicillin starting immediately before sphincterotomy. In two patients the cultured organisms were resistant to this antibiotic combination, and the antibiotics were changed. No patient had any clinical evidence of infection.

The first transnasal cholangiogram was clear of stones in nine of the 26 patients with successful catheterisation, and in eight other patients at a subsequent examination (Fig. 2) after dextrose saline perfusions, which were always well tolerated. We saw no evidence of reduction in stone size during sodium cholate perfusions, but they were rarely tolerated for more than a few days because of uncontrollable diarrhoea and vomiting.

### Discussion

Transnasal biliary catheterisation is a simple and well tolerated adjunct to endoscopic sphincterotomy. It is now used in most patients who do not already have a T-tube drain, mainly because of its convenience as a route for sequential cholangiography. It also seems sensible to drain infected bile (from above stones) and to take repeated bile cultures. The value of the perfusion techniques is, however, unproven, and further assessment is necessary. It is possible that the presence of a tube might occasionally even hinder stone passage. There seems little risk of it interfering with the pancreatic duct orifice.

Where stones exceed 15 mm diameter on radiograph film—that is approximately 12 mm real size—the chances of removing them endoscopically are reduced, and the risk of complications is increased. A perfusion technique to reduce stone size would be an asset. Sodium cholate has been poorly tolerated, presumably because it drains rapidly through the sphincterotomy; a less toxic agent is being evaluated. Dissolving agents might be more effective if used through a transnasal tube *before* sphincterotomy (for one to two weeks). We have not tried this for fear of inducing cholangitis, but a double lumen

catheter system would allow simultaneous biliary infusion and drainage; the same method could be applied to patients with cholangitis and septicaemia, providing drainage and a route for instillation of antibiotics.

**References**

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