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BILIARY

Percutaneous transhepatic plastic stent removal from the biliary tract prior to metallic stent placement

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SUMMARY. **Objective:** To present our experience in transhepatic removal of occluded or misplaced plastic stents from the biliary tree, prior to metallic stent placement.
Design: We removed occluded plastic stent transhepatically in five patients with the help of a Nitinol Goose Neck Snare. In one case we transhepatically pushed a misplaced plastic stent to the duodenum with help of a flexible forceps. The plastic stents were inserted at least 2–3 months before occlusion. In all cases, one or two metallic stents were subsequently placed.
Results: The procedure was completed without any technical problems. The patients felt moderate pain and had no bleeding, pyrexia, sepsis or any other complication related to the procedure. After the placement of the metallic stents, bilirubin level decreased rapidly and jaundice was relieved.
Conclusion: The transhepatic removal of plastic stents is an alternative to endoscopy. If the occluded endoprosthesis can not be pushed into the duodenum, a transhepatic removal is possible. © 1999 Harcourt Publishers Ltd

INTRODUCTION

Endoscopically inserted plastic stents for the palliative treatment of malignant obstructive jaundice is common practise.[1] The main reasons for placement are short survival expectance and low cost.[2]

However, in some cases due to the patient's longer survival and tumor overgrowth, the plastic stents may occlude and complications such as jaundice and cholangitis may occur.[3,4] The treatment most commonly used is the endoscopic replacement of the plastic stent. If the patient refuses the repetition of the endoscopy, or when endoscopical replacement is technically impossible due to anatomic reasons, the patient is transferred to a radiological department for percutaneous transhepatic decompression of the cholestasis. After the internal or external transhepatic drainage of bile, replacement of the endoprosthesis is necessary. In such a situation, endoscopy can be avoided by means of transhepatic removal of the plastic stent.

In this paper, we will describe the technique of transhepatic retrieval or transenteric removal of the occluded endoprosthesis, prior to placement of a metallic stent.

METHODS

During the last 2 years, six patients with an occluded plastic stent and subsequent obstructive jaundice and cholangitis were referred to our

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department for further treatment (three male, three female, all aged between 51 and 68 years). The plastic stents were endoscopically inserted 2–4 months before the new episode. In one case, the occluded stent was endoscopically replaced, but the new one was incorrectly positioned in the lower part of the obstruction (Fig. 2A). Two patients had Klatskin-cholangiocarcinoma of the liver hilum (Bismuth type II) and four had extrahepatic cholangiocarcinoma (two at the proximal and the rest at the distal common bile duct).

Two patients refused additional endoscopy and in one high-risk patient deep sedation was not recommended, due to a recent episode of angina pectoris. Endoscopy was not available in one patient due to technical problems, and in another one catheterization of the papilla of Vater was impossible because of a duodenal diverticulum (the initial stent was placed with help of a 'Rendevous'-technique). In the last patient the new stent was incorrectly inserted. Initially, a transhepatic approach for decompression was chosen.

In all cases a transhepatic internal drainage catheter was placed through the right liver lobe. The catheter was inserted parallel to the occluded endoprosthesis to the duodenum. In the case of the misplaced stent, two catheters were transhepatically advanced, one through the sixth and one through the eighth liver segment. Three days after the initial procedure bilirubin level was decreased and cholangitis signs disappeared. All patients were in a relatively good condition, with no evidence of metastatic disease. Therefore, replacement of the plastic endoprostheses with metallic ones was chosen.

All patients were placed under sedation after i.v. injection of 1–5 mg Midazolam, and were monitored continuously. The patient who was not suitable for deep sedation received an i.m. injection of 0.05–0.1 mg of hydrochloric pethidine. In all cases i.v. administration of antibiotics was ordered.

In five cases of occluded stents, a transhepatic route was preferred for their removal. Initially, the 10 Fr internal drainage catheter (Fig. 1A) was exchanged with a 11 Fr peel-away sheath. A safety guidewire was placed outside the sheath (Fig. 1B). A Nitinol Goose Neck Snare (NGNS) with a loop diameter of 15 mm was inserted through the sheath and in all cases snared the plastic stent around its distal end (Fig. 1C). Subsequently, the snare was moved up to the level of biliary bifurcation by pulling the NGNS and the stent against the tip of the sheath. The whole system, with exception of the safety guidewire, was then removed through the hepatic parenchyma (Fig. 1D). Finally, a 10 mm diameter and 6 cm length, metallic stent was inserted over the safety wire.

In the patient with the Klatskin tumor and the incorrectly replaced stent, the plastic endoprosthesis was incorrectly positioned in the distal part of the obstruction with its greatest part curved into the duodenum. Unfortunatly, no free end of the prosthesis was available to be snared by a NGNS (Fig. 2A). Three days after the double transhepatic internal drain, we decided to use small flexible biopsy forceps which was inserted through the upper peel-away sheath, all the way down to the duodenum. The forceps caught the middle portion of the stent and removed it up to the level of Treitz (Fig. 2B). Three days later, two metallic stents were inserted, while the previous endoprosthesis was still moving through the small bowel (Fig. 2C).

RESULTS

In all cases the procedure was completed without any technical problems. The patients felt only moderate pain with no bleeding, pyrexia, sepsis or any other complication. The procedure was described by the patients as tolerable and equal or even more acceptable than the endoscopy. Procedure time did not exceed one hour, and in all cases radiation time was less than 8 min. Bilirubin level decreased rapidly in all cases.

The patients received antibiotics for 5 days, while the draining catheter was removed in the third or fourth day after metallic stent placement. One patient died 3 months later with patent stent. One patient returned with an occluded stent 5 months later and a new metallic endoprosthesis was inserted, which stayed open for another 4 months until the patient died. The other three patients survived 8, 10 and 15 months after stent placement, without any jaundice or cholangitis episode.

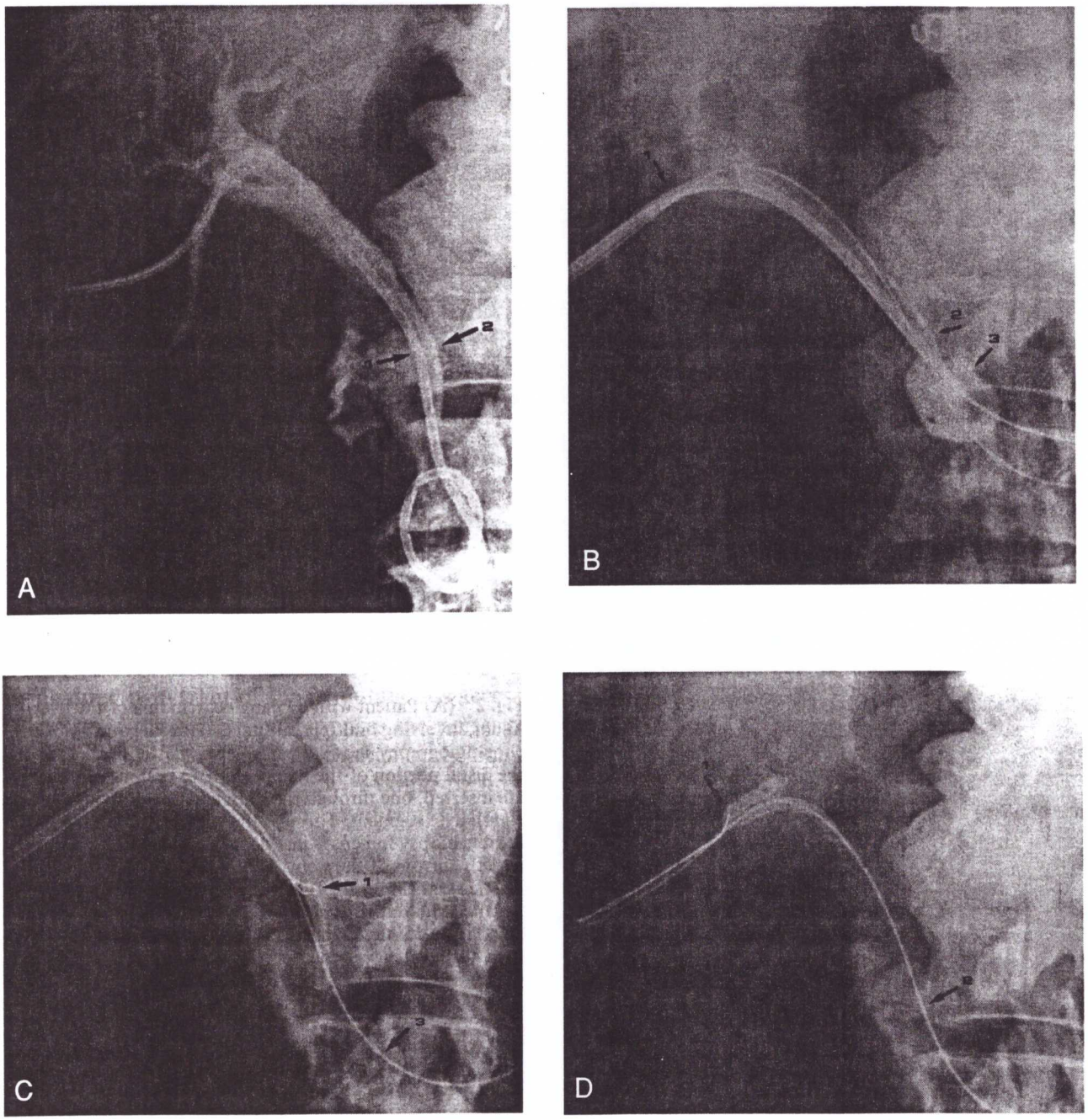
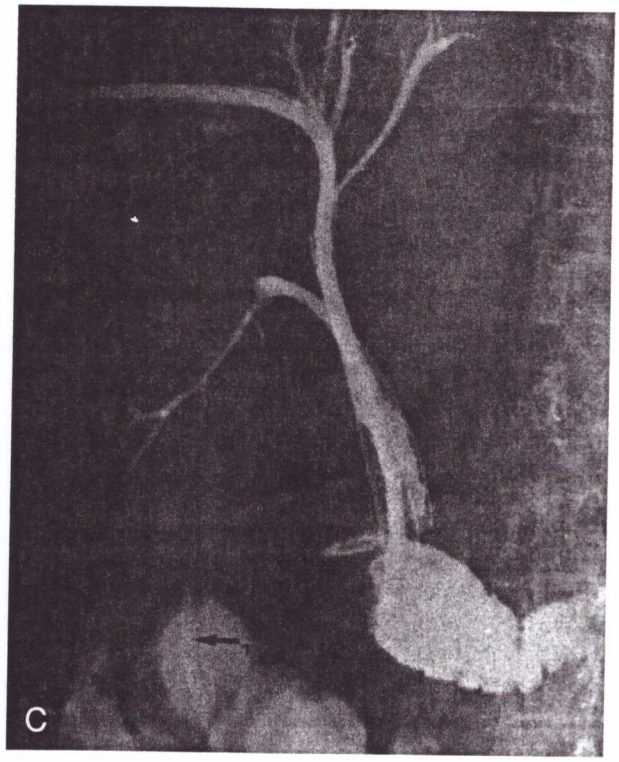


Fig. 1 (A) Patient with cholangiocarcinoma of the distal common bile duct. Transcatheteral cholangiography after the placement of a biliary drainage (1) parallel to the occluded plastic stent (2). (B) Distal cholangiography through the sheath (1). The tip of the occluded plastic stent (2) is in the duodenal diverticulum (3) in which the common bile duct ends. (C) Through the peel-away sheath the catheter of the NGNS is initialy inserted over a wire and after removal of the wire, the snare is advanced to the region of interest. The NGNS has snared the plastic stent (1) which is pulled against the tip of the sheath (2). Safety guidewire (3). (D) The plastic stent (1) is pulled out through the liver parenchyma simultaneously with the NGNS and the peel-away sheath. Only the safety guidewire (2) remains in place.

DISCUSSION

Endoscopically inserted plastic stents for the palliative treatment of malignant obstructive jaundice, are the most common iatrogenic inserted foreign bodies in the human biliary system.[5] Main reasons for their placement are short vival expectancy (3–5 months) and low cost. In patients with cholangiocarcinoma there may be a slower tumor growth and metastatic disease is noticed less often, as in cases of pancreatic head cancer, so that prolonged survival can be



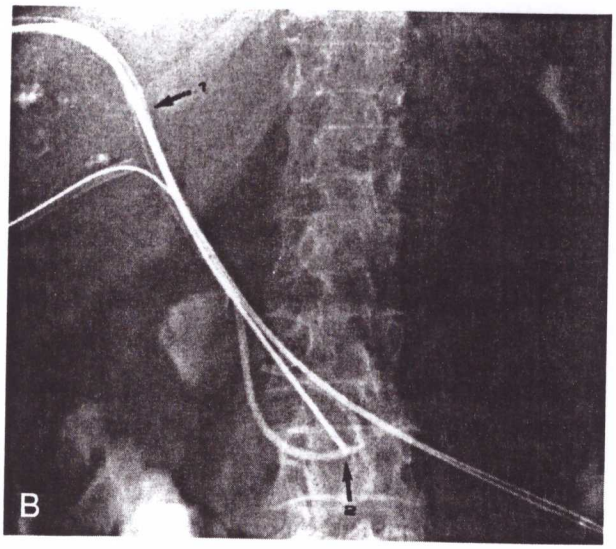


Fig. 2 (A) Patient with cholangiocarcinoma of the liver hilum, involving multiple bile ducts. Transhepatic cholangiography shows the misplaced plastic stent (1) in the distal portion of the lesion. (B) Two peel-away sheaths are inserted, one through the sixth and one through the eighth liver segment. Through the eighth segment, a flexible biopsy forceps is inserted (1) and manipulated directly infront of the stent. The middle portion of the plastic stent (2) is caught by the forceps and the stent is advanced up to the level of Treitz ligament. (C) Two metallic stents are inserted through the sheaths. Three days later, their patency is checked. The removed stent has progressed to the right colon flexure (1).

achieved. The mean patency time for plastic stents is 3–8 months, depending on the diameter and the type of the inserted stent.[6] With the use of the Tannenbaum stent, prolonged mean patency of 15 months is reported.[7] In some cases, patient's survival is prolonged and plastic stents occlude, so that jaundice and cholangitis occur.[6] In other cases, endoscopical management can be very difficult, especially in patients with Klatskin tumor obstructions. If the patient refuses further endoscopical treatment or stent replacement is technically impossible, an alternative treatment is percutaneous transhepatic decompression of the cholestasis. After the initial internal or external transhepatic drainage of bile, patients with short life expectancy can be left with the new draining catheter. If they are still in good condition and no metastatic disease is present, removal of the endoprosthesis is justified. In such a situation, endoscopy can be avoided by means of transhepatic removal of the plastic stent. The method of inserting a plastic endoprosthesis was described by Kerlan et al.[8] In this non-endoscopic-'rendevous' technique, a combined peroral-transhepatic

method is used in order to insert a plastic biliary stent. This method could be also used for removal and replacement of an endoprosthesis, but it is our opinion that it could demand more radiation time for duodenal catheterization, as well as more patient discomfort.

Percutaneous removal of foreign bodies through the vascular and biliary system is well described in the literature.[9–15] Jackson et al. described the transhepatic replacement of occluded plastic stents with new plastic ones, after transenteric or transhepatic removal.[9] Lee et al. reported similar experience.[10] At that time NGNS was not available. Most of these cases are carried out with the help of the NGNS which is available in five different loop sizes and, in most cases, is the retrieval instrument of choice. It is easy to manipulate, has high radiopacity, great tensile strength and a small diameter of its guiding catheter (4–6 Fr). Other types of retrieval instruments, such as flexible forceps, can be manipulated into different biliary ducts, and could be used in cases where the foreign body is lying directly in front of the percutaneous access. The use of the NGNS presupposes the presence of at least one free end of the foreign body, but if both are covered, a deflector wire could be used to release one end, so that removal could be performed.[13]

We have used the flexible forceps only in the last case, where the use of NGNS was not possible, but we believe that the removal by forceps should be tried every time prior to the snare, because of cost reasons. The flexible forceps can be sterilized and used again without any new expenses. Even if the NGNS is necessary, a transenteric removal of the stent after it is snared, is possible. Nevertheless, sometimes the plastic stents hang on the wall of a loop and are a potential risk for ileus or penetration.[12]

After the initial drainage, it is necessary to wait a few weeks for the biliocutaneous tract to heal before carrying out transhepatic plastic stent extractions. Nevertheless, we performed all removal procedures 3–7 days after the initial drainage and no bleeding, haemobilia, sepsis or other complication occured. During and after the procedures, we encountered no technical problems or complications related to the transhepatic or transenteric passage of the stents. There was moderate but tolerable pain and no evidence of hemorrhage or organ damage.

In conclusion, the percutaneous transenteric removal of endoscopically inserted plastic stents can be easily performed in special cases prior to the insertion of metallic stents. If the transenteric removal is not possible, a transhepatic one can be performed.

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