

:(Hanaro stent, Solco Intermed, Seoul, Korea)
: 2000 1 2001 5
46 5
(2), (2), (1)
(PTBD) , 4
1
8 - 10 mm, 50 - 100 mm
, 가
:
5 olive tip (3), (2),
가 (1) Olive
tip 3 2 olive tip 1
2 1 가
, 1 가
가
PTBD
:
, 가 가
olive tip

가 가 (1, 2).
(PTBD) (7 - 9, 11). ,
,

(3, 4, 5).
(Introducing system)
가 가
(5 - 10).
(Hanaro stent, Solco Intermed, Seoul, Korea)

2000 1 2001 5

46

2 45 61 (, 55)
 (2), (2),
 (1)
 (2), (2), 46 5 가 (Table 1).
 (1) 5 olive tip (3),
 가 (2), (1) 5
 , 가 , 4
 (Fig. 1) 0.006 - inch
 zigzag 10 (bend 1 PTBD
 - 5 mm).
 olive tip
 olive tip
 가 (Fig. 2). Olive tip
 가
 8 - 10 mm, 50 - 100
 mm 가 , 가
 4 PTBD olive tip olive tip
 , 1 2 8 mm olive tip 2 가
 4 olive tip 2
 ,
 PTBD
 olive tip 가
 , olive tip
 가 olive tip

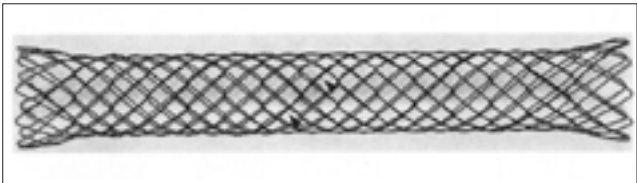


Fig. 1. Photograph of the self-expandable Hanaro spiral stent that is made from a strand of nitinol wire. This buttressing strut (arrow heads) obliquely overlaps the wire bends.

Table 1. Summaries of the Patients Who had Difficulties in Withdrawal of an Introducing System after Hanaro Stent Deployment

Age/Sex	Disease	Obstruction level	Stent	Problem	Comment
57/F	Pancreatic cancer	CBD	Hanaro	Olive tip breakage	Release of olive tip into duodenum
45/M	Pancreatic cancer	CHD, CBD	Hanaro (n = 2)	Upward displacement of additional stent	Improper placement of first stent
				Olive tip breakage	Release of olive tip into duodenum
61/F	Cholangiocarcinoma	Primary biliary confluence with left main duct	Hanaro (n = 2)	Olive tip breakage	Failure of removing the drainage catheter
					Pushing of olive tip into peripheral IHD
59/M	Cholangiocarcinoma	CHD, CBD	Hanaro	Upward displacement of stent	Insertion of additional stent
56/M	Gastric cancer	CHD, CBD	Wallstent Hanaro	Improper expansion at nonstenotic site	Balloon dilatation

Note: CBD = Common bile duct; CHD = Common hepatic duct

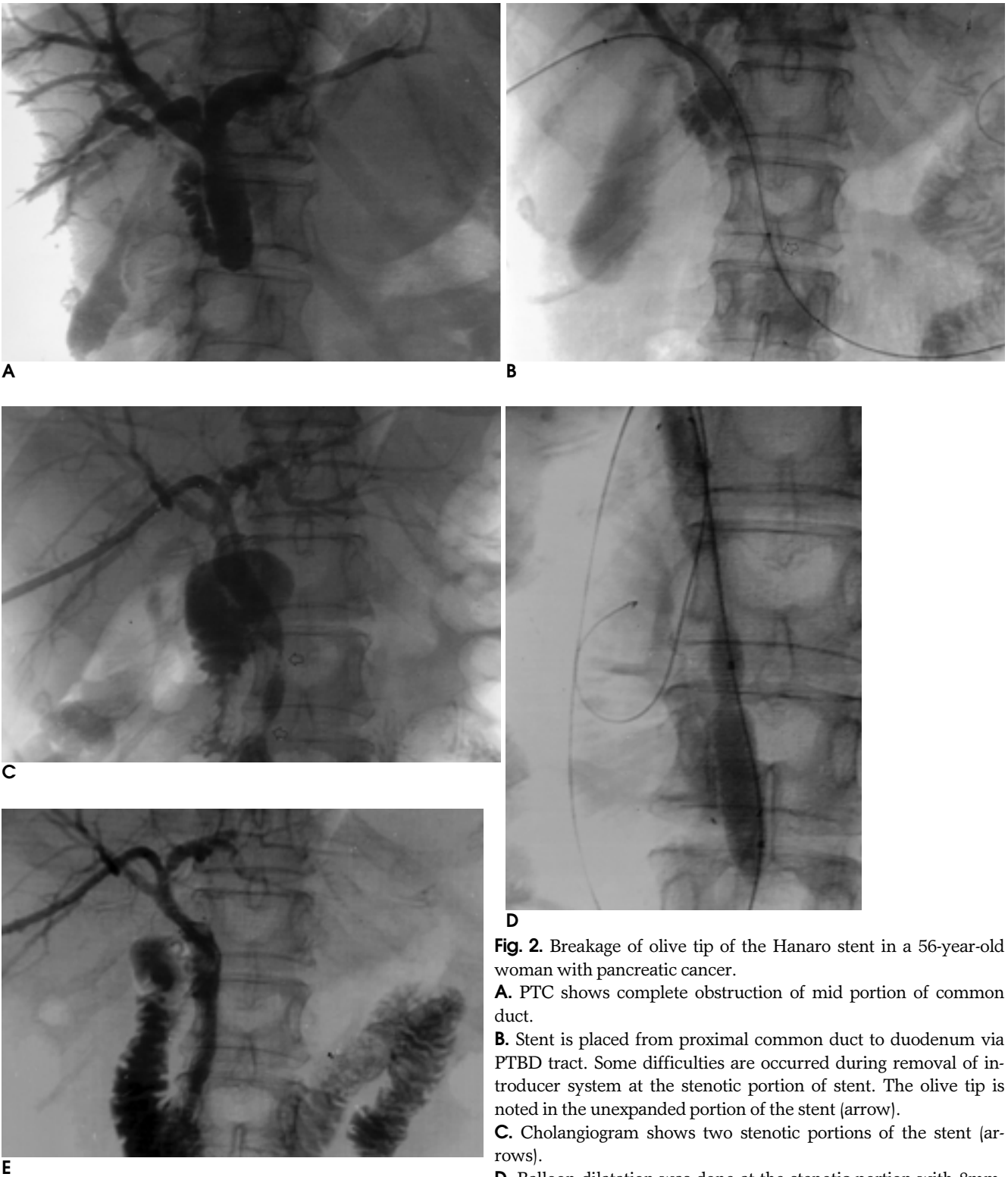


Fig. 2. Breakage of olive tip of the Hanaro stent in a 56-year-old woman with pancreatic cancer.

A. PTC shows complete obstruction of mid portion of common duct.

B. Stent is placed from proximal common duct to duodenum via PTBD tract. Some difficulties are occurred during removal of introducer system at the stenotic portion of stent. The olive tip is noted in the unexpanded portion of the stent (arrow).

C. Cholangiogram shows two stenotic portions of the stent (arrows).

D. Balloon dilatation was done at the stenotic portion with 8mm, 4cm balloon catheter.

E. Two days later, the stent is well expanded and the contrast media drains well into the duodenum. Also olive tip has passed through the duodenum.

가, PTBD, olive tip, PTBD, olive tip, 1, 14, 2, olive tip, 가, olive tip, 가

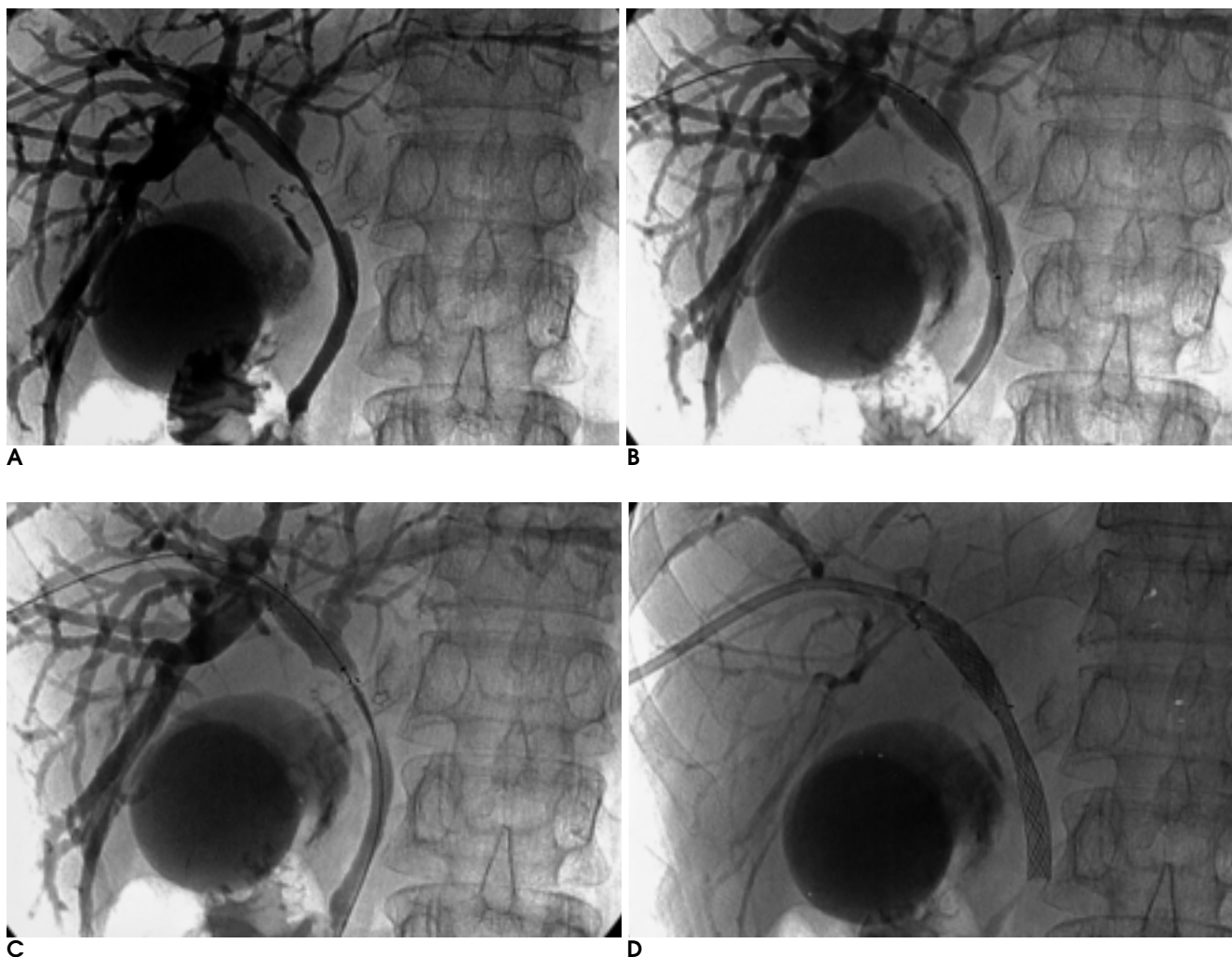


Fig. 3. Stent migration during withdrawal of the introducing system of the Hanaro stent in a 59-year-old man with cholangiocarcinoma at extrahepatic bile duct.
A. PTC shows segmental occlusion of proximal and mid portion of common duct (arrows).
B. Stent is placed from right main duct to common bile duct via PTBD tract. Stent is not sufficiently expanded at stenotic portion of common duct.
C. Stent is upwardly displaced to right main bile duct during removal of introducing system and the olive tip of the introducing system (arrow) is in stent portion.
D. An additional stent is inserted from common hepatic duct to common bile duct.

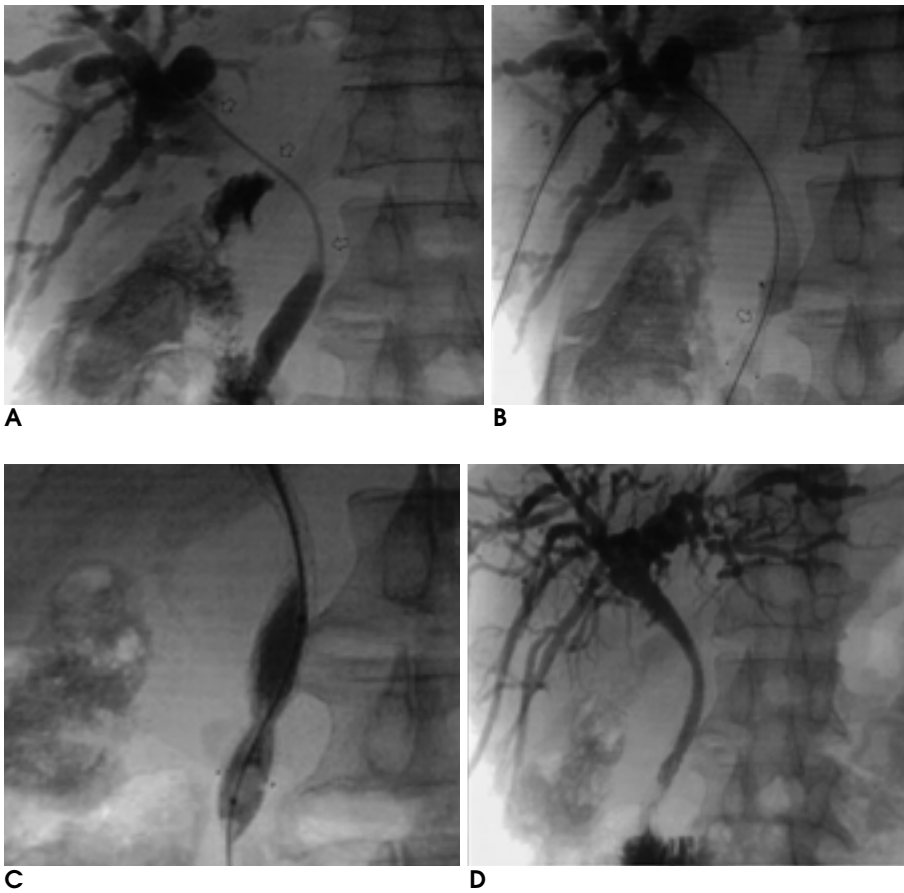


Fig. 4. Improper expansion of the distal portion of the stent unrelated with obstruction site in a 56-year-old man with gastric carcinoma.

A. PTC shows segmental occlusion of common hepatic duct and proximal portion of common bile duct (arrows).

B. Stent is placed from right main duct to common bile duct via PTBD tract. Stent was not sufficiently expanded at the distal portion unrelated with obstruction site (arrow).

C. Balloon dilatation was done at the unexpanded portion of the stent with 8mm, 4cm balloon catheter.

D. After balloon dilatation, the stent is well expanded and the contrast media drains well into the duodenum.

olive tip
가 가 가
가 olive tip
(Fig. 3). (6).
(Fig. 4). (5).
가 가 가
(11).
가 가 가 (11,
13). (13)
가 가 (hoop strength)
가 가
Lee (11)
(6 mm bend)가 1)
(12). 가 , 2) 가
가 가

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Stent Insertion in Patients with Malignant Biliary Obstruction: Problems of the Hanaro Stent¹

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Purpose: To investigate the problems of the Hanaro stent (Solco Intermed, Seoul, Korea) when used in the palliative treatment of patients with inoperable malignant biliary obstruction.

Materials and Methods: Between January 2000 and May 2001, the treatment of 46 patients with malignant biliary obstruction involved percutaneous placement of the Hanaro stent. Five patients encountered problems during removal of the stent's introduction system. The causes of obstruction were pancreatic carcinoma ($n=2$), cholangiocarcinoma ($n=2$), and gastric carcinoma with biliary invasion ($n=1$). In one patient, percutaneous transhepatic cholangiography and stent insertion were performed as a one-step procedure, while the others underwent conventional percutaneous transhepatic biliary drainage for at least two days prior to stent insertion. A self-expandable Hanaro stent, 8 - 10 mm in diameter and 50 - 100 mm in length, and made from a strand of nitinol wire, was used in all cases.

Results: Among the five patients who encountered problems, breakage of the olive tip occurred in three, upward displacement of the stent in two, and improper expansion of the distal portion of the stent, unrelated with the obstruction site, in one. The broken olive tip was pushed to the duodenum in two cases and to the peripheral intrahepatic duct in one. Where the stent migrated during withdrawal of its introduction system, an additional stent was inserted. In one case, the migrated stent was positioned near the liver capsule and the drainage catheter could not be removed.

Conclusion: Although the number of patients in this study was limited, some difficulties were encountered in withdrawing the stent's introduction system. To prevent the occurrence of this unusual complication, the stent should be appropriately expansile, and shape in the olive tip should be considered.

Index words : Bile duct, interventional procedure

Bile duct, stents and prostheses

Bile duct, obstruction

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