

:

가 12  
4 , 4 , 2 , 1 , 1  
I 가 1 , II 가 8 , III 가 3 . II  
8 6 mm  
after - loading 16 mm  
: 10  
2 III , 1 transgastric approach  
(migration)가  
1 4  
3 (n=1), (n=1) 2 (n=1),  
II  
8 1 11  
14 ( , 9 )

:

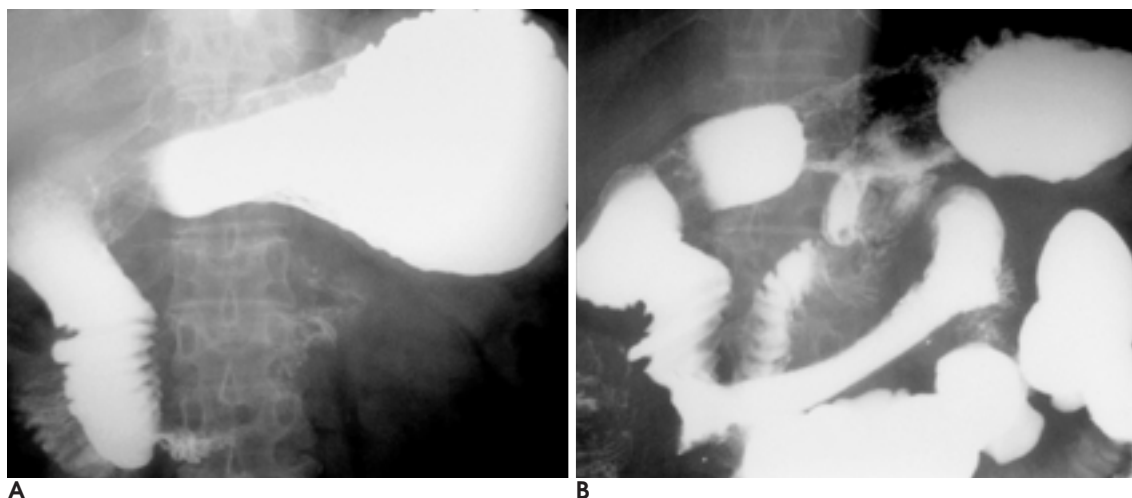
ingrowth) (granulation tissue formation)  
가 (5, 7 -  
10).  
(polyurethane covered stent) 가  
(1, (11, 12).  
(antrum)  
가 II  
(intro -  
ducer sheath)  
10). 가  
(uncovered stent) (tumor  
(gastric outlet)

<sup>1</sup>

<sup>2</sup>

1998 9 2000 3 12 0.035 - inch 38 - 81 61 6 4 가 2 가 1 (Table 1). (forceps biopsy) 가 1 - 2 II 가 8 가 III 가 1 3 II 8 (n=6), (n=1), (n=1) (11) 0.2 mm 16 (Chronoflex; Carditech International, Woburn, Mass, U.S.A.) 40 - 100 mm, 16 mm 1 cm 26 mm 20 mm (intro - ( ) , ( )

ducer set) 6 mm, 5 mm Teflon (pusher catheter), 6 mm, 4 cm guiding balloon catheter(Ultra - thin Diamond; Boston Scientific, Natick, Mass, U.S.A.) (11) after - loading 0.035 - inch guid - ing balloon catheter가 balloon catheter 가 1 - 2 가 (Lunderquist Extra Stiff Wire Guide; Cook - Europe, Bjaeverskov, Denmark) 가 가 가



**Fig. 1.** Patient 4. 49-year-old woman with retroperitoneal lymph node metastases from uterine cervical carcinoma.  
**A.** Upper gastrointestinal study obtained before the procedure shows a dilated stomach and proximal duodenum due to near total obstruction of the third portion of the duodenum.  
**B.** Upper gastrointestinal study obtained 1 day after the procedure shows good barium passage through the stent.

, ( ) 5 (patient 2) 3  
 , .  
 (patient 8) 2  
 ( 30 mm, 12 cm)  
 12 III 2  
 10 (83%) 가 (patient 4) 5  
 (Fig. 1). 2 1 (patient  
 11)  
 transgastric approach  
 1 (patient 12) 11 2 46  
 가 가 . 14 ( , 9 )  
 11 II 1 1 , 1 ,  
 (patient 2) 4 가 가 9 .  
 10  
 ( 18 mm)  
 11  
 , 가  
 2 (patient 4, 7)  
 가 .  
 100%  
 (Table 1). II 가 가 80 - 95% (13).  
 8 1 (patient 2)  
 4 . 가 (bypass surgery)  
 . 9 50% (2). 가  
 . 가  
 ampulla of 가 (nasojejunal feed-  
 Vater , ing tube; percutaneous gastrojejunostomy)  
 (Fig. , 가  
 2). 가

**Table 1.** Results of Covered Expandable Nitinol Stent Placements in 12 Patients with Malignant Duodenal Obstruction

Patient No	Age/ Sex	Site of Obstruction	Cause of Obstruction	Covered Stent		Food Intake Capacity		Complications	Biliary Decompression	Outcome & Duration (week)
				Number	D/L(mm)	Before	After			
1	58/M	Part	Pancreatic carcinoma	1	16/80	Liquid	Soft	-	Choledochojejunostomy	Dead, 4
2	56/F	Part	Distal CBD carcinoma	2	16/60	Liquid	Soft	J/M/RS	Biliary stent	Dead, 30
3	38/M	Part	Pancreatic carcinoma	1	16/80	None	Soft	-	ERBD, PTBD	Dead, 8
4	49/F	Part	Cervical carcinoma	1	16/80	None	Liquid	RS	-	Dead, 11
5	53/F	Part	Pancreatic carcinoma	1	16/100	Water	Soft	-	PTBD	Dead, 20
6	57/F	Part	GB carcinoma	1	16/60	None	Liquid	-	PTBD	Dead, 2
7	66/M	Part	Pancreatic carcinoma	1	16/100	None	Liquid	-	PTBD	Dead, 9
8	55/M	Part	GB carcinoma	1	16/40	Liquid	Soft	RS	-	Dead, 7
9	76/F	Part	Duodenal carcinoma	1	16/50	None	Soft	-	PTBD	Dead, 6
10	69/F	Part	Duodenal carcinoma	1	16/70	Water	Solid	-	PTBD	Dead, 11
11*	81/M	Part	Duodenal carcinoma	1	16/70	Water	Soft	-	-	Dead, 46
12	72/M	Part	Duodenal carcinoma	NA	NA	None	NA	NA	-	NA

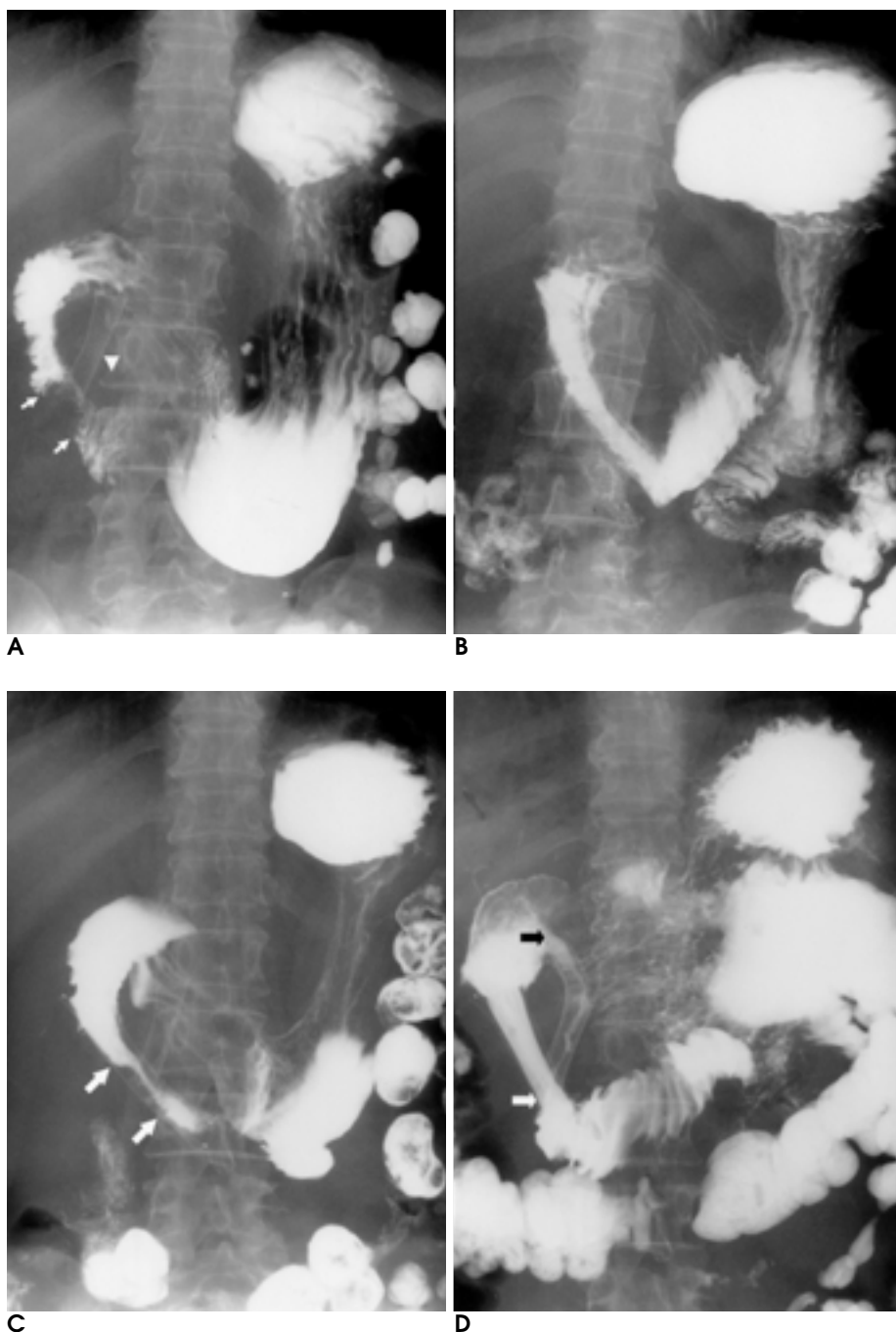
Note.- J=jaundice, M=migration, RS=recurrent symptom, D=diameter, L=length, CBD=Common bile duct, GB=Gall bladder, ERBD=Endoscopic retrograde biliary drainage, PTBD=Percutaneous transhepatic biliary drainage, NA=non-applicable

\* Transgastric approach

가 , 가 . transgastric approach , (3, 6, 7, 14, 15). 6 mm after - loading 가 pre - loading (longitudinal flexibility) 가 (3)

II , , 가 (loop formation) 가 (4, 9).

III 1



**Fig. 2.** Patient 2. 56-year-old woman with distal common bile duct carcinoma invading the duodenum.

**A.** Upper gastrointestinal study obtained before placement of the stent shows a stricture(arrows) in the second portion of the duodenum. Note the metallic biliary stent(arrowhead) placed earlier to treat jaundice.

**B.** Upper gastrointestinal study obtained 1 day after covered stent placement shows good relief of obstruction. The stent migrated 4 day after stent placement.

**C.** Upper gastrointestinal study obtained 64 days after placement of the second, uncovered stent reveals recurrent stent stenosis(arrows) because of tumor ingrowth.

**D.** Upper gastrointestinal study obtained 1 day after placement of the third, covered stent shows good barium flow. Second biliary stent(arrows) is also placed in the extrahepatic duct extending into the duodenum.

loading , after - , 가

가 (17, 18) 7 가

가 가 가 가 가

가 (16).

가 1 가

가 2 3 가 (6).

가 가

II , ampulla of Vater

II 8 1 가

2 ampulla of Vater

II

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J Korean Radiol Soc 2002;46:329 - 334

## Malignant Duodenal Obstructions: Palliative Treatment with Covered Expandable Nitinol Stent<sup>1</sup>

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**Purpose:** To evaluate the feasibility and clinical effectiveness of using a polyurethane-covered expandable nitinol stent in the palliative treatment of malignant duodenal obstruction.

**Materials and Methods:** Under fluoroscopic guidance, a polyurethane-covered expandable nitinol stent was placed in 12 consecutive patients with malignant duodenal obstructions. All presented with severe nausea and recurrent vomiting. The underlying causes of obstruction were duodenal carcinoma ( $n=4$ ), pancreatic carcinoma ( $n=4$ ), gall bladder carcinoma ( $n=2$ ), distal CBD carcinoma ( $n=1$ ), and uterine cervical carcinoma ( $n=1$ ). The sites of obstruction were part I ( $n=1$ ), part II ( $n=8$ ), and part III ( $n=3$ ). Due to pre-existing jaundice, eight patients with part II obstructions underwent biliary decompression prior to stent placement. An introducer sheath with a 6-mm outer diameter and stents 16 mm in diameter were employed, and to place the stent, an after-loading technique was used.

**Results:** Stent placement was technically successful in ten patients, and no procedural complications occurred. In one of two patients in whom there was technical failure, and in whom the obstructions were located in part III, the stent was placed transgastrically. Stent migration occurred in one patient four days after the procedure, and treatment involved the placement of a second, uncovered, nitinol stent. After stent placement, symptoms improved in all patients. During follow-up, obstructive symptoms [due to stent stenosis ( $n=1$ ), colonic obstruction ( $n=1$ ), and multiple small bowel obstructions ( $n=1$ )] recurred in three patients. Two of these were treated by placing additional stents in the duodenum and colon, respectively. One of the eight patients in whom a stent was placed in the second portion of the duodenum developed jaundice. The patients died at mean 14 (median, 9) weeks after stent placement.

**Conclusion:** The placement of a polyurethane-covered expandable nitinol stent seems to be technically feasible, safe and effective for the palliative treatment of malignant duodenal obstructions.

**Index words :** Duodenum, stenosis or obstruction  
Gastrointestinal tract, interventional procedure  
Stents and prostheses

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