

Sutureless Gastroduodenostomy after Radical Subtotal Gastrectomy

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Purpose: A gastroduodenostomy (Billroth I) is the most physiologic reconstructive method available today, it has recently been used more frequently subsequent to radical subtotal gastrectomies for the treatment of gastric cancers. However, it is inevitable that gastroduodenostomies involving sutures or staples may have complications such as ulcers, bleeding, or constriction caused by remaining foreign materials. We analyzed the results of sutureless gastroduodenostomies using biofragmentable anastomosis rings (BAR) with regard to safety, usefulness and profits.

Methods: Sutureless gastroduodenostomies using BAR (Valtrac, Davis & Geck Wayne, NJ) composed of polyglycolic acid and Barium for x-ray visualization, performed after radical subtotal gastrectomies in 17 gastric cancer patients in the period from 1999 to 2001.

Results: Five patients had early cancers and 12 had advanced cancers. The mean size of the tumor masses was 5.0×3.7 cm, and the mean lengths of the proximal and distal resection margins from the tumors were 7.6 cm and 3.0 cm respectively. The lengths of lesser curvature and greater curvature of the resection specimens were 10.6 cm and 20.5 cm respectively. Fourteen tumors were located in the antrum and the other 3 were located in the body. The mean operating time was 164.4±35.2 min., and the mean hospital stay was 14.1±3.1 days. Sips of water could be started 4.4±0.5 days after the operation. In all patients, the sutureless gastroduodenostomy site appeared watertight and maintained its initial burst strength, which was verified using gastrografin x-ray visualization performed 1 week after the operation. There were no anastomosis related complications in any of the patients; except for two mild satiety, which

were treated quickly by the patients themselves. The BAR began to fragment 3 weeks after the operation, and disappeared completely within 4 weeks. The diameters of the anastomosis sites were large enough to pass foods without constriction and no other secondary changes developed in the Barium x-ray visualization or endoscopic examination, which was performed 1 month after the operation.

Conclusion: A sutureless gastroduodenostomy using BAR is a safe, easy, and efficient reconstructive method to be used subsequent to a radical subtotal gastrectomy for gastric cancers. (*J Korean Surg Soc* 2002;63:46-50)

Key Words: Gastric cancers, Gastroduodenostomy, Biofragmentable anastomosis ring

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(Billroth I) 1881 Theodor Billroth(I)
 가
 (Billroth II)
 가
 (staples)
 x-ray Barium sulfate
 polyglycolic acid

, D2
 Maxon (polyglyconate monofilament absorbable sutures) purse-string suture
 BAR (25-34 mm outer diameter, 1.5-2.5 mm gap)
 BAR
 “ ” 가
 (Fig. 1). 1 Gastrografin (UGI)
 BAR , 4 Barium UGI

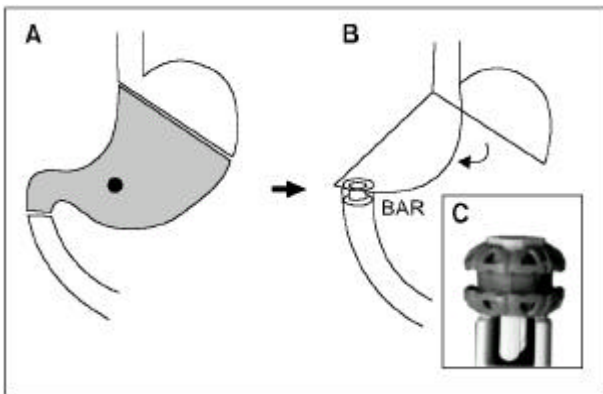


Fig. 1. Operative procedure of sutureless gastroduodenostomy. A. Gastric resection was done whilst leaving sufficient distance from the proximal and distal tumor margins. B. Note that the gastroduodenostomy was completed after subtotal gastrectomy with BAR. C. The real thing of BAR (Valtrac, Davis & Geck Wayne, NJ).

Table 1. Clinical findings

Findings	Number
Mean age (range)	68.2 (43-83)
Sex (M : F)	12 : 5
Stage	
I	6
II	4
III	5
IV	2

17 가 12 , 가 5 ,
 68 (43-83) . 5 , 12
 UICC stage IA가 4 , IB가 2 , II가 4 , IIIA
 가 3 , IIIB가 2 , IV가 2 (Table 1).
 14 , 3 , 12 가
 (Table 2), 5.1×3.7 cm .
 10.6 cm 20.5 cm ,
 가 7.6 cm 가 3
 cm 가가 (Table 3).
 25 (19-45) ,
 8 , intestinal type 8 가 (Table 4).

Table 2. Location of tumors

Location	Number
Antrum	14
Body	3
Lesser curvature	12
Greater curvature	4
Anterior wall	1

Table 3. Gross findings of resection specimens

Findings	Mean length (cm)
Tumor size: Long	5.1 (1.5-10)
Short	3.7 (1-9)
Length of lesser curvature	10.6 (7.5-14)
Greater curvature	20.5 (15-28)
Resection margin: Proximal	7.6 (3-13)
Distal	3.0 (1-7)

Table 4. Pathologic findings

Findings	Number
Differentiation: Well	8
Moderate	3
Poorly	5
Signet ring cell	1
Lauren Classification: Intestinal	8
Mixed	4
Diffuse	5



Fig. 2. The finding of gastrografin UGI checked at 7 postoperative days. No leakage or passage disturbance was evident.



Fig. 3. The finding of simple abdominal x-ray checked at 3 postoperative weeks. Note that the biofragmented anastomosis ring (BAR) is cracked and evacuated.

Table 5. Operating time and hospital course

Findings (mean)	Duration (range)
Operation (min)	164.4 (120 240)
Sips of water (day)	4.4 (4 6)
Admission (day)	14.1 (11 21)

164.4 ± 35.2 (120 240),
 3 (6 pints), 14.1 ± 3.1
 (11 21) . 4 5 sips of water
 (Table 5), 1 Gastrografin
 UGI (Fig. 2)
 가 . 3 (Fig. 3) BAR
 , 4 Barium UGI (Fig. 4)
 가
 . 1 3 (Fig. 5)
 3
 , 2



Fig. 4. Barium UGI finding checked at one postoperative month. No stenosis or passage disturbance was evident.

(Billroth I)

(Billroth II)

dumping

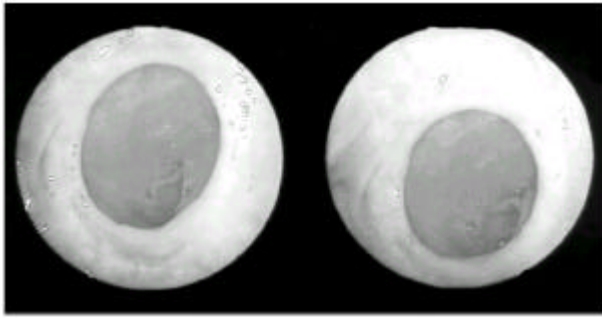


Fig. 5. Endoscopic finding checked at 3 postoperative months. Note that stenosis and other secondary changes caused by remnant foreign bodies were not found.

syndrome afferent loop syndrome, marginal ulcer

가 (2)
가 (3)
(4) (5) (6)
(7)

BAR (8) 1999

BAR polyglycolic acid 87.5% x-ray
Barium sulfate 12.5%
가 가

1985 Hardy(9)가 BAR

(10) Cahill,(11) Corman (12)

가 가 가 가
Dietz (13) 1999 24

가 (early satiety) 2

5 (initial burst strength) BAR가 가

7 gastrografin UGI
가 .4 Bar-
ium UGI 가 . Penka (14)
3
가

BAR
purse-string suture

gap BAR
(15)
BAR

Reiling (16)

가 가
164.4
(4-6)

± 35.2 (120 240)
10
가 (17-19)
Grise McFadden(20)

5
(3)

3

12 4 가
1 가 , 3

10.6 cm,
20.5 cm
7.6 cm, 3 cm

(4-6)
가가

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