

Gastric Mucosal Lesions in Cases of Nonshunting Procedures for Esophageal Varices

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ABSTRACT

Gastric mucosal lesions in 74 patients with esophageal varices for whom the nonshunting procedure was given in our institute from 1973 to 1983 were studied. Out of 9 patients of operative death, the direct cause of death in 2 patients was acute gastric mucosal lesion (AGML), and both patients belonged to Child C according to Child's Classification. The rate of complication of gastric mucosal lesion before operation was 42%, while it was 64% after operation, and all cases were complicated with liver cirrhosis. Among 31 cases in whom the condition before and after operation in the same case was compared, and found that gastric mucosal lesions were aggravated after operation in 12 patients (39%). The rate of post-operative aggravation of gastric mucosal lesions classified by the surgical formula was 18.8% of esophageal transection, and in comparison Hassab's operation was as high as 61.1%. In patients with liver cirrhosis, the defensive factors of the gastric mucosa had been reduced. Hassab's operation which changes the gastric mucosal blood flow by periesophago-gastric devascularization has a high possibility of aggravating gastric mucosal lesions.

In patients with liver cirrhosis, the frequency of complication of erosive gastritis or gastric ulcer with gastric mucosal lesion is high, and bleeding from the lesion constitutes the source of the bleeding from the upper digestive tract, together with the rupture of esophageal varices, leading to poor prognosis^{8,9)}.

In the present study, the authors compared and examined gastric mucosal lesions before and after operation, mainly with gastric endoscopic findings with a purpose of studying the influence of the nonshunting procedures for esophageal varices on gastric mucosal lesions.

MATERIALS AND METHOD

Seventy four patients with esophageal varices for the nonshunting procedure performed in our institute from January 1973 to April 1983 were made the subjects. The basic diseases included 66 cases of liver cirrhosis and 8 cases of idi-

opathic portal hypertension (IPH). Surgical formulas included 30 cases of Sugiura's procedure¹¹⁾, 18 cases of esophageal transection (transthoracic), and 26 cases of Hassab's operation⁴⁾. The authors have been regarding Sugiura's procedure as the standard, and the two-stage divided operation of the thoracic procedure (esophageal transection) and the abdominal procedure (Hassab's operation) has been performed.

The judgement for gastric mucosal lesions was given by making the cases having one of ulcers, ulcerative scars, or erosions as positive cases. The time of judgement was made in principle at the time before operation and in 1 month after operation confirmed by gastroendoscopy. Judgement was given for patients of operative death by macroscopic findings of the gastric mucosa at autopsy.

RESULTS

1. Gastric Mucosal Lesions in cases of operative death

The number of cases of operative death was 9, and the rate was 12.2%. Autopsy was given onto eight cases excluding Case No.9, and in six

of them acute gastric mucosal lesions (AGML) were found. Evaluation of the functional reserve cell mass of the liver before operation in Patient No.6 and No.7 was Child C, and hemorrhage from AGML was the direct cause of death (Table 1).

Table 1. Operative death in nonshunting procedure for portal hypertension

Case	Age	Sex	Method of operation	Time of operation	Child classification	AGML	Cause of death
1.	52	M	Sugiura's procedure	Elective	B	+	Empyema
2.	50	F	Sugiura's procedure	Prophylactic	B	+	Bleeding of varices
3.	76	M	Esophageal transection	Elective	C	-	Empyema
4.	56	F	Esophageal transection	Emergency	C	+	Empyema
5.	59	F	Hassab's operation	Emergency	C	-	Perforation of stomach
6.	49	M	Hasasb's operation	Emergency	C	+	GIB
7.	56	F	Hassab's operation	Emergency	C	+	GIB
8.	51	F	Hassab's operation	Elective	B	+	Perforation of stomach
9.	53	M	Hassab's operation	Elective	B	?	Rebleeding of varices

AGML: Acute Gastric Mucosal Lesion

GIB: Gastrointestinal Bleeding

2. Gastric Endoscopic Findings before and after nonshunting procedure

Thirty six cases before operation and the same number after operation were observed the gas-

tric mucosa endoscopically. Among 36 cases before operation, gastric mucosal lesions were found in 15 (42%), and among the same number after operation, gastric mucosal lesions were found in 23 (64%) (Table 2).

Table 2. Endoscopic findings of esophageal varices before and after nonshunting procedure

	Before (36 cases)	After (36 cases)
Gastric Mucosal Lesion (+)	15 (42%)	23 (64%)
Ulcer	4	6
Ulcerative Scar	2	3
Erosion	9	14
Gastric Mucosal Lesion (-)	21 (58%)	13 (36%)

3. Comparison of Gastric Mucosal Lesions before and after nonshunting procedure

The number of cases on which observation was able to continue for the development of gastric mucosal lesions in the case before and after operation was 31. The severity of gastric mucosal lesions after operation in comparison with that before operation was evaluated by three stages of Improvement, No change and Aggravation. The incidence was 13% of Im-

provement, 48% of No change and 39% of Aggravation (Table 3).

Table 3. Changes of Gastric Mucosal Lesion before and after nonshunting procedure

After operation	No. of cases
Aggravation	12 (39%)
No change	15 (48%)
Improvement	4 (13%)

4. Comparison of Gastric Mucosal Lesions classified by the operative formula

The number of complications of gastric mucosal

lesions after esophageal transection and Hassab's operation was 10 out of 17 (59%), and 17 out of 28 (61%), respectively, and no difference was noted between both groups (Table 4).

Table 4. Gastric Mucosal Lesion after esophageal transection and Hassab's operation

		After esophageal transection (17 cases)	After Hassab's operation (28 cases)
Gastric Mucosal Lesion (+)	Ulcer	10 (59%)	17 (61%)
	Ulcerative Scar	1	4
	Erosion	3	0
		6	13
Gastric Mucosal Lesion (-)	7 (41%)	11 (39%)	

However, among 16 cases of esophageal transection and 18 cases of Hassab's operation in which comparison was possible before and after operation in the same case, the number of cases in which gastric mucosal lesions were aggravated after operation was 3 in the former group and 11 in the latter group. The rate of aggravation in esophageal transection was 19%, while it was 61% by Hassab's operation, and the difference was significantly higher in the later group ($p < 0.05$, Table 5).

Table 5. Changes of Gastric Mucosal Lesion before and after nonshunting procedure

After operation	Esophageal transection (17 cases)	Hassab's operation (28 cases)
Aggravation	3 (19%)	11 (61%)
No change	9 (56%)	4 (22%)
Improvement	4 (25%)	3 (17%)

significant difference: * $p < 0.05$

DISCUSSION

Judging from the report examining the source of upper gastrointestinal hemorrhage in patients with liver cirrhosis, the rate of bleeding from gastric mucosal lesions might constitute about 30%^{1,6)}. For patients with liver cirrhosis, not only esophageal varices, but also the complication with gastric mucosal lesions must be very careful to observe.

In the gastric mucosa in patients with liver cirrhosis, defensive factors against peptic ulcers

are reduced, including the reduction in gastric mucosubstance³⁾, disturbance of microcirculation⁷⁾, and acceleration of H⁺ back diffusion¹⁰⁾, so that complication of gastric mucosal lesions is easily occur. When stress due to operation and infection are added, gastric mucosal lesions are easily developed and aggravated. In our results, accordingly, the rate of complication of gastric mucosal lesions was higher after operation than before it. It is further considered that in cases of operative death, complication of serious gastrointestinal bleeding (GIB) might be high. Furthermore, the functional reserve cell mass of the liver in patients complicated with GIB was reduced to Child B or C, and in addition 2 patients whose direct cause of death was considered AGML were Child C respectively. It is presumed that in patients in whom the functional reserve cell mass of the liver was decreased, complication of serious gastric mucosal lesions might be triggered easily by the operation and such factors.

It is stated in a report studying the operative formula for esophageal varices complicated with liver cirrhosis, and gastric mucosal lesions that peptic ulcers occurred easily after the shunt operation. It is believed that in patients who received shunt operation, inactivation of secretagogues in the liver, such as histamine or gastrin, is reduced due to bypass formation to the liver, and as a result gastric acid secretion is accelerated, and peptic ulcers occur easily^{2,3,5)}. In nonshunting procedure aiming at the devascularization to esophageal varices, however, a possi-

bility of the reduction in inactivation of secretagogues, unlike shunt operation, is slim. When examined by the operative formula, the rate of complication of post-operative gastric mucosal lesions between esophageal transection and Hassab's operation did not show a difference. This might be attributed to the outcome of operation acting as stress, irrespective of the formula. It should be pointed out, however, that the frequency of aggravation of pre-operative gastric mucosal lesions after Hassab's operation is higher than after esophageal transection. It is postulated that with Hassab's operation, selective vagotomy is performed simultaneously with perigastric devascularization, so that gastric acid is rather reduced after operation, and therefore it is not convincing that the major cause of aggravating gastric mucosal lesions is hypersecretion. Rather, the authors would consider that disturbance of bloodflow in the gastric mucosa based on extensive perigastric devascularization accelerated the reduction in defensive factors and aggravated gastric mucosal lesions. More particularly, in patients with liver cirrhosis in whom the functional reserve cell mass of the liver is greatly reduce, Hassab's operation, in comparison with esophageal transection, may possibly induce and aggravate gastric mucosal lesions.

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