

Repeated Endoscopic Sclerotherapy for Active Variceal Bleeding

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Emergency endoscopic sclerotherapy (EEST) during continued moderate to severe bleeding was carried out using a flexible endoscope and absolute alcohol as a sclerosant in 38 patients with variceal bleeding. Portal hypertension was due to cirrhosis in 27, noncirrhotic portal fibrosis in eight, extrahepatic obstruction in two, and Budd-Chiari Syndrome in one patient. A technically adequate EEST could be carried out in 36 (95%) patients, with successful control of variceal bleeding in 35 (92%). Thirty-one episodes of rebleeding occurred in 12 (31.6%) patients. Twenty-nine (93.5%) of these episodes could be controlled with repeated EEST, giving an overall success of 87%. The new approach of repeating sclerotherapy on every rebleeding episode up to a maximum of three courses within 24 hours, use of a wide bore injector, and certain other technical innovations were found safe and effective. The mean (\pm SD) amount of alcohol injected per patient was 9.23 ± 3.3 ml and the mean (\pm SD) number of injections needed per patient were 6.0 ± 3.07 . Complications were minor, transient, and similar to conventional sclerotherapy. There were three deaths, two due to massive rebleeding and one due to hepatic encephalopathy. It can be concluded that EEST is technically feasible during active variceal bleeding and is an effective and relatively safe procedure. It can serve as the first line treatment in this group of patients.

TODAY, ENDOSCOPIC SCLEROTHERAPY (EST) is considered the treatment of first choice for the management of variceal bleeding.^{1,2} A number of questions, however, remain unanswered. One of them is whether EST can be performed and is useful during continued active variceal bleeding. Generally, EST is performed on a semi-emergency basis, once temporary hemostasis has been achieved with the help of balloon tamponade, intravenous vasopressin, or somatostatin.³⁻⁸ The main limiting factor in carrying out emergency EST (EEST) is probably improper visualization of varices and the bleeding spot because of continuous bleeding.³ The second important question is how to deal with an episode of rebleeding after sclerotherapy. A majority of the people resort to balloon tamponade, intravenous vasopressin, or emergency surgery. No information is available whether repeated EEST

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can be performed in such patients, and, if so, how often it can be carried out and whether it is safe and effective.

In an earlier study we had demonstrated in a small number of patients the efficacy of EEST in the control of acute variceal bleeding.² As certain technical modifications were found to be useful in carrying out EEST during active bleeding, we decided to treat prospectively all active variceal bleeding episodes with one or more courses of EEST. All variceal rebleeding episodes were also tackled with EEST, to a maximum of three courses within 24 hours. The present communication deals with our experience of emergency EEST.

Patients and Methods

Out of a total of 132 patients who had undergone EST at our center between March 1983 and February 1985, 38 patients had continued active variceal bleeding. These patients were included in the present trial. Twenty patients had a fresh episode of active variceal bleeding and 18 had bled while undergoing elective EST regimen. The presenting episode of bleeding was designated as index bleed. Any variceal bleeding occurring after this was considered rebleeding. There was a total of 69 episodes of acute variceal bleeding, of which 38 were index bleeds and 31 rebleeds.

All the patients had moderate to severe variceal bleeding.⁹ No associated cause of bleeding was found in any of them at endoscopy. There were 23 males and 15 females with an age range of 1.5 to 73 years, with a mean (\pm SD) age of $31.6 (\pm 16.7)$ years. Portal hypertension was due to cirrhosis in 27, noncirrhotic portal fibrosis in eight, extrahepatic portal obstruction in two, and Budd-Chiari syndrome in one patient. Severity of the underlying liver disease at the time of presentation was graded according to Child's classification¹²; eight patients were in Child's A, nine in Child's B, and 21 in Child's C category. Esophageal varices were graded from 1 to 4.¹³ All patients re-

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ceived resuscitative measures like intravenous fluids, plasma expanders, and blood transfusion. EEST was undertaken immediately in all the patients except in patients who came in shock. In the latter group of patients, EEST was undertaken as soon as the systolic blood pressure came up to about 60 mmHg. No patient was excluded from the trial because of massive bleeding or hepatic encephalopathy.

Technique

EEST was carried out using absolute alcohol as a sclerosant, an indigenously designed Teflon® injector with a 21 gauge needle, and a flexible fiberoptic endoscope (Olympus GIF-Q, D₃ or XP), as described earlier,² except for certain technical modifications and innovations. Attempts were made to keep the field of vision clear by repeated suction and flushing with water. If the endoscopic channel became blocked or the vision of the lens obstructed because of a blood clot, the endoscope was withdrawn, cleaned, and reinserted. Excessive air inflation was often found useful in providing a clear vision. To be sure of achieving a successful intravariceal injection, the transparent Teflon injector was used. Two injectors were kept ready, filled with absolute alcohol, prior to starting sclerotherapy.

A search was made to locate the bleeding spot on the varices before starting injections. If this spot could be seen, the sclerosant was injected at various points all around the lesion, starting from below the bleeding spot. However, if the bleeding point could not be clearly visualized, EST was started from the very bottom of the variceal columns, *i.e.*, from just above the gastro-esophageal (GE) junction. Identification of this area was not difficult despite heavy bleeding. Each and every variceal column was injected. Blanching around the injection site was considered desirable. The amount of alcohol needed to achieve this varied from 1 to 6 ml per variceal puncture site. Injections were restricted to the lower 4–6 cm of the esophagus. Gastric varices, if present, were not injected. The endoscope was withdrawn only after ascertaining effective hemostasis at the variceal injection sites. If this could be achieved, it was accepted as a technically adequate EEST.

In all episodes of rebleeding after EEST, an emergency endoscopy was performed. Repeat injections were given distal to the bleeding spot, if it was visualized; if not, they were given at the bottom of all the variceal columns that did not show ulcer or a whitish opaque color because of prior sclerotherapy.

Analysis

Primary success was considered when the initial episode of bleeding could be successfully controlled at EEST. Rebleeding was defined as any variceal bleeding occurring

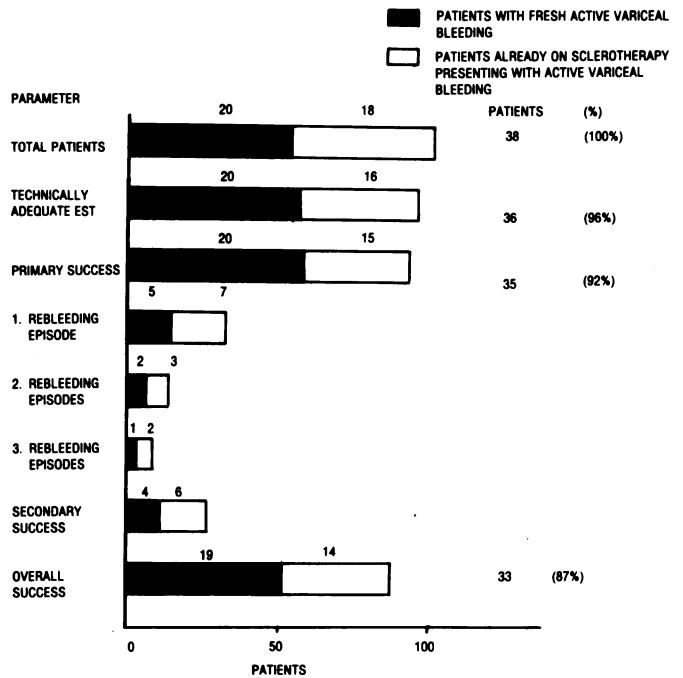


FIG. 1. The figure shows the distribution of patients with active variceal bleeding presenting for EEST and the primary, secondary, and overall success rates of the procedure. ■ shows patients with fresh variceal bleeding; □ shows patients already on sclerotherapy presenting with active variceal rebleeding.

prior to the next course of EST. Secondary success was accepted when a rebleeding episode could be successfully controlled by one or more courses of repeat EST. Overall success was calculated when both primary and secondary successes were taken together. Failure of EST was defined as continuation of active bleeding despite technically adequate EEST.

Results

A technically adequate EEST could be carried out in 62 (92.5%) of the 69 episodes of acute variceal bleeding occurring in 36 (95%) of the 38 patients with portal hypertension (Fig. 1). Primary control of the acute hemorrhage could be achieved in 35 (92%) patients, 20 with a fresh bleed and 15 with a rebleed while on the elective EST regimen. Twelve (31.8%) patients rebled once after entry into the trial, five patients rebled twice, and three patients thrice, making a total of 31 episodes of rebleeding. Twenty-nine (93.5%) of these episodes could be successfully controlled by repeat EEST. A maximum of three EEST courses were given in 24 hours. The mean (\pm SD) and maximum amount of absolute alcohol injected per patient is shown in Table 1. None of the patients showed any obvious alterations in consciousness with intravariceal alcohol injection.

TABLE 1. Results of Emergency Endoscopic Sclerotherapy

Parameter	Value
Total number of patients	38
Mean (\pm SD) alcohol (ml) injected/patient	9.23 \pm 3.3
Mean (\pm SD) injections/patient	6.0 \pm 3.07
Maximum number of injection courses in 24 h/patient	3
Maximum amount of sclerosant injected in 24 h/patient	23 ml
Complications	
Fever	58%
Retrosternal pain	47%
Rebleeding episodes	32%
Oliguria	8%
Increase in ascites	8%
Mortality	8%

The two patients for whom it was not possible to accomplish a satisfactory EEST were already undergoing elective EST. In one of them, an inadvertent puncture of a gastric varix led to massive bleeding and termination of the procedure. In a second patient, diffuse mucosal ulcerations because of earlier EST prevented further injections. In two other patients, despite success in controlling the index bleed and initial episode of rebleeding, variceal bleeding could not be finally controlled with the help of EEST. In the two patients with technical failure and one patient with continued bleeding, balloon tamponade was resorted to and was successful in all three. The fourth patient, however, succumbed to torrential bleeding before balloon tamponade could be undertaken. There were two other deaths; one patient died because of aspiration pneumonia while the Sengstaken tube was in position. The other patient belonged to Child's C class of liver disease and died because of terminal hepatic encephalopathy. Three other patients also developed hepatic encephalopathy after the bleed but subsequently recovered. Minor complications like retrosternal pain, fever, oliguria, and increase in ascites were seen transiently in some of the patients (Table 1).

The bleeding spot could be identified in only nine (24%) patients during active variceal bleeding. An irregular margined hole in five, a longitudinal tear in two, and an ulcer on a varix due to previous EST in another two patients were found responsible for active variceal bleeding.

Discussion

This is probably the first investigative report about the feasibility and efficacy of EEST in continued active variceal bleeding and active rebleeding episodes. EEST was found to be quite useful in controlling active variceal bleeding. A technically adequate EEST could be carried out in 95% of the patients during active bleeding with a primary success rate of 92% in controlling the bleeding.

Rebleeding episodes could also be controlled with repeat sclerotherapy on 29 (93.5%) of the 31 occasions in 10 (83%) of the 12 patients. The overall success of EEST in achieving stable hemostasis was 87%. Except in five (13%) patients, EEST could serve as the sole first line treatment for the control of active variceal bleeding.

Carrying out emergency sclerotherapy during active bleeding was attended with many problems. The identification of the exact bleeding spot could be made in only nine (24%) patients. Our policy of injecting at the bottom of the variceal columns in cases where the actual bleeding point was not identified was found to be effective. The basis for adopting this approach was that most of the varices are known to bleed from within 2–3 cm of the gastroesophageal (GE) junction.¹¹ Injecting all the veins up to about the lower 6 cm of the variceal columns would almost always include the bleeding point. This approach, besides being effective, was found to be technically feasible, as identification of the GE junction and the adjoining variceal columns could be done with little difficulty even during active bleeding.

For the arrest of active variceal bleeding, a rapid and proper intravariceal injection of the sclerosant is most desirable. This, however, is generally quite difficult to achieve because of clogging of the injector needle on the one hand and improper visualization of the varices as a result of continuous bleeding impeding proper intravariceal placement of injections on the other hand. Some of our technical innovations were found useful in overcoming these difficulties. Unlike the conventional Olympus NM-1K injector with a thin 23 gauze needle, the 21 gauze Teflon injector needle used by us allowed rapid introduction of the sclerosant into the veins. Because of its wide bore and the repeated flushing technique, the incidence of clogging of the injector needle was very low. We, however, always kept a spare injector filled with the sclerosant, ready for use. The transparent Teflon injector also facilitated proper intravariceal injections under direct vision, as a small column of blood could be seen rising up in the injector on puncturing the varix and then the sclerosant could be seen to flow into the vein. Blanching of the variceal column around the injection site and hemostasis prior to withdrawal of the endoscope helped us in achieving a uniformly satisfactory technique.

The practice of repeated EEST for the control of rebleeding episodes has probably not been documented in the literature.^{4,12} We found that up to three courses of EEST could be given within a period of 24 hours for the control of rebleeding episodes. This approach was found very useful, safe, and effective, except in patients with diffuse ulcerations over the varices because of earlier EST or a bleeding due to gastric varices. In such patients, balloon tamponade can be used with caution and close supervision.¹⁴

On the basis of the results of our study, it can be concluded that EEST is feasible and quite effective in controlling active variceal bleeding. It can also be used safely and effectively in active rebleeding episodes. However, since the number of patients undergoing aggressive sclerotherapy for rebleeding episodes was not very large, the maximum and optimum number of EEST courses that can safely be given during continued variceal bleeding remains to be determined.

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