Efficacy of Absolute Ethanol Injection Method for Stress Ulcer Bleeding after Major Surgeries

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Emergency endoscopy, carried out in 342 cases of UGI overt bleeding at the Third Department of Internal Medicine, Tohoku University during the six year period from June 1979, demonstrated the necessity of endoscopic hemostasis in 171 cases (50%) with active bleeding, adhered fresh blood clot or exposed vessel with bloody gastric juice. The absolute ethanol injection method was applied to achieve hemostasis in all cases including 30 cases (18%) of postoperative stress ulcer bleeding after major surgeries. Temporary hemostasis was obtained successfully in all 30 cases and rebleeding did not develop. New bleedings in 2 cases (7%) were stopped by repeated injections of absolute ethanol. No patients died from bleeding nor underwent emergency or elective operation. Five patients (17%) died from complicated underlying diseases. Perforation developed in one case (3%). In this case new bleeding occurred on two occasions, and each time hemostasis was obtained. However, this patient showed early symptoms of perforation immediately before the third hemostasis, and was operated on after local injection of absolute ethanol. The complete hemostasis was achieved in 100% of postoperative stress ulcer cases by the ethanol method.

Recent progress in operative techniques and postoperative care of patients, has expanded the range of application of surgical operations and has made operations safer than ever before. On the other hand, postoperative complications have increased, in particular, postoperative gastrointestinal bleedings which are often fatal. In many cases of postoperative stress ulcers the prognosis was poor, and bleeding was severe in comparison with other cases of UGI bleedings. In this report, we discuss the efficacy of the endoscopic hemostatic method of local absolute ethanol injection for stress ulcer bleeding after major surgeries.

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SUBJECTS

Among the 342 cases undergoing emergency endoscopy for overt UGI bleeding in our department during the period of 6 years from June, 1979, 171 cases were treated by an endoscopic hemostatic method using local injection of absolute ethanol. Thirty (17%) of these 171 cases had stress ulcer bleeding following major surgical operations. There 30 patients were subjected to this study to evaluate the efficacy of the absolute ethanol injection method.

METHODS

The technique of absolute ethanol injection method previously reported (Asaki 1981) must be modified slightly subject to subject according to the condition of the bleeding. Fundamentally, correct identification of the bleeding vessel or bleeding site is important for suitable local injection of absolute ethanol. In cases of bleeding associated with exposed blood vessels, 0.1 or 0.2 ml of absolute ethanol is injected locally at several sites 1 to 2 mm from the bleeding vessel and hemostasis is achieved by compression using the tip of the local injector. If this procedure fails to allow sufficient hemostasis the procedure is repeated several times with 0.05 or 0.1 ml of absolute ethanol. In any cases it is important to inject absolute ethanol shallowly into each site intermittently by extracting the injector after top of the needle has been inserted adequately. In cases without exposed blood vessels, several intermittent doses of 0.05 to 0.1 mm of absolute ethanol are injected shallowly. Usually endoscopic hemostasis is performed in the recovery room, ICU, or at the bed side, since bleedings due to stress ulcer after major surgeries often occur there. In cases of massive or repeated bleedings, we incline the bed to elevate the patient's upper trunk before starting emergency endoscopy to prevent mis-swallowing and to assist in the identification of the bleeding site.

RESULTS

Clinical findings of postoperative stress ulcer

The 30 cases of postoperative stress ulcer treated by abosolute ethanol injection method included 27 males and 3 females, a 9 : 1 male dominance. The patients ranged in age from 28 to 80 years with a mean of 57.7 years and included 16 elderly patients (53%) over 60 years. In 54% of the cases the initial peripheral red blood cell count was less than $300 \times 10^4/\text{mm}^3$ before endoscopic hemostasis. Hypoproteinemia with total serum protein of less than 6 g/100 ml was also seen in 63% of the cases. The hemorrhage was attributed to gastric ulcers in 17 cases (57%), duodenal ulcers in 10 cases (33%) and a combination of both in 3 cases (10%). During emergency endoscopy, projectile bleeding was seen in one lesion (3%), pulsating bleeding in 3 lesions (8%), clot associated with exposed blood vessel in 9 lesions (24%) and clot without exposed blood vessel in 21 lesions (54%), venous bleeding in 3 lesions (8%), and capillary bleeding in one lesion. The complicated underlying diseases for which major operations were performed included urological diseases in 10 cases (33%), otorhinolaryngological diseases in 6 cases (20%), orthopedic diseases in 3 cases, disturbances of the pancreatico-biliary system in 3 cases, intestinal diseases in 3 cases, and cerebral diseases in 2 cases. The mean volume of blood transfused was 2,360 ml in 19 cases (63%).
Hemorrhagic shock was seen in 14 cases (47%).

Results of hemostasis by absolute ethanol injection method

Hemostasis or temporary hemostasis was achieved in all 30 cases treated with absolute ethanol injection. Rebleeding developed in none of the cases. In 2 cases new bleeding appeared at other sites but hemostasis was obtained again in both cases. No patient died from bleeding nor underwent emergency operation. In one postoperative patient who had suffered from a femoral fracture in a traffic accident, our method was effective in stopping new bleeding, which showed symptoms of perforation just before the third hemostasis by the ethanol method. This patient was operated surgically after endoscopic hemostasis. Five patients (17%) died from the terminal stage of complicated underlying diseases. Complete hemostasis was obtained in all cases.

Discussion

Recent progress in operative techniques and postoperative care of patients, has expanded the range of application of surgical operations and has made operations safer than ever before. On the other hand, postoperative complications have increased, in particular, postoperative gastrointestinal bleedings which are often fatal. In many cases of postoperative bleeding stress ulcers, the prognosis was poor, and bleedings were severe in comparison with other cases of UGI bleedings. Conventionally, bleedings due to postoperative stress ulcer were treated by blood transfusion and administration of hemostatic agents or anti-ulcer drugs but had a high mortality rate of 42% (Matsubara et al. 1982). Surgical operations also showed high mortality rates of 35.8% (Byrne and Guardione 1973) and 45% (Matsubara et al. 1982). Bleeding due to postoperative stress ulcer is induced not only by the stress after the operation itself but also by those of coexisting complications as described by Sato et al. (1982).
stressors badly affect to each other to exacerbate the general conditions. Therefore, to save the patients it is important to control the bleedings steadily as early as possible using measures with less risk. Out of the 171 cases receiving endoscopic hemostasis by local absolute ethanol injection at our department, 30 cases (18%) experienced bleeding from postoperative stress ulcers. These cases included 14 cases (47%) of hemorrhagic shock. Recently, by various endoscopic hemostatic methods using thermal coagulation Gaisford (1979), Kiefhaber et al. (1986) and Johnston et al. (1985) have obtained favourable results. In our absolute ethanol injection method, the bleeding blood vessel in contracted by the dehydrating and fixing properties of absolute ethanol to produce vasoconstriction and thrombic formation. All types of bleedings can be stopped at the bedside with only absolute ethanol and an endoscopic injector for local injection. Therefore, endoscopic hemostasis can be applied promptly even in ICU or CCU. The most important thing in carrying out our method is to identify the bleeding site correctly. For this purpose, the table for the endoscopic examination should be slanted to carry out topical lavage and suction adequately under direct endoscopic observation. Since postoperative stress ulcers are mostly found in the corpus of the stomach, the above-described procedures are important to locate the bleeding site. Cases showing active bleeding, adhesion of fresh blood clot and exposed blood vessel associated with bloody gastric juice were subjected to for endoscopic hemostasis. After hemostasis was obtained with the absolute ethanol injection method, the patients were fasted to rest the treated area; a naso-gastric tube was not used. Moreover, sufficient blood transfusion, intra-venous administration of a histamine H₂ receptor antagonist and hemostatic agents were prescribed. On the other hand, treatment for the complicated underlying diseases is also important. If the bleeding site became stable enough by endoscopy, oral alimentation should be started as early as possible. Even in the treatment of bleeding from postoperative stress ulcers, which are said to have poor prognosis in many cases, the efficacy of local injection of absolute ethanol was highly effective. It was even possible to treat patients conservatively except the patients who died from terminal stage of complicated malignant tumors. In particular, since the absolute ethanol injection method is simple to use and can be repeated, it may well be said to be the first choice hemostatic measure for the G-I tract bleedings.

References

