

Research Article

NTAN Injection is Effective Novel Rescue Treatment for Acute Non-Variceal Upper Gastrointestinal Bleeding

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Abstract

Objective: To investigate the clinical effect of NTAN injection in acute non-variceal upper gastrointestinal bleeding.

Methods: From January 2017 to December 2018, in the department of Gastroenterology, Affiliated Hospital of Jiujiang University, 15 patients suffering from acute non-variceal upper gastrointestinal bleeding have undergone NTAN injection as the case group. At the same time, 40 patients who received routine hemostatic clips were selected as control group. The time of negative conversion of occult blood in stool, days of hospitalization, effective hemostasis and immediate hemostasis in two groups were observed.

Results: The time of fecal occult blood turning negative and the length of hospital stay in the case group were less than that in the control group, and the effective hemostasis and immediate hemostasis were higher than those in the control group, with statistically significant differences ($P < 0.05$).

Conclusion: The effect of NTAN injection on acute non-variceal upper gastrointestinal hemorrhage is significantly better than that of hemostasis clip, and the therapeutic effect is more significant. It can improve the clinical symptoms of patients and has a high safety. It is worthy of promotion and application.

Keywords: NTAN injection; Acute non-variceal upper gastrointestinal bleeding; Endoscopic hemostasis; Occult blood in stool

Introduction

Acute the varices sex upper gastrointestinal hemorrhage (Acute Non Variceal Upper Gastrointestinal Bleeding, ANVUGIB) means closely ligaments more digestive tract caused by bleeding varices sex disease, also including the pancreatic duct or bile duct bleeding and jejunum anastomosis near postoperative anastomotic disorders caused by stomach bleeding. Common causes include peptic ulcer, portal hypertensive gastropathy, acute gastric mucosal lesions, and gastric cancer [1,2]. In addition, ectopic varicose veins, antral telangiectasia, hepatic gastrointestinal failure and other rare causes may also cause upper gastrointestinal bleeding [3,4]. At present, with the rapid development of medicine, for acute non-varicose upper gastrointestinal bleeding, many scholars believe that hemostasis should be performed within 24 h. With the development of endoscopic technology, endoscopic hemostasis has gradually become the first

choice of treatment. Endoscopic therapy generally includes spraying drug therapy, injection drug therapy, mechanical hemostasis and combined therapy, among which, hemostatic clip is the most widely used in mechanical hemostasis, which has advantages of simple operation, low cost and low recurrence rate. NTAN injection is the endoscopic sequential embolization NTAN method. The method is to find the bleeding site under the endoscope and inject the peripheral blood vessels and the lesion submucosal with the sequential injection of normal saline of 3.0 ml+ tissue glue of 0.5 ml+ air of 2.5 ml+ normal saline of 3 ml (NTAN). If there is no active bleeding at the bleeding site, the hemostasis is successful; otherwise, the method can be recirculated. The aim of the study was to investigate the efficacy of NTAN injection in acute non-varicose upper gastrointestinal bleeding.

Patients and Methods

This was an observational, open-label, retrospective, single-arm case series conducted at the department of Gastroenterology, Affiliated Hospital of Jiujiang University from January 2017 to December 2018. Fifteen patients with acute non-varicose upper gastrointestinal bleeding who received NTAN injection were included in the case group, including 12 males and 3 females, with an average age of 53.82 ± 17.94 years. 40 patients who received conventional hemostatic clip therapy in the same period were selected as the control group, including 28 males and 12 females, with an average age of (46.70 ± 11.75) years. There was no statistically significant difference in gender and age between the two groups, indicating clinical comparability.

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This study was approved by the ethics committee of our hospital, and all subjects signed informed consent (Table 1). All of the procedures were performed by one endoscopist. Inclusion criteria were as follows.

Table 1: Comparison of patient basic information between the two groups.

Group	No	Gender (Male/Female)	Age (years old)
Case	15	12/3	53.82 ± 17.94
Control	40	28/12	46.70 ± 11.75
t/ χ^2		0.550	1.063
P		0.458	0.301

- All patients were clinically diagnosed in accordance with the guidelines for the diagnosis and treatment of acute non-varicose upper gastrointestinal bleeding [5].
- The patients have hematemesis, black feces and other clinical manifestations, with or without hemorrhagic peripheral circulation failure clinical manifestations.
- Positive testing for vomiting or fecal occult blood (++ or above).
- The concentration of Hemoglobin (Hb), RBC count and HCT were decreased and urea nitrogen was increased.
- Forrest classifications of the lesions were Ia, Ib, IIa and IIb.

Exclusion criteria include patients with severe functional abnormalities of heart failure, liver and kidney failure and other important organs and unable to tolerate endoscopic examination. Control group was assisted using titanium clips hemostatic treatment under the endoscope. The procedure was at first endoscopic examination, washing and focuses were exposed. Endoscopic pliers will push to endoscopic front-end and open metal clip. Bleeding lesions were light pressure, and allowed them to tighten. Before the metal clip was broken off, then repeat release titanium clip lesions, clip lesions after again using normal saline to rinse lesion in patients with confirmed finally will endoscopic exit without bleeding (Figure 1). Cases endoscopic used NTAN injection therapy. Firstly patients were had endoscopic examination, rinsed after exposed to lesions, found the bleeding site, bleeding to the vascular branch into submucosal lesions sequential injection of saline solution 3.0 ml + organization glue 0.5 ml + air 2.5 ml + 3 ml saline (NTAN), after the use of saline to rinse lesion in patients with confirmed presence of bleeding, if there is no active bleeding, known as hemostatic success, otherwise, the law has been recycled. All patients' fecal occult blood negative conversion time, length of hospital stay, effective hemostasis and immediate hemostasis were recorded. The patients were checked for fecal occult blood every day after operation. No active bleeding was observed at the time of endoscopic treatment, indicating immediate hemostasis. No more bleeding or surgery was performed within 120 hours after the operation, indicating effective hemostasis, or invalid hemostasis. Hemoglobin level, hematocrit, number of units of packed red cells transfused prior to the procedure, presence of clinically evident shock, number of attempted prior endoscopic procedures, lesion type, location, size, Forrest classification of the lesion, technical and clinical success, complications, and follow-up clinical outcome were reviewed. SPSS20.0 statistical software was used to compare the enumeration data by chi-square test and the measurement data by independent sample t-test. $P < 0.05$ indicated that the difference was statistically significant.

Results

Patients in the case group had less time to turn negative of fecal

occult blood and longer hospital stay than those in the control group, while patients in the effective hemostasis and immediate hemostasis were higher than those in the control group, with statistically significant differences ($P < 0.05$) (Table 2). Hemostasis was achieved in all patients in case group and without rebleeding occurred after NATA placement for 12 months. Typical images of deployed NTAN showing in the Figure 2. A patient with an active bleeding was successfully treated with an injection of NTAN. The patient with duodenal ulcer was bleeding and treated by NTAN. No bleeding was found at 12 months of follow-up (did not show the images). The images were taken on the 5th month after NTAN as shown in Figure 3.

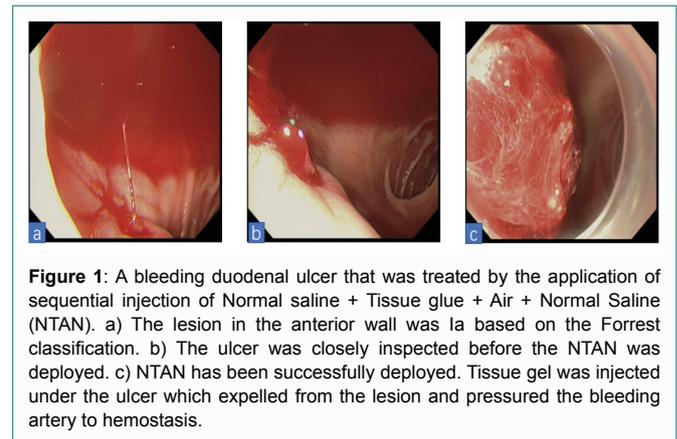


Figure 1: A bleeding duodenal ulcer that was treated by the application of sequential injection of Normal saline + Tissue glue + Air + Normal Saline (NTAN). a) The lesion in the anterior wall was Ia based on the Forrest classification. b) The ulcer was closely inspected before the NTAN was deployed. c) NTAN has been successfully deployed. Tissue gel was injected under the ulcer which expelled from the lesion and pressured the bleeding artery to hemostasis.

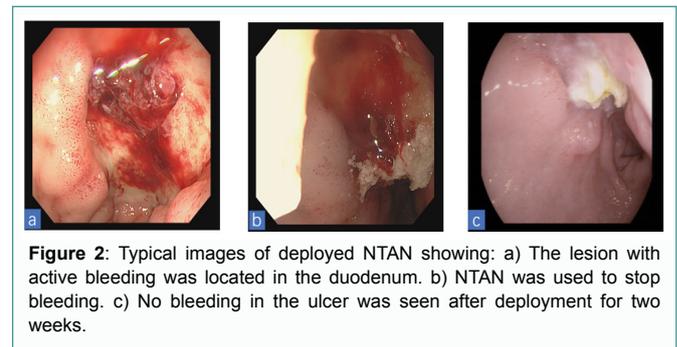


Figure 2: Typical images of deployed NTAN showing: a) The lesion with active bleeding was located in the duodenum. b) NTAN was used to stop bleeding. c) No bleeding in the ulcer was seen after deployment for two weeks.

Table 2: Comparison of clinical symptom improvement between the two groups.

Group	No.	Time of fecal occult blood turns negative (d)	Hospital stay (d)	Effective hemostatic [n(%)]	In time hemostatic [n(%)]
Case	15	3.30 ± 0.57	7.20 ± 1.31	15(100)	15(100)
Control	40	5.10 ± 0.65	8.80 ± 0.84	30(75)	31(77.5)
t		4.648	2.309	4.583	4.035
p		0.002	0.046	0.032	0.045

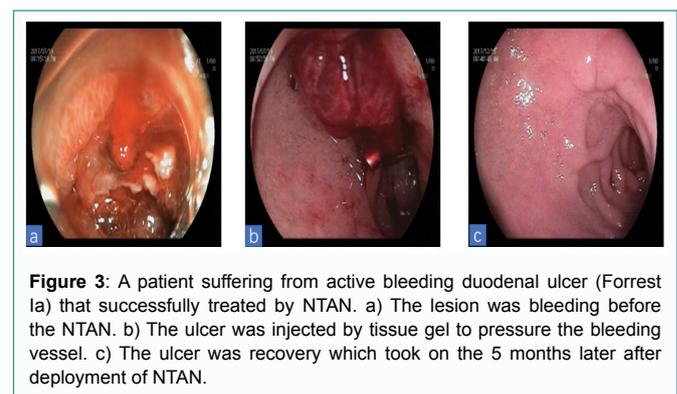


Figure 3: A patient suffering from active bleeding duodenal ulcer (Forrest Ia) that successfully treated by NTAN. a) The lesion was bleeding before the NTAN. b) The ulcer was injected by tissue gel to pressure the bleeding vessel. c) The ulcer was recovery which took on the 5 months later after deployment of NTAN.

Discussion

An analysis of the risk factors of recurrent bleeding in patients with ANVUGIB and its clinical significance showed that the annual incidence was (19.4-57.5)/100,000, and the incidence of recurrent bleeding 7 days after onset was 13% [6]. The etiology of ANVUGIB is mostly caused by upper gastrointestinal diseases. A few are caused by biliary and pancreatic diseases, among which peptic ulcer, upper gastrointestinal tumor, stress ulcer and acute and chronic mucosal inflammation of the upper gastrointestinal tract. Recently non-steroidal anti-inflammatory drugs (NSAIDs), aspirin or other anti-platelet aggregation drugs have gradually become an important cause of upper gastrointestinal bleeding [7-9]. Some systemic diseases, such as infection, liver and kidney dysfunction, clotting mechanism disorder, connective tissue disease, can also cause upper gastrointestinal bleeding. Studies have shown that the most common causes of upper gastrointestinal bleeding in China include peptic ulcer, acute gastric mucosal lesions, upper gastrointestinal malignancies and esophageal and gastric varices [10,11]. Endoscopic hemostasis for ANVUGIB has rapid onset and definite curative effect. In 2015, China's "guidelines for the diagnosis and treatment of ANVUGIB" has made it the first choice for treatment. It is recommended to perform endoscopic hemostatic treatment for the hemorrhagic lesions with Forrest classification Ia~IIb. The commonly used methods of endoscopic hemostasis include local injection of drugs, hemostasis by heat coagulation and mechanical hemostasis [12-14]. Clinical evidence shows that, on the basis of drug injection therapy, combined with a thermo coagulation or mechanical hemostasis method, can further improve the hemostatic effect of local lesions [15-17]. The metal titanium clip hemostasis is based on the physical and mechanical principles. The mechanical force of the metal titanium clip when it is closed can compress the bleeding blood vessels and surrounding tissues of the patient's body, blocking the blood flow, so as to achieve the purpose of effective hemostasis [18,19]. Nevertheless, due to the influence of large amount of blood on endoscopic field of view, different texture hardness of ulcer, non-classic parts such as the posterior wall of duodenal bulb, the side of the small curved body of the stomach horn, the side of the small curved body of the cardia, and the large area of ulcer, hemostatic clamp failed to close the blood vessel. Endoscopic auxiliary examination can improve the surgical field of vision to a certain extent, fully expose the lesion, and greatly avoid the damage to the relevant tissues of the patient's body caused by blind forceps, and even lead to failure of hemostasis, increase hemostatic effect, and reduce patients' repeated bleeding. And traditional way of drug injection, although the same under the endoscope assisted examination, surgical field wide enough, but the therapeutic effects of drug injection time is relatively short, patients are prone to bleeding again, cause other adverse symptoms occur at the same time, in addition, the drug injection bleeding has a certain repeatability, patients may be repeated hemorrhage after treatment, treatment effect is poorer, not suitable for large vascular hemorrhage [20-22]. Therefore, this kind of treatment will affect the health of patients, reduce the compliance of patients with treatment, and seriously affect the rehabilitation of patients. In this study, it was found that patients in the case group had less time to turn negative of fecal occult blood and fewer days of hospital stay than those in the control group, while patients in the effective hemostasis and immediate hemostasis were higher than those in the control group, with statistically significant differences. The results showed that the effect of NTAN injection on ANVUGIB was significantly better than that of hemostatic clip. In summary, acute the varices sex of

hemorrhage of upper gastrointestinal tract endoscopic hemostatic treatment, on the basis of various empirical methods, creatively put forward and the application of endoscopic NTAN injection technique for the first time, its principle is to use normal saline in the submucosal form a false lumen, fast (3 seconds) will organize the glue injection, into the air will organize glue loose expansion at the same time, at last, by physiological saline to push all the air into the submucosal mixed saline group in the short term plastic swell gradually hardening, and oppression relevance of the source of the vessels. The technique has achieved a significant hemostatic effect, especially for lesions with active bleeding, rare bleeding sites or cases where conventional hemostatic methods are difficult to achieve the purpose of hemostasis, and has a significant remedial and alternative effect. The method was to find the bleeding site under endoscope and inject 2.0 ml of normal saline + 0.5 ml of tissue glue + 2.5 ml of air + 2 ml of normal saline (NTAN) into the surrounding submucosa of the bleeding site in a rapid sequence. If there is no active bleeding in the bleeding site, the hemostasis is successful; otherwise, the method can be circulated. In the 15 cases of patients who have completed NTAN hemostatic treatment, no reissue of blood was found, the hemostatic effective rate was 100%, and no postoperative complications were found in the patients, and the cost was economical, worthy of study and promotion. Honestly, we want to address potential limitations of the study. It is retrospective and therefore has the limitations of any such study. Besides, it reflects the experience of a clinical center; however, the scopes used are present in most hospitals. All in all, NTAN represents an effective, easily performed, and safe endoscopic therapeutic modality for various causes of ANVUGIB. We were able to demonstrate its usefulness as a novel treatment for ANVUGIB hemostasis.

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