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ResearchArticle

SELECTION OF ENDOSCOPIC INTERVENTIONS IN THE PREVENTION OF REBLEEDING IN PATIENTS WITH PORTAL HYPERTENSION

[1]Shavkat Karimov, [2]Utkirbek Matkuliev, [3]Murad Khakimov and [4,*]Bekhzod Abdullaev, [5]Sheroz Ashurov, [6]Shukhrat Kholmatov

[1]Department of Faculty and Hospital Surgery of the Tashkent Medical Academy, Academician of the Academy of Science in Uzbekistan
[2]MD, Tutor of the Department of Faculty and Hospital Surgery, GP faculty, Tashkent Medical Academy, Uzbekistan
[3]MD, PhD, Head of the Department of Faculty and Hospital Surgery, GP faculty, Tashkent Medical Academy, Farobi-2, Almazar district, Tashkent, Uzbekistan
[4]Junior scientific researcher, General practitioner faculty in Tashkent Medical Academy, 41-14, 5 block, Chilanzar District, Tashkent, Uzbekistan
[5]MD, Department of Faculty and Hospital Surgery, GP faculty, Tashkent Medical Academy, Uzbekistan
[6]MD, Department of Faculty and Hospital Surgery, GP faculty, Tashkent Medical Academy, Uzbekistan

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Introduction: Bleeding from esophageal varices (varicose veins) is one of the leading causes of death in patients with portal hypertension (PH). The main method of prevention of bleeding is endoscopic procedures.
Background: To assess the effectiveness of endoscopic ligation (EL) in the prevention of bleeding varicose veins (VVs) of the esophagus and stomach in patients with PH.
Material and Methods: We analyzed the results of treatment of 183 patients with PH who had had previously an episode of bleeding from VVs of esophagus or stomach. All patients observed endoscopic examination to determine the degree of VVs and assess the risk of bleeding. The first group included 96 patients who underwent endoscopic sclerotherapy (ES) polidocanol micropinch in the form of particles; the second group included 87 patients who were produced endoscopic ligation (EL) VVs of the esophagus.
Results: The observation period ranged from 18.8±18.6 to 22.2±26.2 months. After EL, in contrast to the ES, a complete obliteration of VVs was less than the number of rebleeding, decreased mortality. At control endoscopy, the recurrence of VVs of the esophagus and stomach was detected in 11.4% patients of the first group and in 3.1% of the second group. After EL, almost all patients were observed complications such as transient dysphagia, chest pain, but often after ES occurred over such terrible complications as pleurisy, sepsis syndrome, dysphagia, and bleeding from ulcers sclerosed plot.
Conclusion: The EL method has obvious advantages over the ES.

INTRODUCTION

Liver cirrhosis (LC) and portal hypertension (PH) is one of the most serious problems of modern surgical hepatology. The most common complication of liver cirrhosis – bleeding from varices of esophagus and stomach – the main cause of deaths in the surgery, and complications such as ascites, hepatic encephalopathy and hepatorenal syndrome – disability of patients (Sato, 2015; Ríos Castellanos *et al*., 2015; El-Karaksy *et al*., 2015; Sarin and Kumar, 2014; Miyaaki *et al*., 2014). Annually, bleeding from the esophagus and stomach GI occur in 4-15% of patients with PH. Fatal outcome in first episode of bleeding occurs in 30% of patients (Miyaaki *et al*., 2014;Crisan*et al*., 2014;Triantos and Kalafateli, 2014;Kondo *et al*., 2014; Romano *et al*., 2014; Kim *et al*., 2013; Li *et al*., 2013; Mustafa and Stanley, 2014). More than 60% of those survivors of the first episode of bleeding during the period from 3 to 6 months, have a high risk of re-bleeding and in others it arises during the year.

****Corresponding author: Bekhzod Abdullaev,***
Junior scientific researcher, General practitioner faculty in Tashkent Medical Academy, 41-14, 5 block, Chilanzar District, Tashkent, Uzbekistan.

Therefore, all patients who have had a first episode of bleeding should receive treatment to prevent recurrence of varicose veins (Ríos Castellanos *et al*., 2015;El-Karaksy *et al*., 2015). Today experts has several ways to prevent rebleeding from varices: pharmacotherapy, endoscopic intervention, transjugular intrahepatic portosystemic shunt (TIPS), a surgical portocaval bypass (6). Endoscopic interventions for eradication of varices is the "gold standard" of treatment for patients with bleeding. However, this intervention did not reduce portal pressure, so varices after endoscopic treatment may recur (Sarin *et al*., 2014). Such patients need to be dynamic endoscopic control or hold decompression angiographic interventions.With experience of endoscopic interventions in patients with PH there is a need to systematize the errors and dangers in their carrying out, to clarify the pathogenesis of complications arise, develop tactics and medical indications for endoscopic sclerotherapy (ES) or endoscopic ligation (EL) for the prevention and treatment of esophageal-gastric bleeding in PH. **Objective:** To assess the effectiveness of endoscopic procedures in patients with bleeding from varices of the esophagus and stomach in PH.

MATERIALS AND METHODS

During 2012-2014 years on the 2nd Clinic of Tashkent Medical Academy under our supervision there were 183 patients with bleeding from varices of the esophagus and had a history of episode of bleeding as a complication of PH. The average age was 46.3 ± 17.2 years. Among them 138 patients (75.4%) were males. Bleeding was in history of 113 (61.7%) patients. The duration of the bleeding averaged 11.8 ± 6.6 hours. Ascites was observed in 48.6% of patients, some of them had resistant character of ascites. To assess the severity of liver failure used Child – Pugh classification. The severity and prevalence of varices of the esophagus and the stomach were evaluated by classification of N. Soehendra, K. Binmoelle. Endoscopic intervention was made in order to stop and prevent bleeding from varices of the esophagus. To evaluate the efficacy of endoscopic surgery, patients were divided into two groups. First group consisted of 96 patients who underwent ES (paravasal and intravasal ways) of varices of the esophagus; the second group included 87 patients who underwent EL (Table 1).

Endoscopic procedures are performed in an emergency, and in a planned manner. In 79 patients at admission to temporarily stop the bleeding and stabilize the hemodynamic parameters was used Blackmore tube. Subsequently, for them was performed ES or EL (Table 2).The study excluded patients with esophageal varices with gastric bleeding, concomitant cancer, renal failure, or other competing diseases previously undergone sclerotherapy or any endovascular intervention. During the examination, patients did not take β-blockers.

The technique of endoscopic sclerotherapy and ligation:

A procedure was performed in the endoscopy room using a fiber-optic endoscopy, endoscopic instruments of firm Olympus (GIF-10), endoscopic injector. Emergency ES was carried out after a gastric lavage, delayed - after stopping the bleeding by Blackmore tube. We used intravasal and paravasal sclerotherapy by 1% polidocanol solution. During one session of ES administered 15-18 ml 1% sclerosant into two or three varicose veins below the bleeding. Reintroducing of sclerosants to other varicose veins of the esophagus was performed at intervals of 3-4 days. EL was performed on an empty stomach with a device consist of from 6 or 10 rings of firm Wilson-CookMed Ine. Ligation was started with the cardioesophageal region and continued cardioesophageal above staggered helix (Fig. 1 and 2). Given that, EL was performed using multiligating apparatus in one session made "circular" ligation of all varicose veins of the esophagus, since the level of the gastroesophageal junction. If necessary, re-ligation of varices was carried out a month later.

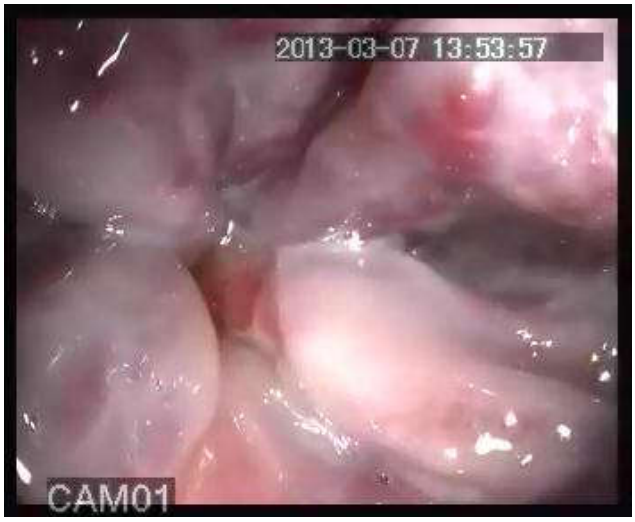

Fig. 1. 2. Before and after Endoscopic ligation of esophageal varices

After treatment, patients in both groups every first and third months underwent endoscopy, which allows detecting recurrence of varices of the esophagus, worsening of portal gastropathy or occurrence of varices stomach. In moderate portal gastropathy macroscopic gastric mucosa had a kind of mosaic. In severe portal hypertensive gastropathy mucosal detected cherry stain and / or black-brown color. In patients with recurrent varices in the esophagus, repeated procedures of EL or ES performed until resolution of varices of the esophagus.

RESULTS

To evaluate the results of treatment, we studied the frequency of recurrent bleeding, rate of complications and mortality in the early postoperative period. The number of procedures that needed to resolve varices for the period of hospitalization in the two groups of patients differed significantly, accounting for 2.3 ± 0.4 bed-days in 1st group and 1.0 ± 0.2 in the 2nd one. It should also be noted that the period of hospitalization of patients who have had ES, was greater than in patients with EL (Table 3).

Analysis of results of ES and EL in patients with bleeding showed significant efficacy of ligation method in comparison with sclerotherapy. If ES to eradicate varicose veins of the esophagus the patient was subjected to repeated endoscopy, EL is performed in a single session using a multiply ligation device. Most often during ES we faced such a problem as bleeding from the injection points (25.0%), which required prolonged compression of the distal end of the endoscope location of bleeding after the introduction of varicose vein sclerosing agent. Deterioration of portal gastropathy was observed in 8 (9.2%) after EL and 23 (23.9%) after sclerotherapy (p <0,05). After endoscopic intervention in 1 patient of 1st group there was a perforation of the esophagus, which ended with the death of a patient from septic shock. Complications after EL to no deaths resulted.

Table 1. Distribution of patients according to the class of liver failure and the extent of varices of the esophagus and the stomach, n=183, absolute (%)

Clinical index	Control group, n=96	Main group, n=87
Liver failure by Child – Pugh		
Class A	12 (12.5)	9 (10.3)
Class B	63 (65.6)	49 (56.3)
Class C	21 (21.9)	29 (33.3)
The degree of varices of the esophagus and the stomach		
II	25 (25.7)	27 (31.0)
III	62 (64.6)	48 (55.1)
III with transition into the stomach	9 (9.7)	12 (13.9)

Table 2. Distribution of patients with varices of esophagus and stomach, depending on the type of intervention, absolute (%)

Type of intervention	1st group	2nd group
Emergency endoscopic hemostasis	27 (28.1)	2 (2.3)
Emergency delayed intervention:	36 (37.5)	43 (49.4)
- *hemostasis achieved by Blackmore tube*	25 (26.1)	39 (44.8)
- *independent hemostasis*	11 (11.4)	4 (4.6)
Routine endoscopic intervention:	33 (34.4)	42 (48.4)
- *bleeding in anamnesis*	25 (26)	29 (33.3)
- *high risk of bleeding*	8 (8.4)	13 (15)
Overall	96	87

Table 3. Results of treatment of patients with bleeding from varices of the esophagus and the stomach

Clinic criteria	1st group	2nd group
The duration of hospitalization, days	10.1±2.4	6.2±1.8
The duration of hospitalization, minutes	30-45	10-15
The amount of sessions during hospitalization sessions	2.3±0.4	1.0±0.2
The number of sessions for 1 year	2.8±0.5	1.5±0.5

Table 4. The results of treatment in patients with comparison groups, absol. (%)

Complications	1st group	2nd group
Deep ulcers	22 (23)	1 (1.1)
Pleural effusion	18 (18.7)	1 (1.1)
Esophageal perforations	1 (1.04)	-
Cicatricial strictures	7 (7.3)	-
Transient bacteremia	5 (5.2)	-
Bleeding from the point of injection	24 (25.0)	-
Dysphagia (transient)	17 (17.7)	81 (93.1)

At the same time, some of the complications, such as dysphagia and chest pain in patients undergoing EL occurred statistically significantly more frequently than in patients after ES - respectively, 81 (93.1%) and 17 (17.7 %). Transient bacteremia occurred in 5 (5.2%) patients after ES ($p > 0.05$). Deep ulcers were more common in patients who underwent ES (Table. 4).

Bleeding in the early postoperative period in 1st group recurred in 19 (11.4%) patients, in the 2nd - in 1 (1.1%). In all these patients the first stage set the Blackmore tube followed by endoscopic control, and then, if necessary, repeated endoscopic intervention. In 5 patients with recurrent bleeding probe-obturator stop it failed, all of them require open surgery. The mortality rate after surgery was 60% (3).In 1st group, mortality was 9.4% (9 patients).

The cause of death of 1 patient was the septic condition, which occurred after the perforation of the esophagus with the development of mediastinitis, three patients died as a result of recurrent profuse bleeding, 5 - due to the progression of liver disease. In 2nd group, there were no deaths.In the remote period after treatment (1-12 months). Recurrence of varices of the esophagus were noted in 19 (19.7%) patients after ES and in 2 (2.1%) - after EL ($p < 0,05$). Moreover, recurrent bleeding from varices occurred respectively in 9 (23%) and 2 (2.1%) patients.

DISCUSSION

Despite the fact that the surgical hepatology in the last decades have been achieved great success, bleeding from varices of the esophagus is one of the most severe complications of PH. Many experts says (Crisan *et al*., 2014; Triantos and Kalafateli, 2014; Kim *et al*., 2013) that all patients who had a history of at least one episode of bleeding from varices, must undergo minimally invasive techniques for the prevention of recurrence. Numerous studies have shown that ES is more effective than open surgery. In its implementation spent significantly less time, varicose veins are resolved in a relatively short time, less risk of rebleeding and development of various complications. At the same time, in the opinion of many authors, after ES saved higher recurrence varices, because it is impossible to carry out obliteration of gastric varices (Kondo *et al*., 2014; Romano *et al*., 2014).

A better treatment for bleeding varices of the esophagus is EL. Meta-analysis of the results of the application of EL and ES showed the advantage of ligature treatment in the prevention of bleeding varices of the esophagus to the sclerosing method (Li *et al*., 2013).The authors of the few works that we have found in the literature suggest that ES in its effect does not exceed EL, in addition, to date repeatedly shown that EL for bleeding from varicose veins of the esophagus is a safe and economical procedure. According to the World Health Organization, EL is the "gold standard" for the prevention and treatment of bleeding of varices from the esophagus, which is also confirmed by the results of our studies (Mustafa and Stanley, 2014; Tantau *et al*., 2013).

In our study, the number of varicose veins in second group was significantly lower than in the 1st (respectively 2.1 and 19.7%), rebleeding occurred in 9 (23%) patients after ES and 2 (2.1%) - after EL. Portal gastropathy was observed, respectively, in 23.9 and 9.2% of patients. The reason for this, in our opinion, is that deep ulcers after sclerotherapy are the result of the development of fibrous tissue, which leads to the obliteration of the perforated veins of the esophagus and, consequently, an increase in portal pressure and the redistribution of blood in the portal vascular system (Tantau *et al*., 2013; Myung *et al*.,2013). Complications after EL of varicose veins are rare and symptomatic "softer" than after ES. Chest pain and dysphagia, as a rule, have a transitory nature. After ES, there are numerous complications, such as dysphagia, chest pain, fever, small pleural effusion, ulcers and esophageal strictures. The most serious side effects of sclerotherapy - dysphagia, esophageal stricture and bleeding from esophageal ulcers, which can be more than 14% of episodes of recurrent bleeding (Kondo *et al*., 2014).

Analysis of the literature showed that, despite the large number of different methods of prevention and treatment of bleeding varices of the esophagus and stomach, absolutely effective method of providing a reliable and final stop and prevent bleeding, contributes to the maintenance and normalization of liver function, is currently not exist. The variety of violations of the portal circulation, liver function, blood flow especially in gastroesophageal zone polymorphism of clinical manifestations determine the need for an individual approach to the choice of endoscopic treatment and prevention of bleeding from varices of the esophagus and stomach.

CONCLUSION

Despite the fact that the assessment of various methods of stopping and prevention of bleeding varices of the esophagus is not completely finished, there is a tendency to the predominant use of endoscopic methods, among which the main role belongs to EL.

CONSENT

It is not applicable.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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