

Ultrasonic endoscopy guiding to cut scar of esophageal stricture after variceal sclerotherapy

Yuandong Zhu (✉ zhuyuandong2022@163.com)

HangZhou Xixi Hospital

Fulong Zhang

HangZhou Xixi Hospital

Jing Xu

HangZhou Xixi Hospital

Yan Shi

HangZhou Xixi Hospital

Bo Wu

HangZhou Xixi Hospital

Hai Wang

HangZhou Xixi Hospital

Chaojun Huang

HangZhou Xixi Hospital

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Abstract

Objective: We want to investigate the efficacy of ultrasonic endoscopy guiding to cut scar of esophageal stricture after variceal sclerotherapy.

Method: The data of 10 patients with esophageal stricture after esophageal varices sclerotherapy injection (ESI) in our hospital from September 1, 2021 to December 31, 2021 treated by cutting the scar guided by ultrasonic endoscopy were retrospective, and the efficacy was evaluated.

Result: The dysphagia was obviously relieved in 9 patients during follow-up, and 1 patient suffered dysphagia again after the treatment.

There was no complications of perforation, bleeding and infection among the patients.

Conclusion: Ultrasonic endoscopy guiding to cut scar was safe and reliable, which could reduce the occurrence of perforation and bleeding.

Introduction

Esophageal stricture is one of the complications after ESI.^[1] It is related to local inflammation, ulceration, and fibrosis caused by multiple EIS.^[2-3] The main symptom of esophageal stricture is dysphagia. The standard treatment for esophageal stricture after ESI is not mentioned in international guidelines.^[4] Furthermore, patients are often accompanied by prolonged prothrombin time and thrombocytopenia, and balloon dilation for stricture complicated by ESI for esophageal varices has poor outcomes.^[1]

Method

Object

We reviewed the data of 10 patients with esophageal stricture after ESI in our hospital from September 1, 2021 to December 31, 2021 treated by cutting the scar guided by ultrasonic endoscopy.

Inclusion criteria

- According to Stooler classification^[5], the degree of esophageal stricture was grade II-VI.
- Diameter of esophageal cavity was more than 2.6mm, where ultrasonic endoscope could pass.
- The esophageal stricture did not be treated with surgery.

Exclusion criteria

□ Disorder of coagulation was severe. □ The signs of vital were unstable. □ Heart, brain, lung, or other organ was failure. □ Esophageal malignancy was found.

Assessment

The degree of esophageal stricture and dysphagia^[5]: Grade 0: There is no dietary restriction; Grade I: Soft food can be eaten smoothly, and the food whose diameter is more than 13 mm can be passed; Grade II: Semi-liquid food whose diameter is among 8 to 13 mm can be passed; Grade III: Only liquid diet whose diameter is among 3 to 8 mm; Grade IV: Liquid diet was difficult to be passed, whose diameter is less than 3 mm.

The relief criteria of esophageal stricture: □ The degree of stricture recover to grade 0-I. □ The body of standard gastroscope can pass through esophagus without any resistance, and the diameter gastroscope is 1 cm. □ There will be no stricture recurred during the follow-up 8 weeks. ^[6]

Criteria of stricture recurred: □ The degree of stricture worsen to grade II-IV again. □ The body of standard gastroscope can not pass through esophagus without any resistance.

Endoscopic treatment

At first, We should observe the retention in the esophageal cavity through gastroscopy. If amount of fluid and/or solid was blocked by the stricture, it was necessary to remove the residue. When the esophageal stricture exposed entirely (Figure.1), we used the microprobe of ultrasoic endoscope to scan the esophageal stricture.(Figure.2) After measuring the location and depth of stricture scar, we used the dualknife to cut the scar by longitudinal axis according to measurement.(Figure.3) However, we should be alert to slit the longitudinal muscle of the esophagus.

Result

General data: Gender: There were 7 males and 3 females; Age: The average age was 47 years, ranging from 35 to 59 years; Reason of cirrhosis: There were 9 cases of hepatitis B, and 1 case of alcoholic cirrhosis; Child-Plug classification: There were 4 cases of grade A, 4 cases of grade B, and 2 cases of grade C. Portal thrombosis: There were 3 cases combined portal thrombosis. Hepatocellular carcinoma(HCC): There were both 2 cases combined with HCC. Splenectomy: There were

3 cases treated with Splenectomy. Antiviral: There were 7 cases treated with antiviral; Time of ESI: There were among 1 to 6 times of ESI before. Time of dilation: There were among 0 to 4 times of dilation for stricture before. Thick of scar: The thick of stricture scar was 1.1 to 3.9mm. Location of scar: Distances to incisor of the scar was among 34 cm to 39 cm, and directions of scar were at one o'clock, two o'clock, nine o'clock, ten o'clock, eleven o'clock, twelve o'clock. Degree of stricture: There were 3 cases with grade II, 5 cases with grade III, 2 cases with grade IV. (Table. 1)

Table.1 The general data of the patients

General date	case1	case2	case 3	case4	case5	case6	case7	case8	case9	case10
Gender	F	M	M	M	M	M	F	F	M	M
Age	44	35	58	45	39	59	44	53	56	38
Cirrhosis	HEB	HEB	ALC	HEB						
Child-Plug	B	A	B	A	C	B	B	A	A	C
HCC	-	-	+	-	-	+	-	-	-	-
Portal thrombosis	-	-	-	-	-	+	-	-	+	+
Splenectomy	-	+	-	+	-	-	-	-	+	-
Antiviral therapy	+	+	-	+	+	-	+	-	+	+
ESI/time	1	6	3	1	3	2	1	2	2	5
Balloon/time	4	3	1	0	3	1	4	1	0	0
Degree of stricture	II	III	IV	II	II	III	III	IV	III	III
Direction of scar /o'clock	3	2	10	12	3	11	3	10	9	1
Distance to incisor /centimeter	38	37	34	38	36	39	35	39	36	38
Thick of scar /millimeter	1.1	3.6	3.2	2.5	1.7	1.9	2.7	3.9	3.1	1.9
Relief of stricture	+	+	+	+	+	+	+	-	+	+

F:female; M:male; -:Negative; +:positive;HEB:hepatitis B; ALC:alcohol; HCC:hepatocellular carcinoma; ESI:endoscopic injection sclerotherapy;

Efficacy: The dysphagia was obviously relieved in 9 patients during follow-up among three months to six months. 1 patient suffered dysphagia again within one month after the treatment, and endoscope found that the degree of stricture was grade III. There was no complication of perforation, bleeding and infection among the patients.

Discussion

Esophageal stricture is one of the complications after ESI, and the incidence of stricture is among 2% and 10% [7]. However, it seriously affects the quality of life to the patient. The reasons of esophageal stricture after ESI are as follow [1, 2, 8]: Vascular endothelial is injured, chronic inflammation and fibrous scars gradually formed after the sclerosant injected into varices. Barrier of esophageal mucosa is damaged. The muscularis mucosa and propria of esophagus may injure, which would directly lead to scar stricture. The injection is near the physiological stricture of the esophagus. The dose of sclerosant is large. The sclerosant is intensively injected at the same level of the esophagus, then amount of fibrous scars are formed on the same circumference of the esophagus. Repeatedly injections of sclerosant induce the scar tissue overlapped, and interlaced.

The endoscopic treatment for benign esophageal stricture includes balloon dilation, local incision, and stent placement. Balloon dilatation mainly achieves the effect by the mechanical tension of the balloon, on the other side, it will tear the normal mucosa and/or muscularis around esophagus [9]. Local incision esophageal stricture is reliable [10-11], which will significantly relieve the dysphagia in patients. However, there should be alert to the complication of perforation, when the muscularis propria of esophagus are cut. Stent placement will extend the esophageal stricture, however, complications are much more, such as chest pain, reflux esophagitis, displacement or detachment, and tissue embedded stents [12-13].

Ultrasound endoscopy can clearly show the five layers of the normal esophagus. [14] When the scar of esophageal inflammatory stricture was detected through ultrasound endoscopy, it showed that the tissue of scar was more thicker than normal mucosa, and the location and depth of scar could be measured exactly. [15]

The particularity of esophageal stricture after ESI for esophageal varices is that most patients are accompanied by risk factors such as residual varices, coagulation dysfunction, low immunity [16]. The data of 10 patients with esophageal stricture after ESI in our hospital treated by cutting the scar through ultrasound endoscopy were retrospective in this article. The dysphagia of stricture were obviously relieved in 9 patients during follow-up among three months to six months, and 1 patient suffered dysphagia again within one month after the treatment. There was no complication of perforation, bleeding and infection among the patients. The advantage of ultrasound endoscopy guiding to cut scar were

as follow: □ It kept away from residual varices, which avoided the bleeding from varices. □ The scar were cut according the depth measured by ultrasoic endoscopy, which would reduce the complication of perforation. □ The normal mucosa would not be tear as balloon dilatation.

Conclusion

Ultrasoic endoscopy guiding to cut scar was safe and reliable ,which could reduce the occurrence of perforation and bleeding. This study has several limitations mainly related to its retrospective design. More cases and much more longer follow-up time are needed to evaluate the efficacy of ultrasoic endoscopy guiding to cut scar in the treatment of esophageal stricture complicated by ESI.

Abbreviations

ESI: esophageal varices sclerotherapy injection;

HCC: hepatocellular carcinoma;

HEB: hepatitis B;

ALC: alcohol;

Declarations

Ethics approval and consent to participate

The study protocol conformed to the ethical guidelines of the Declaration of Helsinki and was approved by the ethics review committee of HangZhou XiXi Hospital. Written informed consent was obtained from the patient and from all individual participants included in the study. Neither the transplant donor nor the recipient was from a vulnerable population.

Consent for publication

Written informed consent was obtained from the patient for publication of these cases and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Availability of data and materials

All data generated or analysed during this study are included in this published article [and its supplementary information files].

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

YD Z conceptualized and designed the study.

JX, YS, BW, HW and CJ H performed the data collection. FL Z analyzed and interpreted the data. FL Z and JX drafted and critically revised the manuscript. All authors read and approved the final manuscript.

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Figures



Figure 1

The esophageal stricture was obvious after ESI.

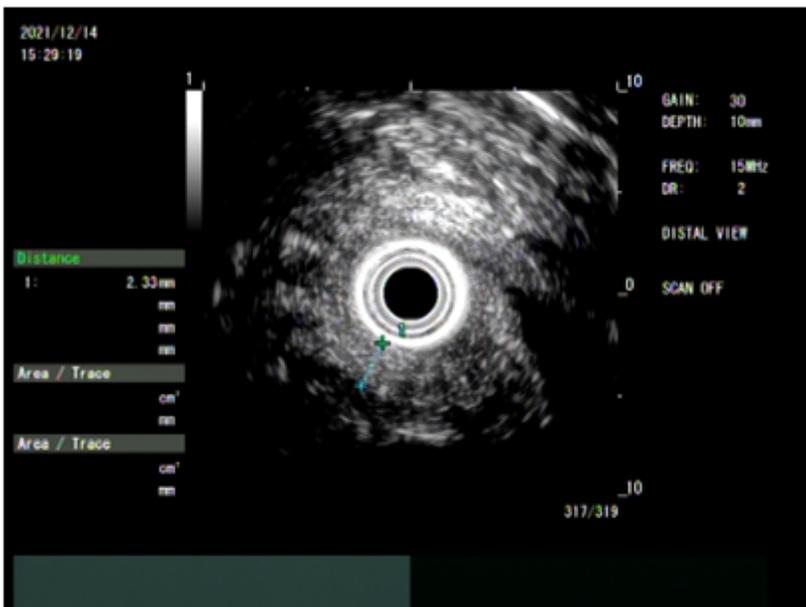


Figure 2

Microprobe of ultrasonic endoscope scanned the scar of esophageal stricture.



Figure 3

The scar was cut with dualknife according to the measurement by ultrasonic endoscopy.

Supplementary Files

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- [Datesofthetencases.xls](#)