Chapter 29
Endoscopic Treatment of Esophageal Varices: Simultaneous Combination of Endoscopic Injection Sclerotherapy and Endoscopic Variceal Ligation

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Abstract In combined therapy with endoscopic injection sclerotherapy and endoscopic variceal ligation (EISL), the two procedures are performed simultaneously. At our hospital, EISL is performed as the first-line treatment for elective and prophylactic cases of esophageal varices. In this chapter, we introduce the EISL technique and clinical results.

Keywords Endoscopic treatment · Esophageal varices · EISL · EVL · EIS

29.1 Introduction

In combined therapy with endoscopic injection sclerotherapy (EIS) and endoscopic variceal ligation (EVL) (EISL), the two procedures are performed simultaneously. EISL targets esophageal varices and was first reported by Nishikawa et al. [1] in 1995. EISL can be easily performed and is an effective treatment that involves EIS via intravascular injection of ethanolamine oleate (EO) and EVL via ligation of the puncture site. It is currently widely used in medical facilities [2–5]. At our hospital, EISL is performed as the first-line treatment method for elective and prophylactic cases of esophageal varices. In this chapter, we introduce the EISL technique and its procedures, focusing on treatment performance.

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29.2 EISL Procedure

Technique of EISL is introduced for elective and prophylactic cases of esophageal varices.

29.2.1 Instruments and Drugs Used

The instruments and drugs used are as follows:

- Pneumo-activated EVL device with cuff attachment (Sumitomo Bakelite Co. Tokyo, Japan)
- 23- or 25-G esophageal varix puncture needle (adjustable protrusion length type)
- Overtube
- 10% EO, contrast agent (1:1 solution of 5% EO)
- Dry sodium alginate powder
- Thrombin solution
- Alto Shooter
- Mouthpiece affixable with rubber band
- 20- and 2.5-mL injection syringe (Fig. 29.1)

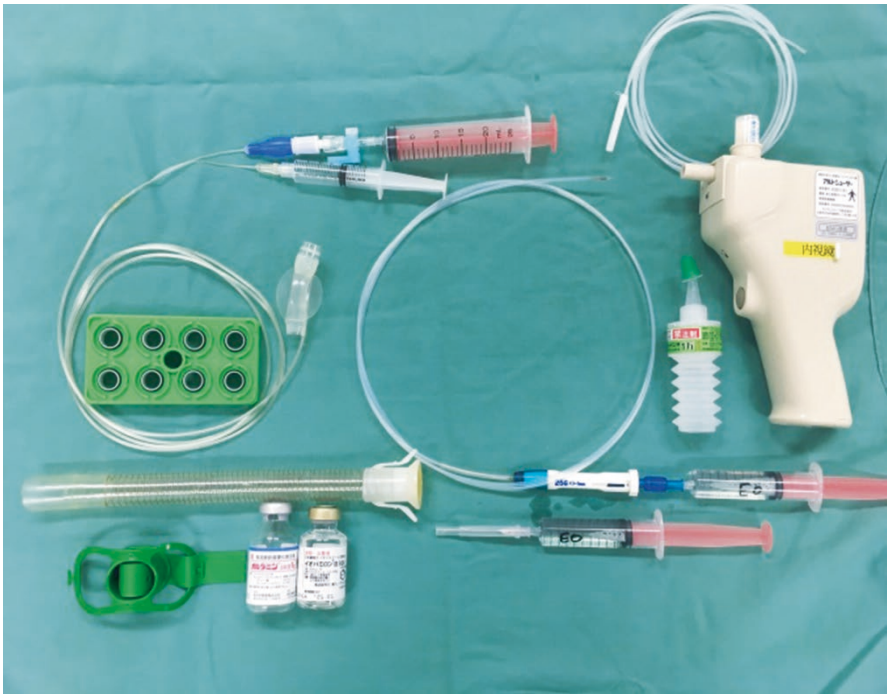

Fig. 29.1 Instruments and drugs used for EISL

29.2.2 Procedure

29.2.2.1 Pretreatment

To safeguard blood vessels, administer scopolamine butylbromide 20 mg or glucagon 1 mg intramuscularly to suppress peristalsis immediately prior to administering pentazocine 15 mg and hydroxyzine pamoate 25 mg via intramuscular injection.

In addition, while monitoring the patient, intravenously inject midazolam 2–5 mg and oxygen 2 L/min intranasally. Place the overtube beforehand to the scope and insert the scope.

29.2.2.2 Endoscopic Observations

Assess an appropriate puncture site based on endoscopic observations of the esophageal varices.

29.2.2.3 EISL Technique

Install the pneumo-activated EVL with a cuff to the scope (Figs. 29.2 and 29.3). Target the varix at the esophagogastric junction and position the biopsy channel of the scope toward the same direction as the target varix (7–8 o'clock angle).

29.2.2.4 EIS

Inflate the cuff with 15–20 cc of air and perform EIS. By using a 23- or 25-G puncture needle, adjust the protrusion length of the needle while considering the thickness and depth of the varices. Apply intermittent negative pressure to the syringe filled with EO with contrast medium (5% EO), and check for backflow of blood.

As the esophagus moves due to breathing, heartbeat, and peristaltic movements, it is important to keep the needle tip in the varices during EIS.

After confirmation of the puncture, slowly inject EO with contrast medium (5% EO) under fluoroscopy and into the left gastric vein that is a blood supply route for the varices. The maximum dose of 5% EO to be injected should be limited to 0.4 mL/kg per treatment session.

29.2.2.5 EVL

EVL is performed including at the puncture site, and the injection needle is removed.

After confirming the ligation site, remove the scope and install an O-ring again, and repeat the procedure for another varix. Lastly, apply thrombin and dry sodium alginate powder to the lower region of the esophagus. After this step, the first treatment is completed (Fig. 29.4).

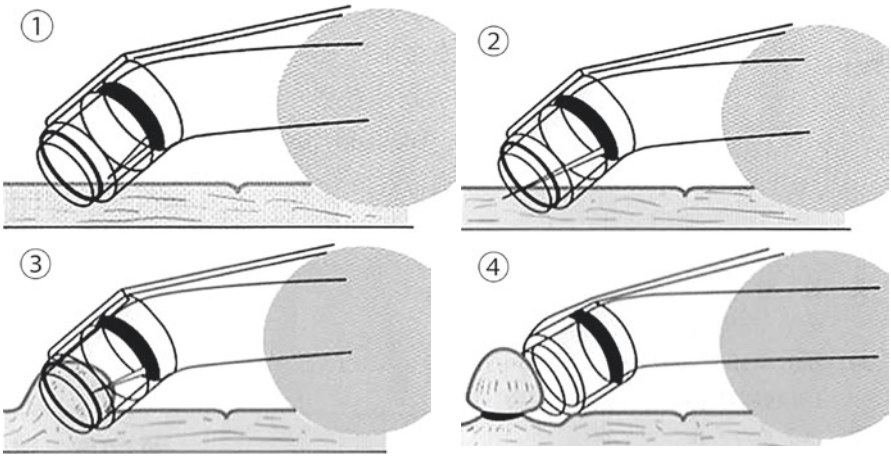

Fig. 29.2 Schematic diagram of EISL. Partially edited from Shigemitsu et al. [2]

Fig. 29.3 Installation of the pneumo-activated EVL device with an endoscopically installed cuff

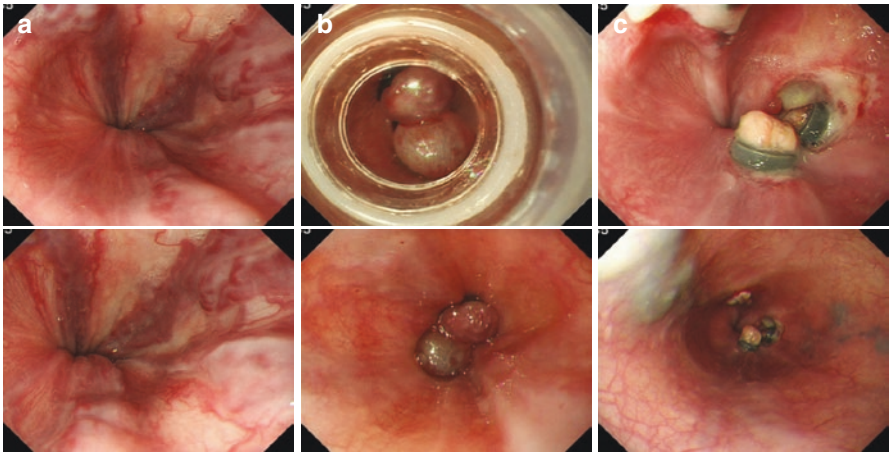

Fig. 29.4 Endoscopic images before and after EISL. (**a**) Before EISL, red color sign is observed. (**b**) Just after EISL. (**c**) One week after EISL, varices are thrombosed

29.3 Results and Complications

With regard to the recent cases involving esophageal varices treated by the authors, 103 were elective or prophylactic cases (elective, 35 cases; prophylactic, 68 cases). The average number of treatment sessions performed per case was 1.4 times, and the mean treatment time was approximately 15 min. Severe complication observed included perforation of the esophagus by the overtube (one case [1%], resolved through maintenance therapy). For cumulative recurrence rates, the 1-year recurrence rate was 12% and the 3-year recurrence rate was 27%.

For the recurrent cases after EISL, EISL was performed again followed by mucosal fibrosing using argon plasma coagulation (APC) to prevent further recurrence.

Nishikawa et al. [1] reported that EISL is effective because of interruption of blood flow and the absence of bleeding after removal of the needle.

Shigemitsu et al. [2] reported in the prospective randomized study that EISL is more useful for esophageal varices than EIS alone, and the cumulative relapse rate for 2 years was 18.5% for the EISL group.

29.4 Advantages of EISL

In comparison with EIS, the advantages of EISL include the following:

- Fewer treatment sessions
- Smaller amount of EO used
- Less time required for each treatment

29.5 Conclusion

EISL is a safe and useful treatment for esophageal varices.

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