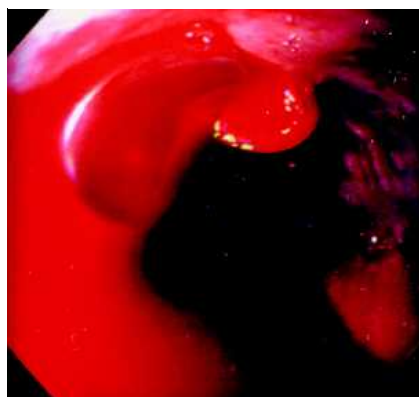


## Exuberant mucosal granulation by a self-expanding metal stent leading to complete closure of esophageal perforation

A 65-year-old man was hospitalized for massive hematemesis due to esophageal varices secondary to liver cirrhosis. Urgent upper endoscopy revealed esophageal varices, which were spurting blood, in the mid esophagus (● Fig. 1). An endoscopic injection sclerotherapy (EIS) was carried out, using 5% ethanol-amine oleate under X-ray guidance. The patient underwent three sessions of EIS, at weekly intervals. On the 6th day after the final session, the patient complained of anterior chest pain and a high fever. A chest X-ray examination revealed a right pleural effusion (● Fig. 2). Urgent upper endoscopy revealed an esophageal perforation directly into the right pleural space (● Fig. 3). No perforation into the mediastinum was observed.

Although percutaneous drainage of the pleural space was carried out continuously for 37 days, the fistula did not close. An attempt was then made to close this perforation with hemoclips, but it proved to be unsuccessful because of mucosal fibrosis after the EIS. Moreover, surgery was not indicated because the clinical stage of liver cirrhosis was Child grade B. On the basis of previous reports [1–3], a self-expanding metal stent (SEMS) was selected to seal the esophageal perforation (● Fig. 4). At 25 days after the stent placement, massive mucosal granulation was observed to have dramatically occurred from the mid esophagus around the fistula, and the perforation had therefore completely closed (● Fig. 5). The SEMS had also passed into the patient's stomach by this time (● Fig. 6). It was safely removed with the assistance of an overtube.

These results suggest that the moderate pressure from the SEMS and the appropriate oral nutrition intake might have induced a synergistic effect to promote the development of massive mucosal granulation around the fistula. In conclusion, the application of a SEMS may therefore be an effective treatment modality to close benign esophageal perforations without stricture.



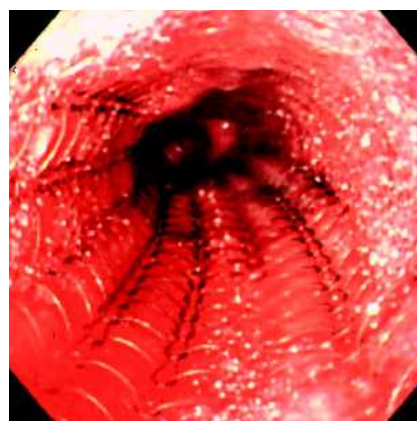
**Fig. 1** Endoscopic view of spurting bleeding from esophageal varices in the mid esophagus.



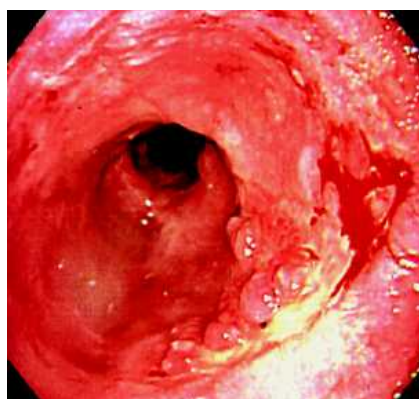
**Fig. 2** Chest X-ray showed a pleural effusion in the right pleural space.



**Fig. 3** The esophageal perforation into the right pleural space.



**Fig. 4** A self-expanding metal stent (SEMS) was positioned and deployed in the mid esophagus.



**Fig. 5** Healthy exuberant mucosal granulation tissue at the previous fistula site.



**Fig. 6** The SEMS passed naturally into the stomach and was removed using an overtube.

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## Bibliography

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