

The writing on the wall: self-expandable stents for endoscopic ultrasound-guided hepaticogastrostomy?

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See “Covered self-expandable metallic stents versus plastic stents for endoscopic ultrasound-guided hepaticogastrostomy in patients with malignant biliary obstruction” by Taro Shibuki, Kei Okumura, Masanari Sekine, et al., Clin Endosc 2023;56:802–811.

Malignant biliary obstruction is commonly caused by conditions such as pancreatic cancer, cholangiocarcinoma, or metastatic tumors compressing the bile ducts.¹ Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) is a minimally invasive procedure that establishes a drainage pathway between the bile duct and the stomach to bypass the obstruction.² EUS-HGS offers an alternative approach for managing biliary obstruction when other conventional methods, such as endoscopic retrograde cholangiopancreatography or percutaneous transhepatic biliary drainage, are not feasible or have failed. Covered self-expandable metallic stents (SEMS) and plastic stents (PS) are the two main types used in EUS-HGS.³ Covered SEMS are made of metal with a thin covering (usually silicone or polyurethane) that prevents tissue and tumor ingrowth and reduces the risk of stent occlusion. They offer a covering that reduces the risk of bile leaks and a larger caliber that provides good drainage and reduces the risk of stent occlusion. Covered SEMS are considered to have longer patency than PS, leading

to longer intervals between stent changes. The placement of covered SEMS requires specialized equipment and expertise, as well as a higher cost than PS. PS are made of polyethylene or polyurethane and are more flexible. They are generally less expensive than covered SEMS but have shorter patency than covered SEMS, necessitating more frequent stent changes.

The comparison between covered SEMS and PS for EUS-HGS in patients with malignant biliary obstruction is an important topic in interventional endoscopy and gastroenterology. The 2018 Japanese clinical practice guideline for EUS-guided biliary drainage recommends covered SEMS as the first choice; however, PS can be used for patients when there is difficulty with the application of covered SEMS.³ However, there are limited retrospective and no direct head-to-head randomized controlled trials comparing covered SEMS to PS for EUS-HGS in patients with unresectable malignancies. Given the relatively specific nature of this procedure and the underlying patient population, conducting randomized trials is challenging in terms of patient selection and recruitment. It is essential to consider other sources of evidence, such as case series, retrospective studies, and expert opinions, when evaluating the advantages and disadvantages of covered SEMS versus PS for EUS-HGS.

In a study by Shibuki et al.,⁴ a multicenter retrospective comparative analysis was conducted, including 109 and 43 patients with unresectable malignancies palliated with covered SEMS and PS for EUS-HGS, respectively. The study aimed to evalu-

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ate several key outcome measures, including time to recurrent biliary obstruction (TRBO), complications, and re-intervention rates. The authors demonstrated that the covered SEMS group had a significantly longer TRBO than the PS group (646 vs. 202 days, $p=0.045$). However, there were no significant differences between the two groups regarding complication rate, technical success rate, overall survival, or re-interventional technical success rate. In addition, patients who received covered SEMS placement and underwent EUS-guided antegrade stenting had a more extended period before experiencing recurrent biliary obstruction compared to other factors such as age, sex, Eastern Cooperative Oncology Group performance status, diagnosis, site of biliary obstruction, prior transpapillary drainage, indication of the procedure, and punctured bile duct.

There were several limitations to the current study, including its non-randomized retrospective design, the use of different placement techniques, and the utilization of various stent types. This study failed to analyze the impact of concomitant chemotherapy and radiation therapy on patient outcomes. Nevertheless, the study findings support the expert opinion that covered SEMS are preferred over PS in EUS-HGS. Using covered SEMS for EUS-HGS has some theoretical disadvantages, including the potential for blocking intrahepatic bile duct branches, stent migration, and granulation with stricture formation in the intrahepatic ducts (proximal end of the stent), and higher cost.⁵ However, it should be remembered that bile leak is the primary reason for using covered SEMS in EUS-HGS compared to PS.

Ongoing efforts are required to develop novel stents for EUS-HGS to address the limitations and challenges associated with the current options. Umeda et al.⁶ introduced a single PS with a tapered tip and four flanges to prevent migration and reduce the risk of blockage in intrahepatic ducts. A dedicated partially covered SEMS has also been designed with an uncovered section for the intrahepatic ducts to prevent blockage of smaller branches, along with an antimigration design.⁷ More recently, a newly developed partially covered SEMS with a spring-like anchoring function on the gastric side has been introduced.⁸ New stent designs should aim to reduce the risk of stent occlusion or migration, thereby maintaining patency and reducing the need for frequent stent replacements. Improved stent designs should also offer better flexibility and ease of deployment, making the procedure smoother and reducing the risk of technical difficulties during stent placement.

Conflicts of Interest

Hyung Ku Chon is currently serving as a Korean Society of Gastrointestinal Endoscopy Publication Committee member; however, he was not involved in the peer reviewer selection, evaluation, or decision processes for this study. Shayan Irani is a consultant for Boston Scientific and Gore. Tae Hyeon Kim has no potential conflicts of interest.

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