



Could the “SpyGlass Direct Visualization” System Open New Horizons for Treating Biliary Tract Diseases as a Percutaneous Cholangioscopy?

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See “Efficacy and Safety of Percutaneous Transhepatic Cholangioscopy with the Spy-glass DS Direct Visualization System in Patients with Surgically Altered Anatomy: A Pilot Study” by Hyung Ku Chon, et al. on page 111, Vol. 16, No. 1, 2022

Endoscopic retrograde cholangiopancreatography (ERCP) has a pivotal role for the management of biliary tract diseases though the diagnostic role has been gradually replaced by noninvasive imaging modalities such as magnetic resonance cholangiopancreatography and endoscopic ultrasonography. Despite the technical improvement of these imaging modalities, they have some limitations for detailed evaluations of the bile duct epithelium. Thereby, for the purpose of direct visualization of the bile duct, cholangioscopy has been developed, and it used to be performed via percutaneous transhepatic approach after sufficient fistula tract dilation during percutaneous transhepatic cholangiography (PTCS). Recently, with the advance of miniaturizing technology it has become possible to take the cholangioscopy via a peroral route, referred to as “peroral cholangioscopy (POC).” This can be approached by two different strategies; direct intubation into the bile duct with an ultra-thin endoscope, which is referred to as direct POC and indirect intubation into the bile duct via the working channel of a duodenoscope with using a small-caliber cholangioscope, which is referred to as “mother-baby” endoscope system, or with a disposable access catheter equipped with optical probe, which is referred to as “SpyGlass direct visualization” system.¹

The main indications for POCs are through-the-scope therapy with electrohydraulic or laser lithotripsy for difficult biliary stones, and more detailed examination with direct visualizing and targeted sampling for indeterminate biliary strictures.² Moreover, selective guidewire placement into target lesions of biliary strictures can be facilitated un-

der the visual guidance of POC, and it may also be useful for evaluating the tumor extent and targeting the proper lesions of ablation therapy, and for evaluating effectiveness, remnant intraductal tumor, or recurrence after ablation therapy.³⁻⁵

In general, SpyGlass system has been used for performing POCs. However, in this issue of Gut and Liver, the pivot study by Chon *et al.*⁶ showed that SpyGlass system could be safely utilized for the purpose of PTCS in patients with surgically altered anatomy although the number of enrolled patients was only five with a biliary stricture and eight with bile duct stones. Furthermore, the efficacy for indeterminate biliary stricture and bile duct stones management was also reported; SpyGlass-guided target biopsy for biliary strictures showed 100% accuracy for adenocarcinoma and bile duct stones could be removed in all cases. When it comes to complications, no procedure-related morbidity or mortality was reported in this pivot study. This safety profile of SpyGlass system as a PTCS was also identified by Du *et al.*⁷ for biliary strictures in four patients and by Tripathi *et al.*⁸ for bile duct stones in four patients and biliary strictures in one patient. Of course, these studies have several drawbacks that it was retrospectively conducted, and the enrolled number of patients were very small. However, these studies show the expandability of SpyGlass DS as a powerful diagnostic and therapeutic armamentarium for the patients with surgically altered anatomy as a PTCS, particularly for the patients with long limbs of Roux-en-Y anastomosis which hampers successful performance of conventional ERCP. Draganov *et al.*⁹ also



demonstrated that SpyGlass-guided bile duct stones clearance were successful in 24 patients (92.3%) and SpyGlass-targeted biopsies were feasible in 43 cases (97.7%). Furthermore, in terms of indeterminate stricture, the quality of biopsy samples was sufficient for evaluation although it was applied as an ERCP-guided peroral cholangiography.⁹

The SpyGlass system has several advantages. First, it is allowed to control both duodenoscope and SpyScope by a single endoscopist at the same time, whereas the “mother-baby” system requires two specialized endoscopists to maneuver one duodenoscope and the other cholangioscope, respectively, thus this SpyGlass system is referred to as single-operator distal cholangioscope. Second, the SpyScope has smaller outer diameter of 10.5 F, thereby enabling to perform PTCS with a lesser degree tract dilation; however, for conventional PTCS, fistula tract dilation is required up to 16–18 F because the diameter of a percutaneous cholangioscope is 4.1–4.9 mm.¹⁰ Third, it can be handled with 4-way tip deflection and has a separate irrigation channel aside from the working channel, thus permitting sustained water irrigation. Finally, since the catheter equipped with optical probe is fully disposable, it can be easily replaced with a new one when it must be repaired. In 2018, the new distal version of SpyGlass DS was released and had many advancements compared to original version introduced in 2006; 4 times greater resolution, wider 110° field of view, and completely disposable SpyScope DS catheter that is composed of optic probe and delivery catheter within one unified body.¹

Despite these advantages, it has not gained widespread use, except a few large volume centers with particular expertise in pancreatobiliary endoscopy. The main limitation of SpyGlass DS is the high cost of operating this system because of the lack of a dedicated reimbursement. However, this problem in South Korea has been partially resolved by new legislation for the inclusion of SpyGlass as a therapeutic material covered by national health insurance, and it has become effective just a few months ago in July 2021. Therefore, I wonder whether the SpyGlass system could bring new horizons for treating biliary diseases especially for the patients with surgically altered anatomy as alike as those achieved by upper and lower endoscopy which have nearly replaced the radiologic X-ray evaluation with barium swallowing for the gastrointestinal tract.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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