Endoscopic stenting of dominant strictures in patients with primary sclerosing cholangitis: When, how, and for how long?

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Primary sclerosing cholangitis (PSC) is a progressive cholestatic disease associated with chronic inflammation and fibrosis of the intra-/extra-hepatic bile ducts [1]. Given the lack of adequate medical treatment, the current focus is on management of adverse events (AEs); efforts are made to relieve biliary obstruction [1, 2]. Dominant strictures (DSs) develop in up to 60 % of patients with PSC, associated with impeded biliary drainage that induces progression to cholangitis or liver failure. In such patients, endoscopic balloon dilatation (with or without stenting) is often used to relieve obstructions [3–5]. Although both methods afford laboratory-assessed and clinical improvements [6–9], treatment outcomes have varied (▶ **Table 1**).

In the retrospective work of Kaya et al. [4], the effects of endoscopic stenting after balloon dilatation and balloon dilatation alone were compared in 71 patients. Endoscopic stenting after balloon dilatation afforded no additional clinical benefit compared to dilatation alone, and the AE numbers were somewhat higher in patients who underwent endoscopic stenting. The recent randomized controlled trial of Ponsioen et al. [6] compared patient outcomes after endoscopic stenting with balloon dilatation, and balloon dilatation alone, in patients with PSC who had DSs. Patients receiving either treatment did not differ in terms of DS recurrence within 2 years; the cholangitis incidence was higher in the stenting group. Thus, balloon dilatation alone may adequately maintain patency; there seems no need for additional stent placement.

In this issue of Endoscopy International Open, Han et al. explore the possible clinical benefits afforded by endoscopic stenting after balloon dilatation when managing biliary decompression in selected patients with PSC who have DS. Patients who underwent endoscopic stenting after dilatation exhibited a significantly higher Mayo PSC Risk Score (1.80 ± 1.1 vs. 0.93 ± 1.2), more jaundice (24.4 % vs. 11.1 %), and more cholangitis (22.6 % vs. 1.9 %) than did patients who underwent balloon dilatation alone. Despite the differences in disease severity between the two groups, no significant differences in either transplantation-free survival (3.4 vs. 3.3 years) or clinical improvement (92.2 vs. 96.3 %) were apparent, suggesting that endoscopic stenting may, indeed, play a useful role in terms of DS management in selected patients with more severe disease.

The studies cited above, including the work discussed in this editorial, clearly show that an endoscopic stenting decision should be carefully weighed in terms of the potential benefits and drawbacks. The several disadvantages of endoscopic stenting are: (1) A risk of premature stent occlusion followed by cholangitis or sepsis; (2) the possible need for a second intervention (stent replacement or removal); and (3) a risk of impeded drainage from smaller or strictured intrahepatic ducts adjacent to the stent [6, 10]. Therefore, endoscopic stenting should be considered only for selected patients; the clinical benefits must outweigh the possible disadvantages. For instance, patients with high Mayo PSC scores (which predict an increased risk of death in patients with PSC), those with severe cholangi-

▶ **Table 1** Summary of studies exploring endoscopic treatment of dominant strictures in patients with primary sclerosing cholangitis.

Authors (year)	Patients, n	Study design	Intervention	Stent type	Duration	Study results
Balloon dilatation with/without stenting						
Gluck et al. [5] (2008)	84	Retrospective	Endoscopic stenting after balloon dilatation	Plastic stents (7–10F)	Less than 2 weeks (or even shorter, at the discretion of the endoscopist)	Higher transplantation-free survival rates at 3 and 4 years than suggested by the predictive Mayo model ($P = 0.021$); adverse events in 7.2 %
Gotthardt et al. [7] (2010)	96	Prospective	Balloon dilatation plus stenting (the latter only in five patients with severe cholestasis and cholangitis)	Plastic stents	1–2 weeks	Improvement in the mean bilirubin level of 56 %; adverse events in 3.8 %
Endoscopic stenting after balloon dilatation versus balloon dilatation alone						
Kaya et al. [4] (2001)	71	Retrospective	Endoscopic stenting after balloon dilatation in 37 patients (19 treated via a percutaneous approach); balloon dilatation alone in 34 patients	Plastic stents (7–10F)	Median duration 3–6 months	No difference in terms of cholestasis improvement; more adverse events ($P = 0.004$) in the stenting group; more cholangitis ($P = 0.001$) in the stenting group
Ponsioen et al. [6] (2018)	65	RCT	Endoscopic stenting after balloon dilatation in 31 patients; balloon dilatation alone in 34 patients	Plastic stents (10F)	Average 7 days (maximum 14 days)	No difference in recurrence-free rate ($P = 1.0$); More adverse events ($P = 0.01$) in the stenting group
Han et al. (2022)	169	Retrospective	Endoscopic stenting after balloon dilatation in 115 patients; balloon dilatation alone in 54 patients	Plastic stents (7, 8.5, 10F)	2 months (at the discretion of the endoscopist)	No difference in transplantation-free survival; no difference in terms of clinical improvement

RCT, randomized controlled trial.

tis, and patients who have cholestasis and/or cholestatic symptoms may be possible candidates for endoscopic stenting, although further validation is required.

Turning to the stent type, PSs of various diameters (7–10F) can be used to decompress DS; the use of fully covered self-expandable metal stents (FCSEMSs) is being investigated [11]. However, FCSEMS placement in patients with DS is difficult because: (1) such patients typically have narrow ducts that cannot accommodate FCSEMSs of diameters 8 to 10 mm; and (2) FCSEMSs are prone to stent-related strictures [12]. Thus, a PS should be the primary stent choice for patients with DS; FCSEMS use in patients with PSC should be limited to those with malignant disease [6].

Turning to the duration of stent placement, a stent is recommended to be removed from a DS patient after 1 to 2 weeks; the current European guidelines suggest that premature stent occlusion is problematic in patients with PSC [13]. Ponsioen et al. retrospectively studied 32 patients with PSC who had symptomatic DS; short-term endoscopic stenting (mean duration 11 days) was both safe and effective. Biochemical and cholestatic symptoms improved in 83 % of patients 8 weeks after the procedure and 70 % did not require any reintervention for 2 years [8]. Because no prospective study has yet evaluated stent placement duration, further studies are needed to determine the optimal duration that prevents premature occlusion and effectively resolves stricture issues.

Conclusions

In conclusion, endoscopic balloon dilatation should be the DS treatment of choice in patients with PSC, and endoscopic stenting can be a useful option in selected patients with advanced or refractory DS. PSs generally ensure successful biliary drainage; FCSEMSs should be placed (with caution) only when PSs fail in intractable cases. Short-term stent placement is recommended to avoid stent-related AEs. Further randomized controlled trials are needed to determine whether endoscopic stenting is useful in selected patients with advanced PSC and DSs.

Competing interests

The authors declare that they have no conflict of interest.

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