A novel approach in benign biliary stricture – balloon dilation combined with cholangioscopy-guided steroid injection

Fig. 1 Benign biliary stricture with sharp angulation of the axis and bile duct stones in a 58-year-old male patient who received an orthotopic liver transplant.

Fig. 2 Spyglass cholangioscopy. **a** Direct view of the benign biliary stricture. **b** Cholangioscopy-guided steroid injection.

The first-line endoscopic strategy for the treatment of benign biliary stricture (BBS) consists of balloon dilation combined with the placement of multiple plastic stents, which has a success rate of more than 80%. Nevertheless, stricture may recur in 10% to 30% of cases after initial resolution [1,2]. Cholangioscopy is a useful adjunct to endoscopic retrograde cholangiopancreatography (ERCP) for the evaluation and treatment of refractory BBS [3,4].

A 58-year-old male patient with BBS after receiving an orthotopic liver transplant was treated with dilation and progressive stent placement, but the response after five ERCP procedures was poor. Cholangiography showed a stricture 3 mm in diameter with a sharp and angulated axis and multiple stones proximally (► **Fig. 1**). Therefore, the patient was treated with a novel technique in which a single-operator direct visualization system (SpyGlass DS Direct Visualization System; Boston Scientific, Natick, Massachusetts, USA) was used.

Initially, balloon dilation of the stricture up to 10 mm was performed, and stones were partially removed. After it had been accurately positioned at the level of the stricture, a prototype 26-gauge sclerotherapy needle (Montag, São Paulo, SP, Brazil) was introduced through the SpyGlass working channel, and 4 mL (40 mg) of triamcino-

Fig. 3 Fluoroscopic view of balloon dilation of the refractory benign biliary stricture. **a** Waist of the stricture. **b** Expansion of the waist with 13.5-mm balloon dilation.

Fig. 4 Magnetic resonance cholangiopancreatography demonstrates a satisfactory diameter of the anastomosis without leaks or stones in the common bile duct.

Video 1

SpyGlass cholangioscopy-guided steroid injection at a benign biliary stricture.

lone acetate (Apsen Farmaceutica, São Paulo, SP, Brazil) was injected circumferentially (► Fig. 2). The procedure was technically and clinically successful, with no intra-procedural adverse events. In a second procedure 1 week later, extreme balloon dilation (up to 13.5 mm) of the anastomosis [5] was performed (► Fig. 3), and the bile duct was cleared with an extractor balloon. Cholangioscopy showed moderate laceration of the anastomosis, and a second session of steroid injection was conducted. No stents were placed. The patient had a good recovery with no ad-

verse events. Control magnetic resonance cholangiopancreatography (MRCP) demonstrated a biliary anastomosis with a caliber of 4.5 mm and no leaks or stones in the common bile duct (► Fig. 4, ► Video 1). In summary, the patient underwent two sessions of cholangioscopy-guided steroid injection immediately after biliary balloon dilation, with 40 mg of triamcinolone acetate injected per session. To our knowledge, this is the first report of a BBS treated by extreme balloon dilation combined with cholangioscopy-guided steroid injection. The safety and feasibility of this procedure have been demonstrated. The technique has the potential to become a standard treatment for refractory BBS.

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