Minimally invasive treatment of intrahepatic cholangiolithiasis after stricture of hepaticojejunal anastomosis

Aliaksandr Varabei[1], Yury Arlouski[1], Natalli Lagodich[1], Vitaly Arehay[2]

[1]Belarusian Medical Academy of Post-Graduate Education, Minsk, Belarus
[2]N.N. Alexandrov National Cancer Centre of Belarus, Minsk, Belarus

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Abstract

The aim of the study was to improve the results of treatment of patients with intrahepatic cholangiolithiasis for hepaticojejunostomy stricture with use of miniinvasive methods. In our centre during the period from 2002 till 2016 were treated in 58 patients with hepaticojejunostomy strictures. Thirteen patients from their was coexistant intrahepatic cholangiolithiasis. Forty-six (79.3%) patients was performed rehepaticojejunostomy. Twelve patients was performed a minimally invasive intervention such as laser recanalisation using double balloon enteroscopy (7 patients) and lithoextraction with double balloon enteroscopy (1), transhepatic cholangioscopy (2 patients) with laser lithotripsy (1), balloon dilatation of the stricture rehepaticojejunostomosis (4), lithoextraction (4), including with double balloon enteroscopy ("randevoux" procedure) (1), stenting (2). We observed several complication such as cholangitis (5); recurrent cholangiolithiasis (1); restricture of rehepaticojejunostomosis (2). Miniinvasive endoscopic techniques treatment and endobiliary correction of rehepaticojejunostomosis strictures and cholangiolithiasis have shown good results.

Key words: *stricture, hepaticojejunoanastomosis, double balloon enteroscopy, lithotripsy, cholangiolithiasis.*

Introduction

Benign strictures of hepaticojejunal anastomoses (HJA) are observed in 10–30% of cases after reconstructive operations on the bile ducts [1, 2]. However, from 62.3% to 75% of such patients are reported to be subjected to repeated operations for recurrent anastomotic strictures [3, 4].

Quite often this pathology may be complicated by recurrent cholangitis, cholangiolithiasis, hepatic failure and liver cirrhosis [5, 6]. According to Negi *et al.*, liver cirrhosis resulting from biliary obstruction can develop within 3.8–14.8 months of the postoperative period [7].

Traditionally, repeated reconstructive surgery for strictures of HJA and cholangiolithiasis is associated with traumatic interventions decreasing the quality of patients' lives and increasing the risk of their developing recurrent stricture formation [8]. According to Bismuth, in 60–90% of cases each subsequent operation leads to stricture level type IV–V [9, 10].

Case report

On December 12, 2016 a 70-year-old woman was admitted to our center with complaints of abdominal pain, jaundice, and fever. Previously, in 2014, she had been subjected to a pancreatoduodenal resection for ductal adenocarcinoma. Since February 2016 she had had clinical manifestations of cholangitis: periodic abdominal pain, temperature up to 38°C, and icteric skin. According to the data obtained through the magnetic resonance cholangiography in October 6, 2016, the patient's intrahepatic ducts

Address for correspondence
Prof. Aliaksandr Varabei, Belarusian Medical Academy of Post-Graduate Education, Lesnoe 1, Minsk District, 223041 Minsk, Belarus, phone: +37 5296554717, e-mail: dept-surg@hotmail.com

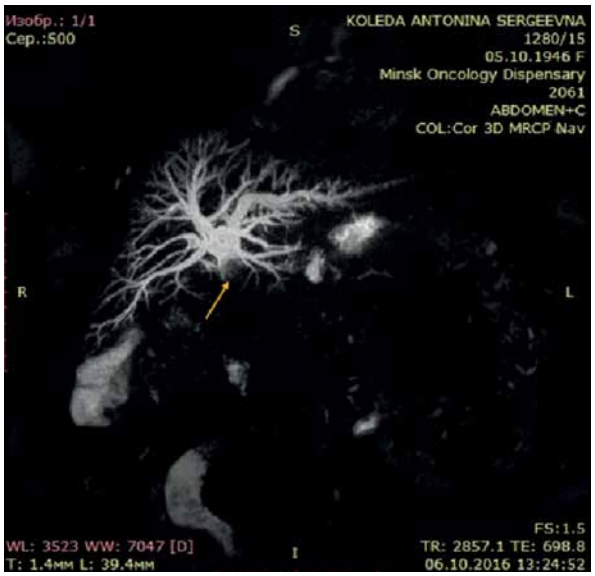

Photo 1. Magnetic resonance cholangiography: a concrement in the hepatic duct above the HJA (note the arrow)

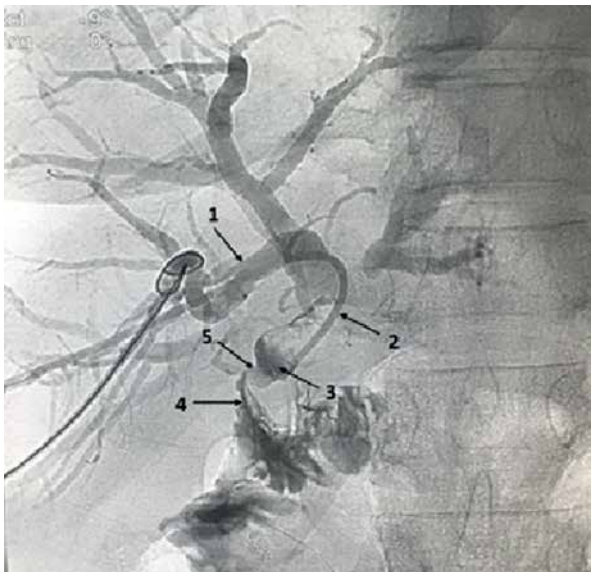

Photo 2. Percutaneous transhepatic cholangiography: 1 – right hepatic duct, 2 – catheter with a conductor, 3 – concrement, 4 – Roux-en-Y jejunum loop, 5 – stricture of HJA

were enlarged. She had a common hepatic duct (CHD) length of 21 mm with an oval-shaped intraluminal filling defect of 21 × 9 mm, while the distal common bile duct was not visualized (Photo 1).

In December 22, 2016 the patient was subjected to a combined minimally invasive treatment with simultaneous double-balloon enteroscopy (DBE) of the Roux-en-Y loop under the guidance of percutaneous transhepatic cholangiography (PTCG). The procedure was as follows.

The right intrahepatic bile duct was punctured in the right 7th intercostal space in the mid-axillary line. The cholangiography revealed a filling defect in the lobar hepatic ducts, confluence and CHD (20 × 15 mm). The contrast agent was instilled into the small bowel through the stenotic HJA (Photo 2).

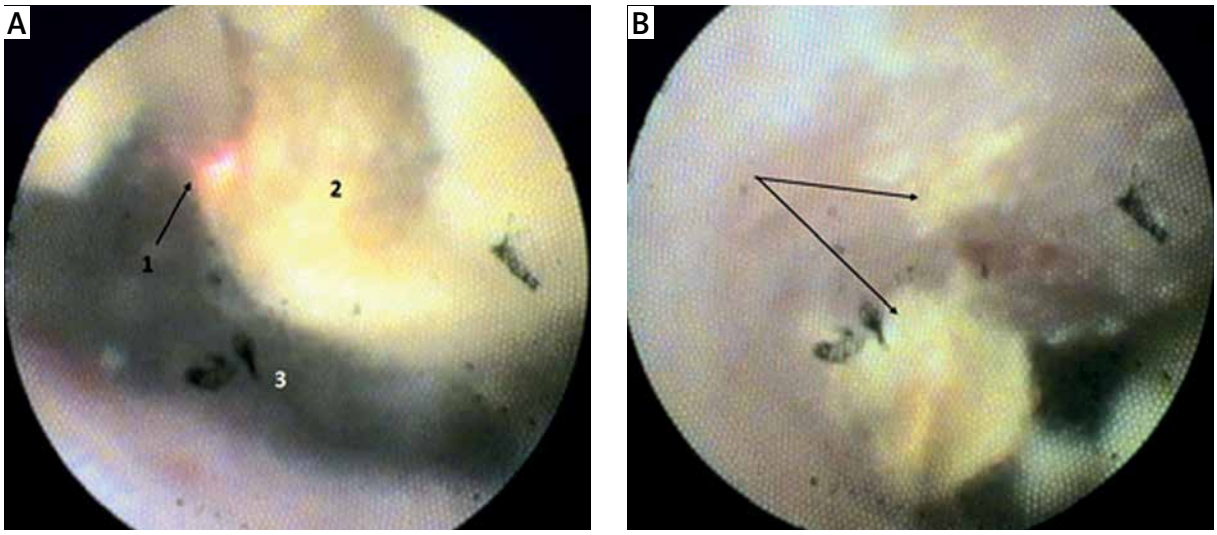

Photo 3. Percutaneous transhepatic cholangioscopy: **A** – direct visualization of a concrement in CHD and its laser lithotripsy (1 – laser light guide, 2 – concrement, 3 – the lumen of CHD); **B** – the result of lithotripsy (arrows indicate concrement fragments)

We performed the recanalization of the HJA using a conductor and a catheter. A 10 Fr introducer was inserted into the lumen of the bile ducts, through which the lumen became accessible by a cholangioscope. A dense concrement obturating the duct lumen and the zone of anastomosis was visualized in the area of the confluence and the HJA (Photo 3 A). This manipulation allowed for laser lithotripsy of the concrement (wavelength of 1440 nm, power of 12 W) (Photo 3 B).

The lithotripsy through the conductor was followed by balloon dilatation of the HJA with subsequent transportation of the stones below the anastomosis into the jejunum (Photo 4).

After the double-balloon-enteroscope (DBE) was retrieved to the anastomosis zone, the concrement obturating the lumen was removed with a Dormia basket inserted through the working channel of the DBE (Photo 5).

Discussion

Recently, there has been observed a tendency to frequently use minimally invasive methods for the diagnosis and treatment of cholangiolithiasis and strictures of HJA: percutaneous transhepatic biliary drainage, PTCG with balloon dilatation of the anastomosis, lithotripsy with lithoextraction using DBE, and stenting [11–13]. According to Mueller *et al.*, the efficacy of percutaneous transhepatic interventions for strictures of HJA ranges from 67% to 73% [14]. However, when used separately, these methods are not always effective. There are also technical diffi-

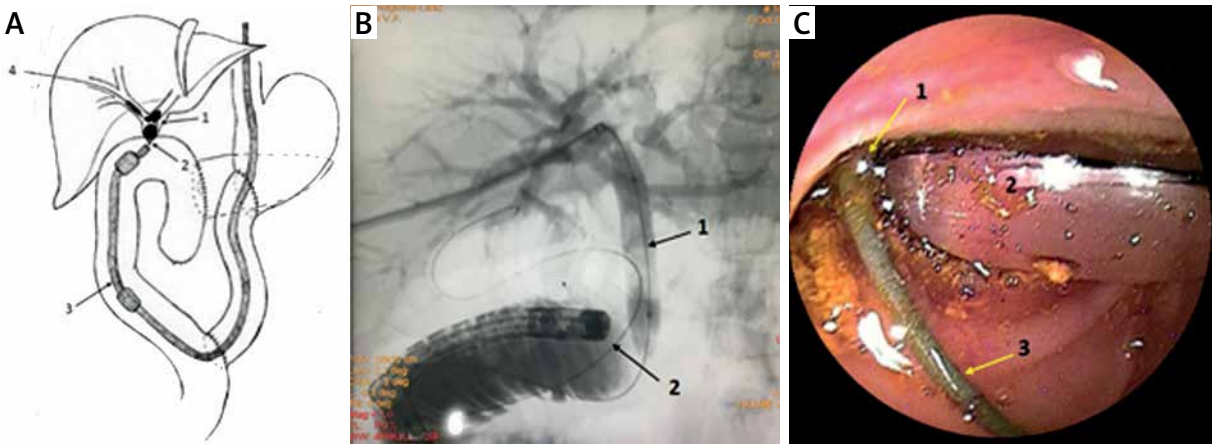

Photo 4. Balloon dilatation of HJA: **A** – scheme of procedure (1 – zone of HJA, 2 – balloon dilatator), **B** – PTCG after dilatation: a visible enlarged zone of HJA (note the arrow) and free entry of the contrast agent into the jejunum loop (1), **C** – endoscopic photo: 1 – hepaticojunoanastomosis, 2 – balloon, 3 – conductor

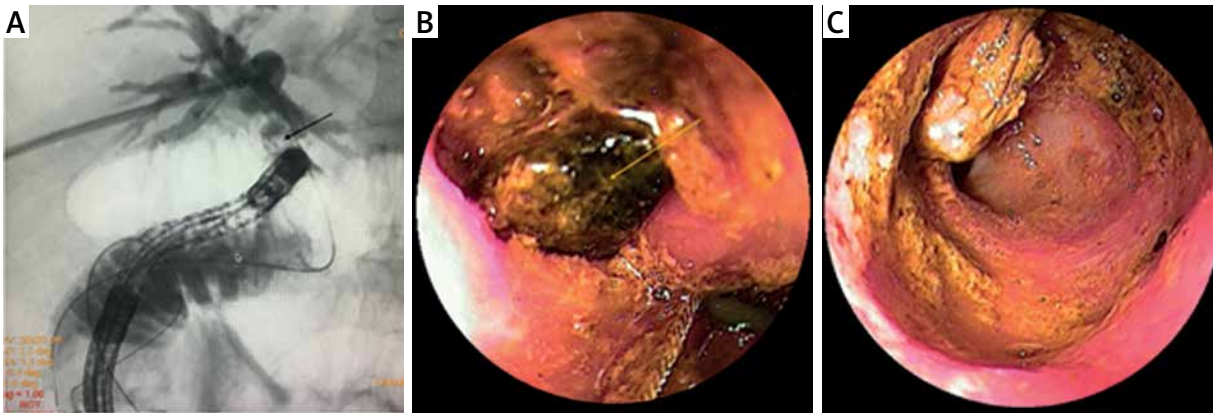

Photo 5. A – Percutaneous transhepatic cholangiography (the arrow shows a concrement above the HJA, **B** – endoscopic image (the arrow shows a large concrement in the lumen of HJA), **C** – endoscopic image: free lumen of the HJA zone after lithoextraction

Table I. Minimally invasive interventions for strictures of HJA complicated by cholangiolithiasis

Pathology before the surgery	Type of primary operation	Option of minimally invasive treatment	*N*
Tumor of the pancreatic head	Pancreatoduodenal resection	Percutaneous transhepatic cholangioscopy + laser lithotripsy + balloon dilatation of HJA with lithoextraction	1
Cholangiocarcinoma	Pancreatoduodenal resection	"Rendezvous" procedure: percutaneous transhepatic balloon dilatation of HJA + DBE with lithoextraction	1
Post-traumatic stricture of the common hepatic duct	Roux-en-Y hepaticojejunostomy	DBE-laser recanalization	7
		Percutaneous transhepatic balloon dilatation with lithoextraction + stenting of the HJA zone	2
		DBE-lithoextraction	1

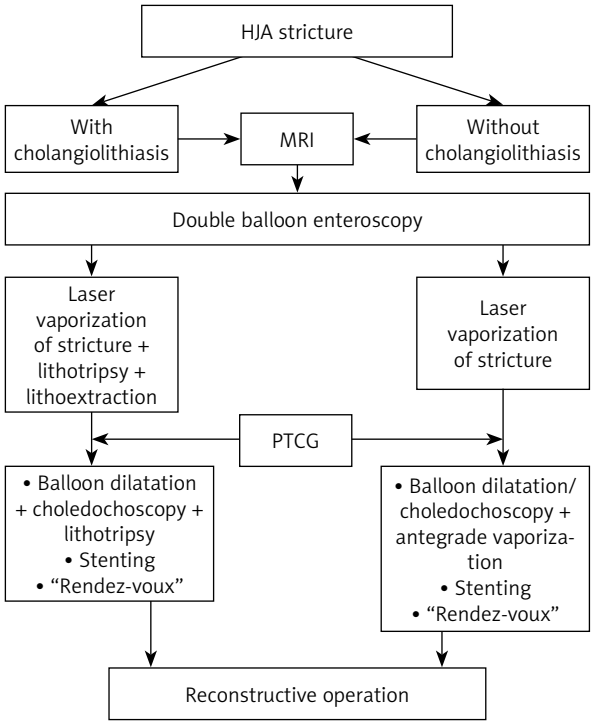

Figure 1. Treatment-diagnostic algorithm of HJA strictures

culties in performing DBE in case of surgically altered anatomy of the small bowel.

In the period from 2002 to 2016 we treated 58 patients with strictures of HJA after previous reconstructive operations on the bile ducts. Thirteen (22.4%) patients developed intrahepatic cholangiolithiasis within 1 to 3 years of the postoperative period. Minimally invasive operations were performed on 12 (20.7%) patients, and repeated reconstructive operations on 46 (79.3%) patients (Table I).

Undoubtedly, present day medical advances and patients' needs spur and facilitate new approaches to treatment. Thus, we have developed and implemented a rare and innovative "rendezvous" technique (percutaneous transhepatic lithotripsy and antegrade balloon dilatation of stricture of HJA with simultaneous retrograde DBE) that can be applied to patients with surgically altered anatomy of the jejunum.

The suggested treatment-diagnostic algorithm allows one not only to identify the stricture and intrahepatic concrements, but also to prevent stone formation using minimally invasive antegrade and retrograde interventions to restore the patient's biliary drainage (Figure 1).

Conclusions

The methods of corrective treatment of strictures of HJA combined with cholangiolithiasis as a follow-up to reconstructive operations on the bile ducts are a priority tool for elderly patients with a concomitant pathology. Nowadays, the combination of antegrade balloon recanalization or laser vaporization of stricture of HJA with retrograde DBE and extraction of concrement fragments is recognized as a new, efficacious and safe treatment of cholangiolithiasis and strictures of HJA.

Conflict of interest

The authors declare no conflict of interest.

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