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Percutaneous "T" and "Y" stenting for palliation of malignant biliary hilar obstruction

Medical Science

KEYWORDS: Self-expanding metallic stents (SEMS).

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ABSTRACT

The purpose of this study is to present the experience of our tertiary care hospital in biliary "T" and/or "Y" conformation stenting for the palliation of malignant biliary hilar obstruction. Malignant biliary hilar obstruction represents 12% of all biliary obstruction cases who undergo percutaneous biliary cholangioplasty at our tertiary care hospital. Malignant biliary bifurcation/hilar obstruction is often inoperable at presentation and has a poor prognosis. Metal self-expanding stents (SEMS) are superior over plastic stents with respect to stent patency rates (evidence level II). Therefore at our institution SEMS are used as only material for biliary malignant occlusion recanalization. Percutaneous "T" and "Y" biliary stenting for hilar obstruction achieves satisfactory palliation of cholestasis and improves quality of life, with a low complication rate.

Introduction

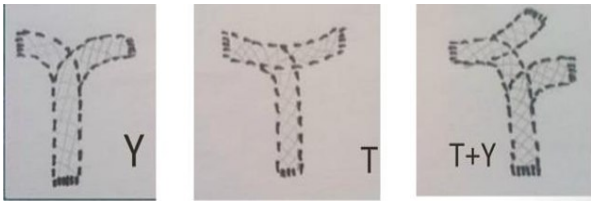
Malignant biliary bifurcation/hilar obstruction is often inoperable at presentation and has a poor prognosis [1]; Open biliodigestive bypass surgery is not possible in most of these patients or has high perioperative mortality rates. The percutaneous transhepatic biliary stenting procedure is performed for patients in whom the endoscopic procedure has been unsuccessful or is technically impossible [1]. Metal self-expanding stents (SEMS) are superior over plastic stents with respect to stent patency rates (evidence level II) [1], therefore at our institution SEMS are used as only material for biliary malignant occlusion recanalization.

At our tertiary care hospital bilobar transhepatic biliary bifurcation stenting procedure is performed in 15 (+/-2) patients/year.

Patients with hilar cholangiocarcinoma (Klatskin tumor) represent the majority of cases, patients with multifocal hilar liver metastasis as well as benign biliary bifurcation occlusion occur more rarely; In literature there are still a lot of unsolved controversies about the management strategy of biliary bifurcation obstruction [2-4]: (a) whether to perform "side-by-side" or "stent-in-stent" manipulation; (b) diameter of SEMS that would ensure longer stent patency rates; (c) which design of SEMS -open or closed cell- will provide longer stent potency rate and easier manipulation;

Biliary bifurcation stenting conformations:
In our practice, we found that parallel ("side-by-side") "Y" stenting is connected to higher occlusion rate, because smaller diameter of stents are usually used for such stenting conformation;

In our practice we found that "stent-in-stent" "Y" or "T" conformation bifurcation cholangioplasty offers longer potency, if using 8- or 10-mm diameter SEMS; these data positively correlate with those of the MOZART I study [2,4]; The aim of this study is to present the experience of our tertiary care hospital in biliary "T" and/or "Y" conformation stenting for the palliation of malignant biliary hilar obstruction;



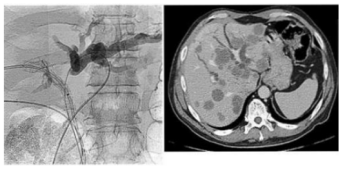
Discussion

Percutaneous biliary access and stenting set used at our institution:
The percutaneous biliary access is performed under combined ultrasound and fluoroscopy control;

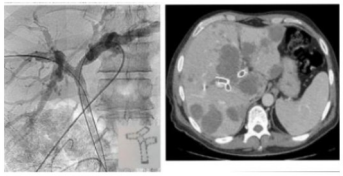
- 22G/18G puncture needle, 0.018" stiff guidewire; 4/5F primary catheter; "Y" connector for position check-up with preservation of guidewire position; 6F or 7F sheath 23 cm with radioopaque distal marker;
- 0.035" stiff hydrophilic recanalization wire; 5F straight (STR) and/or 45°-90° KMP or C2 catheter for recanalization of occlusion;
- SEMS 8-10mm;
- Predilatation balloon catheter (8mm diameter) if occlusion is very stiff and SEMS delivery is difficult;
- Postdilatation balloon catheter (8- 10mm diameter) if significant residual stenosis is noted after SEMS deployment

"T + Y" biliary bifurcation stenting examples:

58 yrs old patient with colorectal carcinoma hepatic metastases causing biliary hilar obstruction, relief of cholestasis is mandatory to start chemotherapy course, endoscopic recanalization failed.



CT prior to percutaneous biliary stenting showing intrahepatic cholestasis.



CT 4 months after "T" and "Y" biliary bifurcation stenting showing absence of lobar cholestasis, but progression of intra hepatic metastases.

Before procedure
- Patient informed consent;
- CBC, biochemistry: S. bilirubin, ALAT, ASAT, y-GGT;
- Fasting at least 6h before procedure; Single shot i.v. antibiotic.
- Coagulation screening - (INR>1.5- relative contraindication);

Excessive ascites requires preprocedural drainage;
During procedure
- Monitoring and correction of vital functions;
- Deep sedation if required;
- Correction of vagal bradycardia during balloon dilatation and stent postdilatation;

After procedure
- Antibacterial therapy 7-10 days for prophylaxis of cholangitis (if indicated);

- Flushing of implanted stent through 10F biliary drainage tube in 2-3 days after implantation, to avoid acute stent occlusion by blood clots or sludge; drain is removed on 2-3d day after manipulation;

- Bilirubin level control in 72hr post procedure; Ultrasound control in 1 month after procedure;

Conclusion:

Percutaneous "T" and "Y" biliary stenting for hilar obstruction achieves satisfactory palliation of cholestasis and improves quality of life, with a low complication rate. Percutaneous "stent-in-stent" over "side-by-side" biliary bifurcation stenting conformation is preferred at our institution. In our experience, comparing laser-cut open-cell nitinol SEMS with closed-cell SEMS, we found that "stent in-stent" implantation of open-cell SEMS was more precise and quick; but with closed-cell SEMS there was less often need for postdilatation, although the patency rates of both stent types were similar. The optimal diameter of SEMS for "stent-in-stent" biliary bifurcation stenting is 8-10mm. We also found that, although "T" conformation stenting decreases procedure time as only a single lobe biliary puncture is required, it is not advisable in a sharp-angled biliary bifurcation; therefore, preprocedural imaging is crucial.

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