

“Approach to Biliary Strictures”

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Biliary strictures represent a challenge and opportunity for endoscopists both diagnostically and therapeutically.

When confronting a biliary stricture, both benign and malignant etiologies must be carefully considered.

Benign causes include:

- Primary sclerosing cholangitis
- Post-operative
- Traumatic
- Cystic duct stone impaction (Mirizzi) syndrome
- Compression from adjacent inflammatory disease (i.e., pancreatitis)
- Autoimmune pancreatitis

Malignant etiologies include:

- Pancreatic carcinoma
- Primary cholangiocarcinoma
- Gallbladder cancer
- Metastatic disease

At initial evaluation multiple questions must be answered before an approach to a diagnosis and treatment can be advanced. These questions include:

1. Benign vs. malignant etiology.
2. The location of the stricture – common bile duct, common hepatic duct, or hilum involving intrahepatic ducts.
3. The duration of the stricture, especially if the etiology is post-operative.
4. The patient's surgical candidacy.
5. The social situation as it relates to compliance issues.

Benign vs. malignant:

Tissue sampling prior to ERCP using endoscopic ultrasound has been the most frequently employed recent technical development. However, there are limitations in the visualization of hilar strictures. ERCP tissue sampling has been performed since at least 1973, with variable results reported from many authors and many centers. The drawback has been the need to provide drainage following tissue sampling for the placement of a stent regardless of the etiology. This may be technically difficult, particularly when dealing with strictures at the level of the hilum. A recent technique of intraprocedural tissue diagnosis has reported a very high yield of preparing a monolayer of forceps biopsy tissue and staining Papanicolaou within the room interpretation. This would appear to have a particular high-yield in the setting of primary cholangiocarcinoma of the bifurcation, which is otherwise a difficult area to sample.¹ The advantage of this technique is the ability to select a metal expandable stent at the initial procedure, as well as to limit the need for additional invasive procedures, such as CT guided biopsy and/or FNA via EUS.

New technologies which may also play a role in the diagnosis of strictures includes intraductal endoscopy. A new disposable 10Fr endoscope to provide cholangioscopy including directed biopsy during ERCP has received favorable initial reports (Spyglass, Boston Scientific).²

Once a malignant etiology of the stricture can be cyto-pathologically confirmed, therapeutic approaches can then be planned. At present there is considerable debate but a growing consensus that the placement of a metal expandable stent for distal malignant strictures, not involving the bifurcation, may well be warranted regardless the patients' candidacy for resection.³

It would appear that this strategy of metal biliary stenting minimizes the risk of premature occlusion while the patient might be awaiting surgery and does not interfere significantly with eventual resection. Care must be taken not to use a stent which overlaps the planned suture line. The presence of the stent can then permit downstaging using radiation therapy and chemotherapy which is undergoing multiple clinical trials. Finally this would appear to be cost effective as it minimizes the need for additional interventions such as repeat ERCP for removal of a plastic stent and/or post-operative ERCP in patients undergoing surgical exploration and found to be unresectable.⁴

At present, considerable controversy still exists regarding the best management choices for malignant biliary strictures of the hepatic bifurcation. A major randomized trial of hilar obstruction, comparing the use one plastic stent vs. two, concluded that the placement of a single stent would appear to be preferential due to the high failure rate of placing the second stent, which frequently resulted in contamination and infection of the undrained lobe.⁵ Further reports have suggested a clear superiority of using metal expandable stents to minimize the risk of infection and ease the technical difficulties.⁶

More recently, surgical centers have accepted greater candidacy for radical surgical resection, including partial hepatectomy. This also complicates the decision making regarding hilar stent placement since SEMS placement can greatly complicate such surgery.

Finally, in truly unresectable patients, there is new data from Germany suggesting that photodynamic therapy might provide long lasting relief of jaundice.⁷ This data at present needs to be compared with newer methods of hilar stent placement.

Benign Strictures:

Following a definitive diagnosis of benignity, the decision regarding endoscopic vs. surgical therapy rests on several important factors. Features which predict a good response to definitive endoscopic therapy will include short stricture length, a recent post-operative injury < 3 months and a mid-common duct stricture, well below the hilum. Obviously, unfavorable features would include the long length of a stricture, a remote post-operative injury and stricturing at the level of the hepatic hilum.

Features which strongly suggest surgery will be necessary include the underlying etiology of chronic pancreatitis, although stent placement in the presence of active acute on chronic pancreatitis may carry a better prognosis. A period of stenting may well prove useful as a bridge to appropriate surgery as it is frequently unclear whether patients warrant Whipple's resection of the head vs. drainage procedures, such as lateral pancreaticojejunostomy procedure.

The second disorder with limited long-term prognosis is primary sclerosing cholangitis. Although patients appear to benefit from short-term stenting, stenting may well represent a bridge to hepatic transplantation.

The preferred endoscopic treatment of benign CBD strictures has become the placement of multiple plastic large bore biliary stents at least in patients with good prognostic features. Long-term follow-up has been reported from the Amsterdam group, involving 74 patients. Their protocol was to place 2 10Fr stents, exchanging them every 3 months, for a total treatment duration of 12 months with resolution of the stricture being the best prognosis feature for long-term patency after stent removal. Overall long term results of 80% resolution approach that of surgical repair.⁸ Notably, all but one restenosis occurred within 6 months.

A variation on this technique has now been reported from Rome, Italy, supporting the use of additional stents to attempt to model the stricture to the diameter of the bile duct itself. In 42 patients, 1 to as many as 6 stents were placed with a duration of therapy again of 12 months.⁹ This technique reported no patients developing clinically significant recurrent strictures in a shorter duration follow-up. These patient groups may not have been comparable as the later study may well have selected patients based on more favorable characteristics than the earlier study performed in Amsterdam.

Managing benign biliary strictures with placement of expandable stents has been reported for a number of years but until recently the lack of removability has proven to be a contraindication to this approach in all but the most unusual circumstances. Removability of the coated Wallstent (Boston Scientific) did stimulate interest in placement for a variety of indications, including the strictures of chronic pancreatitis. The UVA series suggested good success, but with frequent complications, including occasional situations of unremovability and a number of patients lost to follow-up. Obviously caution regarding the placement of a potentially removable stent remains.¹⁰

Some research has been advanced in the use of a biologically dissolvable biliary stent, which would make removable unnecessary. These stents are made of biodegradable polylactide but have had variable research results and at present are not available clinically. A newer, completed coated, variation of the Wallstent is undergoing trials for potential removability (Biliary Wallflex, Boston Scientific) and results are eagerly awaited to see if this might be more effective than the technically demanding multiple plastic stent therapy.

Finally, surgical intervention with hepatojejunostomy has proven to be the treatment of choice in biliary strictures occurring below the bifurcation. Overall the

surgical results have revealed diminishing morbidity and limited mortality, making surgical intervention an appropriate choice for failed cases or patients with poor prognostic signs for successful endoscopic therapy.¹¹

Summary:

There remains a large role for ERCP and EUS in biliary stricture evaluation, tissue sampling, stent placement both as a bridge to surgery including newer downstaging protocols for malignancy, and finally as definitive therapy of benign postoperative strictures.

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