

# Malignant biliary strictures - a flexible view

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## **Abstract**

Endoscopic stenting of malignant biliary strictures offers a relatively safe and cost effective treatment for unresectable malignancies. Jaundice and pruritis can be relieved and this is accompanied by an improved quality of life. The main problem with endoscopic stents is their tendency to block with time. Attempts to extend their useful life have been made by modifying the shape and composition of plastic stents and more successfully, by the introduction of wide bore metal stents. The need to drain all areas of biliary obstruction has been questioned and the role of preoperative biliary drainage has been explored by meta-analyses of previous trials. Palliative intervention for obstructive jaundice in pancreatic and biliary cancer may involve ERCP with stenting or surgery. The available evidence does not indicate a major advantage to either alternative so the choice may be made depending on clinical availability and patient or practitioner preference. Predicted survival The technical skills to perform ERCP are widely available and this modality may be preferred to surgery in some cases due to the lower overall resource utilization and shorter hospitalization. The above paragraph is taken from the United States National Institute of Health State Of The Art Conference Statement on the role of ERCP and diagnosis therapy published in June 2002.<sup>1</sup>

In South Africa, as in the USA, only a minority of patients presenting with malignant bile duct strictures are candidates for surgical resection at diagnosis due to the presence of local or vascular invasion or metastatic disease. Because of this the palliation of jaundice and associated pruritis is often the main concern of clinicians in this setting. Fortunately most centres in South Africa have endoscopists skilled in ERCP and hence because of its low morbidity and mortality and short hospital stay, endoscopic stenting techniques are here, as in the USA, considered first line treatment in many cases of inoperable or unresectable malignant biliary strictures. In contrast to its role as a therapeutic procedure ERCP has become largely unnecessary for the diagnosis of cancer in a patient presenting with obstructive jaundice. Contrast enhanced CT scanning or MRCP

is usually sufficient for staging prior to surgical intervention. Despite the high specificity of tissue sampling at the time of the ERCP sensitivity is still relatively low (15-70 %) even when the results of cytology and intraductal biopsy are combined. Furthermore preoperative ERCP may complicate or preclude surgical intervention.<sup>1</sup> The main limiting factor in the use of endoscopic stents is stent blockage. Plastic stents are relatively cheap and easy to insert but tend to become blocked after 3-4 months. The reasons are complex involving bacterial contamination, the deposition of a biofilm on the inner surface of the stent and the subsequent accumulation of biliary sludge. A number of factors including size, stent shape and construction materials may effect this process. As to size, there is some evidence that 10 French stents have longer patency compared to smaller diameters and no advantage was found for 11.5 French stents compared with the 10 French. The in vitro observations that Teflon appeared to be a better material than polyurethane and that side holes increased the amount of biliary sludge led to the introduction of the novel Tannenbaum or Christmas tree stent by Wilson Cook. This stent uses Teflon as the stent polymer, does not have side holes and the anchoring flaps do not extend to the wall of the stent. The design features were expected to provide a longer patency rate. However when this stent was compared with the standard polyurethane stent in a blinded randomized control trial no significant difference in the patient's survival rate or stent patency was observed.<sup>2</sup> Variations in stent polymer composition were further explored with the use of a hydrophilic polymer coating on polyurethane stents. Once again a control trial failed to show any advantage. Trials of antibiotic prophylaxis to prevent stent blockage have had mixed results and its use is not generally recommended. In contrast to relatively unsuccessful attempts to modify plastic stents to achieve longer patency, the introduction of expandable metallic stents has been a significant advance. These stents, usually 30 French in diameter, when fully expanded have been shown in distal malignant biliary obstruction to achieve a longer period of patency, to be more cost effective and to have a decreased rate of post stent cholangitis.<sup>3</sup> Similar advantages have been demonstrated for these stents when used in the palliation of non resectable hilar strictures.<sup>4</sup> With the Schneider Wallstent a median overall stent patency of 231 days has been reported with a 1,3,6 and 12 months cumulative patency rates of 97.1 %, 83.5 %, 56.2 %

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and 41.4 % respectively.<sup>4</sup> The advantages of the longer patency of metal stents appear to be translated into shorter hospital stays, fewer repeat ERCPs and in general lower costs.<sup>5</sup> The cause of stent occlusion tends to be tumour ingrowth, distal and proximal tumour overgrowth and encrustation. In an attempt to reduce tumour ingrowth metal stents with polyurethane coating were designed. Studies however have tended to show no statistical difference between these and uncovered metal stents and there is a suggestion that occlusion of the pancreatic and cystic ducts by covered stents may predispose to pancreatitis and cholecystitis.<sup>6</sup> Because of the relatively high costs of metal stents attempts to rationalize their use have been made. These stents are now considered to be cost effective in patients who survive for more than 6 months. As a rule of thumb it has been suggested that the presence of liver metastases is a predictor of poor survival and hence plastic stents are perhaps best reserved for patients in whom such metastases have been demonstrated.<sup>7</sup> In South Africa the recent introduction of South Korean manufactured metal stents, some with unique design features should go some way towards both improving the ease of stenting complex hilar strictures and reducing the costs of metal stents in general. It seems reasonable that the optimum palliation of malignant biliary strictures involves not only relieving jaundice but also cholestasis and hence susceptibility to cholangitis. This would involve the complete drainage of the intrahepatic ductal system. In practice when multiple main intrahepatic ductal branches are blocked stent placement in a single branch draining at least 30 % of liver parenchyma will relieve jaundice although not cholestasis.<sup>8</sup> Complete drainage and the relief of cholestasis would require that the number of stents should equal the number of obstructed branches. Earlier reports of longer survival in patients having complete drainage would suggest that particularly where contrast has been injected in to both lobes of the liver bilateral drainage at least should be associated with a lower morbidity due to sepsis. These theoretical considerations have been confounded by results of trials claiming no difference in outcome between single lobe and bilobe drainage.<sup>9</sup> A recent report suggests that magnetic resonance cholangiography may be used to identify the best hepatic segment to drain and that by injecting contrast and positioning a single stent in the selected duct cholangitis can be considerably reduced.<sup>10</sup> Does pre operative endoscopic drainage adversely affect the results of surgery? Although routine preoperative biliary drainage particularly of the external variety has now been largely abandoned the results of endoscopy drainage on post operative morbidity and mortality have yielded conflicting results. Clarification of this matter would seem to be of importance both to the endoscopist who encounters an unexpected malignant looking biliary stricture while searching for a putative common duct stone and also to endoscopists faced with deeply jaundiced patients in whom resectable lesions are suspected but surgery needs to be delayed for one reason or another. A recent meta analysis of the available data has found no positive or adverse effects of preoperative biliary stent placement on the outcome of surgery in patients with a pancreatic cancer and hence stent placement in this situation can no longer be

considered harmful.<sup>11</sup> In centres with adequate experience and case volume, endoscopic stent placement has a technical success of nearly 90 %. Clinical success in palliating jaundice and itching should be expected in more than 80 % of patients. Such palliation has recently been shown to be associated with improvements in social functioning and mental health.<sup>12</sup>

Nevertheless it remains true that what is desirable is sometimes not possible and what is possible is not always appropriate, thus emphasizing the need for advanced endoscopic skills to be accompanied by compassion and sound clinical judgment. Unfortunately these latter virtues are hard to quantify and are generally not subjected to control clinical trials.

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# Malignant biliary strictures - a surgical perspective

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Dr Pettengell has put the flexible point of view in a comprehensive and pragmatic manner. There are some perspectives which as a surgeon who operates and performs therapeutic ERCP on patients with malignant biliary obstruction I feel merit comment. These in summary are the decision to stent, help from colleagues, and implications of neoadjuvant treatments.

The first is the investigative and management algorithm for such patients. Appropriate investigation will allow one to make the correct therapeutic choice prior to ERCP. This approach is detailed in an article by Clarke et al.<sup>1</sup> It essentially entails tailoring treatment according to accurate staging, comorbidity assessment and technical expertise. If one adopts this approach one can largely restrict the use of stenting to those in whom it is mandatory (those who need it as part of therapy) and those for whom it is definitive treatment. These decisions should be made by a team, surgeon, interventional ERCP artist, pathologist, oncologist and interventional radiologist.

The latter is an essential technical member because once one has decided to provide biliary drainage it should be achieved. Fiddling without achieving drainage is likely to produce life threatening cholangitis. Being able to tackle the problem from both the top and the bottom metachronously or occasionally synchronously is essential for success. This is particularly true of the hilar region where success from below is more problematic, and is a region we favour a primary percutaneous approach.

Though ERCP has declined as a diagnostic tool its role as a therapeutic tool is likely to expand. This is due to a change in direction of overall treatment strategies in those with resectable disease. Pancreatico-duodenectomy now has consistently low perioperative mortalities and the focus has shifted to try and improve on the terrible long term outcome of the disease. Hence the adoption of neo adjuvant therapies.<sup>2,3</sup> These regimens involve significant delay before surgery and necessitate biliary drainage of seven weeks or more.<sup>2,3</sup> This approach, even in the best of hands results in a 15% cholangitis rate and a 7% re-intervention rate. Therefore good follow up and close supervision is required if deaths are to be avoided.

This neoadjuvant approach also requires close liaison with

a pathologist as a tissue or cytological diagnosis is necessary prior to therapy.<sup>4</sup> Most approaches to tissue sampling have a high specificity for the diagnosis of malignancy but lack sensitivity.<sup>4</sup> EUS is emerging as the tissue sampling technique of choice where expertise is available and this badly needs to be developed in South Africa.

Keith has alluded to predicting survival and tailoring the type of stent to the predicted outcome and one article which sheds light on the pros and cons of this approach is worth reading.<sup>5</sup> In addition quality of life issues are well addressed in several articles but I commend the Sloan Kettering approach.<sup>6</sup> Reading both may help one to hone "compassion and sound clinical judgment" and not get carried away with the technical challenges which still exist and sway the technocrat working in isolation into unnecessary action. New treatment strategies however mean a busy future for skilled interventionalist members of the team. Their aim, in a much bigger overall therapeutic picture, is to keep the biliary tract efficiently and effectively drained.

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