Preoperative biliary drainage (stenting) for treatment of obstructive jaundice

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Abstract
The role of preoperative biliary drainage in malignant obstructive jaundice has been controversial. Laboratory studies suggest that relief of jaundice prior to major pancreatic resection would be associated with improved morbidity and mortality. However, clinical experience has not supported the laboratory results. Obstructive jaundice can be relieved preoperatively via an endoprosthesis introduced either percutaneously or endoscopically. Cohort studies have not shown any clinical benefit and in some the endoprostheses have been implicated in postoperative complications. The only randomized study has shown no benefit in preoperative drainage, but one recent study has confirmed that endoscopic drainage, whilst not conferring an advantage, did no harm. Hence, whilst preoperative drainage is not recommended, if for any reason operation needs to be delayed, endoscopic drainage via an endoprosthesis can be used without fear of adversely influencing the outcome.

Key Words: endoprosthesis, malignant jaundice, pancreatic cancer, obstructive jaundice

Background
Cancer of the pancreas is the fourth leading cause of death in western countries. It is associated with poor prognosis. Surgical resection is the only curative treatment. Surgery in patients with malignant obstructive jaundice is associated with increased risk of postoperative complications [1,2] and significant mortality in spite of advances in operative technique, intraoperative management and postoperative care. The operative mortality in experienced units is <5%. Surprisingly, the decrease in operative mortality after pancreaticoduodenectomy has not been associated with similar reduction in morbidity rates. Today in high-volume centers the morbidity ranges from 40% to 75% [3,4].

In 1953, Whipple described pancreaticoduodenectomy as a two-stage procedure. Surgical biliary drainage was done in the first stage to reduce jaundice and improve hepatic function. This was followed by the second stage, which comprised resection of the tumour. The need for biliary drainage prior to surgical resection has been the subject of controversy. Biliary obstruction causes pruritus, cholangitis and malabsorption, leading to nutritional deficiency, weight loss and progressive liver failure. It has been noted in various studies that major postoperative complications such as anastomotic leak of pancreaticoenterostomy, haemorrhage and renal failure are more common when jaundice is present [5–7]. To decrease these complications and mortality, biliary drainage prior to resectional surgery has been proposed as a mechanism to reverse the pathophysiological disturbances seen in the jaundiced patients and to relieve symptoms of jaundice and pruritus and prevent liver failure.

Preoperative biliary drainage procedures are widely used in palliative management of obstructive jaundice secondary to periampullary tumours. Biliary drainage can be done either externally, by inserting transhepatic stents, percutaneously or internally by endoscopic retrograde cannulation of the common bile duct with an endoprosthesis. The influence of these procedures on morbidity and mortality after pancreaticoduodenectomy has been debated, as the clinical results have not matched the theoretical predictions – which were based on preclinical studies [8–12].
Animal studies

Studies in jaundiced rats have suggested that following internal biliary drainage there is an improvement in the nutritional status and reduction in endotoxaemia [13,14]. It has also been shown that there has been improvement in immune function following internal biliary drainage [15] of animals with induced obstructive jaundice. However, these promising preclinical findings have not translated to comparable results in patients undergoing major resectional surgery.

Clinical studies

There have been many studies addressing the advantages and disadvantages of preoperative biliary stenting for distal biliary obstruction. Most of these are retrospective cohort analyses. A recent retrospective review conducted by Evans et al. has shown that biliary placement of expandable metallic stents does not increase pancreaticoduodenectomy-associated complications [16]. The study did not show improvement in morbidity or mortality; however, it did suggest that if for whatever reason resectional surgery is delayed, then relief of jaundice via an endoscopically placed endoprosthesis did no harm. Prior to this study a number of other retrospective studies had suggested that placement of biliary stents increased perioperative morbidity [17,18] and mortality [19].

Biliary stents have been shown to lead to cholangitis because of bacterial contamination as a result of clogging of the stent. Stent-induced inflammatory response in the bile duct wall is thought to be a risk factor for bilio-enteric anastomotic leak [19,20]. In addition, endoscopic retrograde cholangiopancreatography and percutaneous transhepatic cannulation have their inherent complications of pancreatitis, bleeding, duodenal perforation, catheter displacement and leakage.

To date there has been only one randomized clinical trial involving preoperative internal biliary stenting via the endoscopic approach in jaundiced patients undergoing surgery for distal malignant obstruction of the bile duct [21]. It demonstrated that despite improvement of liver function tests following placement of an endobiliary stent there was no demonstrable benefit in the morbidity or mortality for patients having the stent as opposed to those who underwent surgery. However, similar to the Evans study, the patients with the stents were not made worse. Two meta-analyses on the efficacy of preoperative biliary drainage for tumours causing obstructive jaundice concluded that there was no benefit of preoperative biliary drainage and it should not be routinely performed [22,23]. However at the same time these studies have also shown that preoperative endoscopic drainage did not increase the morbidity or mortality. Hence if there is a need for delay of a resectional procedure, relief of jaundice via an endoprosthesis may be carried out without fear of increase in postoperative morbidity or mortality.

References

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