Many patients develop metastatic disease to the liver, and the significant global burden of chronic liver disease is driving the development of more and more primary liver cancers. Resection or transplantation offers the potential for cure or greatly improved survival. It is timely then that BJS should produce an issue focused on liver surgery. Recent improvements in the safety and effectiveness of liver surgery have undoubtedly been founded on improvements in patient selection, operative technique and perioperative care, and the papers in this issue cover all of these domains.

Hobeika and colleagues1 from Paris used CT-based assessment of liver surface nodularity to assess fibrosis and cirrhosis, measuring surface characteristics of the interface between the surface of the left lobe and the adjacent fat plane. The technique could be performed in almost 90 per cent of patients’ scans. Surface nodularity increased with hepatic venous pressure gradient, severity of steatosis and degree of fibrosis, and was independently associated with severe complications including post-hepatectomy liver failure. A specific cut-off value for surface nodularity could be identified (2.63) below which posthepatectomy liver failure did not occur. Surface nodularity therefore seems to offer a technique for assessing liver background disease, which has direct relevance to the consequences of liver surgery. It has a lower degree of complexity in set-up than competing technologies for measuring liver function, such as methacetin breath testing (LiMAX) or mebrofenin scintigraphy; however, importantly, the latter test can give regional liver functional information which surface nodularity cannot2. Other technologies, such as liver-focused MRI, will also inevitably compete for the ability to provide functional data on the liver.

Another imaging-based study came from Yan and colleagues3 in a collaboration between Chinese and Australian centres. This study set out to establish a new classification of anatomical variations of the hepatic arteries. The classification is based on a detailed study of almost 800 three-dimensional reconstructed CT images from patients’ livers and focuses on the origin of vessels. Using this classification, the authors described nine types of hepatic arterial arrangement, which encompass 26 individual subtypes. Some of these are very common and some are very rare; however, the classification appears to be more comprehensive than existing anatomical classifications and the rule basis is fairly easy to understand. Adoption of classification systems into clinical practice is notoriously fickle and difficult to predict, but it is easy to see how this classification could be useful in a number of settings including complex resections, reporting injury, and conveying information between liver procurement teams and the transplanting centre.

Minimizing blood loss in liver surgery is a common aspiration of both surgeons and anaesthetists. A pilot RCT of phlebotomy resulting in controlled hypovolaemia to prevent blood loss in major hepatic resection (PRICE-1) was reported by Martel and colleagues4 from Ottawa. The protocol randomized patients scheduled for major liver resection to either removal of 7–10 ml blood per kg 30–60 min before anaesthesia with no intravenous fluid replacement, or standard care. Blood was then returned as an autologous transfusion shortly after the procedure. Although the study showed that the protocol was feasible, and the estimated blood loss was 111 ml less in the hypovolaemic group than in controls, the difference was not statistically significant. The authors have proposed a larger follow-up trial (PRICE-2) that will be adequately powered to detect a smaller difference in estimated blood loss. Donated blood is an expensive and scarce resource, with all of the inherent risks of allogeneic transfusion that have been well documented in the past, such as immunosuppression and infection. Minimizing the need for transfusion is therefore an important goal. Hypovolaemic surgery with autotransfusion has been around for quite a while now, but has not gained much traction beyond a few centres. Perhaps the reason for the lack of adoption is the lack of controlled trial evidence; this study may go some way to rectifying that problem, particularly if PRICE-2 is able to demonstrate a significant benefit.

In an international multicentre study, Morise and co-workers5 explored the feasibility of undertaking repeat liver resection for hepatocellular carcinoma (HCC) laparoscopically. They identified more than 600 patients who underwent laparoscopic resection...
repeat liver resection and compared them with almost 1000 patients who had same procedure via an open approach, both as whole groups and using a propensity score matching system (238 patients in each group). Overall, there was less blood loss, and shorter operating time and hospital stay in the laparoscopic group. The reduced blood loss with laparoscopic surgery was also seen in the propensity score-matched analysis, although operating time was longer in contrast to the overall analysis. There are many reasons why laparoscopic resection may offer advantages in patients with HCC, not least the reduction in risk of hepatic decompensation and the potential benefit of fewer adhesions, making repeat resection or liver transplantation easier in the future should this be necessary.

The BJS hepatobiliary issue contains two prognostic scoring systems for HCC. The first, from Tsilimigras and colleagues in an international collaboration, assessed the ability of the HCC tumour burden score to stratify prognosis after resection in more than 1000 patients. The score is based on an equation derived from the sum of the squares of the maximum tumour diameter and total number of tumours, and was validated internally and against an external data set. The key findings were that the tumour burden score was able to discriminate outcome in both Barcelona Clinic Liver Cancer stage A and stage B cohorts. This is potentially important and shows that prognosis is based not only on background liver function but also on tumour burden. The tumour burden score will hopefully have value in advising patients undergoing surgery as well as providing a mechanism for comparing international cohorts of patients.

The second study, from Zhang et al., in a national collaboration from China, described the development of a prognostic model for identifying candidates for hepatectomy in patients with HCC and hepatic vein invasion. The whole study involved 850 patients. The model was derived using resected and non-resected cohorts, and validated using both an internal and external cohorts of patients.

The BJS hepatobiliary issue includes a paper from Wallace and colleagues reporting short- and long-term outcomes for patients with and without HCC who underwent liver transplantation in the UK. They undertook an analysis based on 1879 liver transplant recipients with HCC and 7661 without HCC. Patients were stratified into four eras between 1997 and 2016. Over this interval there was a greater increase in the use of donation after cardiac death livers but a reduction in short-term mortality. Overall, there were improvements in graft and patient survival in progressive eras attributed to short- and long-term mortality, in turn likely related to improvements in surgical and perioperative care and postoperative management respectively. Liver transplantation remains a highly effective treatment option for patients with HCC; however, there is a continuous requirement to balance the minimum entry requirement for transplantation to offer fair treatment to HCC-bearing and unaffected patients.

The hepatobiliary issue of BJS brings a broad spectrum of innovative studies that will undoubtedly contribute to change in clinical practice and evolution of this challenging specialty.

Disclosure

The author declares no conflict of interest.

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