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GUEST EDITORIALS

Recent advances and controversies in surgical management of liver diseases: Summary of Liver Sessions of 7th World Congress of IHPBA 2006

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Introduction

Over the past few years, there has been significant progress in the surgical management of various liver diseases as a result of advances in surgical technologies and the effort of liver surgeons around the world to improve the treatment outcome of their patients through active research. However, partly because of the paucity of high-level evidence in the literature, there are still a lot of controversies in several areas in liver surgery. The programme of the 7th World Congress of the International Hepato-pancreato-biliary Association held in Edinburgh on 3–7 September 2006 has incorporated most of the recent advances and controversies in liver surgery. The main topics presented and discussed in various keynote lectures, symposia, and free paper sessions of the Congress can be summarized into five areas: advances in surgical techniques of liver resection, role of ablative therapies, applications of liver transplantation, recent trends in management of colorectal liver metastasis, and controversies in management of hepatocellular carcinoma (HCC).

Advances in techniques of liver resection

The main challenge of liver resection is the control of bleeding during liver transection. Finger fracture or clamp crushing are the conventional techniques of liver transection widely used in many centers. Ultrasonic dissection, introduced in the early 1990s, has become a standard technique in other centers. In recent years, a few other techniques or instruments based on new technologies have been developed, with an aim towards bloodless hepatic resection. These include the water jet, harmonic scalpel, Ligasure, Tissuelink and radiofrequency-assisted liver transection. The pros and cons of these techniques were presented in a keynote lecture by the author, with a particular emphasis on the evidence from a few randomized trials comparing different techniques recently available in the literature [1–4]. In addition to advances in technologies and instruments, the understanding of the importance of inflow vascular control and low central venous pressures is another major contribution to lower blood loss in hepatic resection. The role of the Pringle maneuver was the subject of debate in a session in the Congress. While a previous randomized trial from the author's institution showed that intermittent Pringle maneuver reduced blood loss during liver resection [5], a more recent randomized trial conducted by an Italian group showed no benefit of the use of the Pringle maneuver [6]. The recent demonstration of an adverse effect of ischemic-reperfusion injury on long-term tumor recurrence in the liver remnant in an animal model by a Dutch group raised a concern about the use of the Pringle maneuver [7]. In the Congress, the same group presented a paper showing that prolonged use of the Pringle maneuver in liver resection for colorectal metastasis significantly reduced the disease-free survival of patients based on a retrospective analysis [8]. This further intensified the debate on the use of the Pringle maneuver. Data from a prospectively randomized cohort are required to provide more definite evidence regarding the effect of the Pringle maneuver on long-term tumor recurrence after resection of liver cancers. However, in experienced centers, low blood loss and transfusion rates can now be achieved in liver resection without the Pringle maneuver [9].

The other important recent advance in liver surgery is laparoscopic liver resection, which started later than

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laparoscopic surgery in other intra-abdominal procedures because of difficulty in control of bleeding during liver transection in the laparoscopic setting. The new instruments developed for liver transection can all be used in the laparoscopic setting, allowing better control of liver transection. As a result, there has been rapid development of laparoscopic resection in recent years, with about 1000 cases reported in the literature to date. While earlier reports contended that laparoscopic liver resection should be confined to resection of anterior segments and left lateral segments of the liver, in this Congress, a few groups from experienced centers have demonstrated that laparoscopic right or left hepatectomy is feasible and safe in their hands. In a recent report, Cherqui et al. [10] demonstrated that laparoscopic liver resection can achieve mid-term survival results similar to open resection for patients with HCC.

Increasing role of liver ablation

Ablative therapies, especially radiofrequency ablation (RFA), are gaining popularity in the management of liver malignancies. In a symposium in the Congress, the importance of performing RFA in experienced centers to reduce morbidity and increase complete ablation rate was emphasized based on experience reported in two recent publications [11,12]. Furthermore, the role of surgeons in ablation of RFA was highlighted by a recent study that suggested that a surgical approach achieved a more complete tumor eradication and lower tumor recurrence rate compared with a percutaneous approach in a meta-analysis of 5224 cases of RFA for liver malignancies reported in the literature [13]. The role of surgical ablation is further supported by a study from the author's group that showed that RFA by surgical approaches resulted in significantly better survival compared with the percutaneous approach for patients with HCC 3–5 cm in diameter [14]. Microwave ablation is another modality of thermal ablation that could achieve rapid ablation of a large volume of liver with recent development of a more powerful microwave system [15]. Encouraging clinical data presented in the Congress suggested that ablation of large tumors using the new generation of microwave system is safe and effective.

Whether thermal ablation such as RFA can replace resection as a curative treatment for small HCC <5 cm in diameter is a controversial subject that has been discussed in the Congress. With its minimal invasiveness and safety, RFA is an attractive option for patients, but whether it could achieve similar long-term oncological results to liver resection remains unclear. Two non-randomized studies suggested that resection is associated with a lower tumor recurrence rate compared with RFA [16,17], and one of the studies also demonstrated better long-term survival with resection [16]. However, a recent randomized controlled study suggested that RFA may achieve similar long-term recurrence-free and overall survival compared with resection [18]. Further randomized trials are needed to more clearly define the role of RFA versus resection for small HCC.

Expanding the application of liver transplantation

Liver transplantation is the best treatment option for end-stage liver disease, including early HCC associated with advanced cirrhosis. However, the application of liver transplantation is severely limited by the shortage of deceased donor grafts, hence many patients die from progression of the disease while waiting for a graft. In the Congress, several measures to expand the use of liver transplantation have been presented and discussed, including the use of marginal grafts (age >65 years, macrosteatosis $>40\%$, cold ischemic time >12 h, hepatitis B or C infection, etc.), non-heart-beating donor grafts, split liver grafts, and live donor grafts.

The use of marginal grafts is associated with increased risk of primary graft dysfunction but no significant effect on mortality or long-term survival provided that re-transplantation is a possible option [19]. Good outcome can be achieved with the use of split grafts; however, its application is limited by logistic restrictions in many centers [20]. The use of non-heart-beating donor grafts requires careful graft selection to ensure reasonable graft quality so as to reduce the risk of early graft failure or ischemic cholangiopathy associated with prolonged warm ischemia [21]. Liver donor transplantation provides good quality grafts and a much larger potential pool of donors compared with other types of grafts. However, the risk to the donor and the problem of small-for-size grafts limits its application. Nevertheless, there has been increasing use of live donor liver transplantation worldwide. A study of 1709 patients with liver donor liver transplantation performed in 64 European centers presented in the Congress reported favorable results with a donor mortality rate of 0.23%, 5-year graft survival of 70%, and 5-year recipient survival of 76% [22].

The availability of graft also affects the role of re-transplantation, which was another topic discussed in the Congress. Technical advances have reduced the need for re-transplantation for vascular or biliary complications, and improved immunosuppression has decreased re-transplantation for graft rejection. On the other hand, increased use of marginal grafts has led to increased requirement for re-transplantation, and the problem of recurrent viral disease, in particular hepatitis C viral infection, remains a common indication for re-transplantation in the long term [23].

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