

## Techniques and innovations in liver surgery

Since the development of laparoscopic cholecystectomy in 1987, the laparoscopic approach extended to several abdominal procedures. However, liver laparoscopic approach remains during a long time limited, contrarily to abdominal surgery. It is mainly due to the technical complexity of interventions, the lack of appropriate instrumentation, the risk of gas embolism, of uncontrolled bleeding, the difficulty to detect intra-operatively in real time the tumour, the fear of not being able to follow oncological principles with a subsequent risk of tumoral dissemination.

The mini-invasive hepatic resection and the future innovation in this field will be showcased in a focused issue of *HepatoBiliary Surgery and Nutrition (HBSN)* focused on these compounds entitled “Techniques and innovations in liver surgery”.

After an editorial by Prof. Belghiti, clearly outlining the problem in the future in hepatic surgery, we present an update on the changes after the second consensus conference held in October 2014 in Morioka. The most important message from this consensus meeting is to protect patients from this new surgical procedure. Three actions were proposed for the protection of patients: prospective reporting registry for transparency, a difficulty scoring system to select patients, creation of a formal structure of education.

Then, two manuscripts were specifically interested in the treatment of colorectal liver metastases (CRLM). An original article compared short-term results of the laparoscopic and open approach for hepatectomies performed for CRLM using a propensity score. Laparoscopic liver resections for CRLM seem to yield short- and long-term results, which are similar to open hepatectomies, and could well be considered an alternative to open surgery and become the gold standard in carefully selected patients. The strength of this study is the use of the matching technique based on the propensity score, as it simulates randomization and eliminates confusion caused by variables used to create the study groups. The second manuscript is a review that assesses outcomes of laparoscopic liver resection compared to open liver resection for the surgical treatment CRLM. It reveals that laparoscopic liver resection can reduce estimated blood loss and major morbidity. No included study reported inferior survival outcomes with laparoscopic approach. Acknowledging limitation of low strength of evidence, this review indicates that laparoscopic liver resection is feasible and safe in terms of short and long-term post-operative outcomes.

Robotic approach is increasingly developed. Prof. Giulianotti, which probably has on of the greatest expertise in robotic surgery, reports his experience with technical details and a review of the literature on this subject. The overall data present in current literature suggests that robotic liver resections are at least comparable to both open and laparoscopic surgery in terms of perioperative and postoperative outcomes.

Then, two articles addressing the new prospects in hepatobiliary surgery. The fluorescence and bile excretion of indocyanine green can be used for real-time visualization of biological structure. High intensity focused ultrasound (HIFU) is emerging as a valid minimally-invasive image-guided treatment of malignancies. A review reports the current state of the art of HIFU therapy applied to the digestive system and hepato-bilio-pancreatic and discusses some promising avenues of the technology. Digestive system clinical applications of HIFU are limited to pancreatic and liver cancer. It is safe and well tolerated. HIFU seems to add clear survival advantages over trans-arterial chemo-embolization alone and similar results when compared to radio frequency for hepatocarcinoma. For pancreatic cancer, HIFU achieves consistent cancer-related pain relief. Further research is warranted to improve targeting accuracy and efficacy monitoring. The last article is a “How I do it” describing in detail the different laparoscopic clamping maneuver.

We would like to thank of the authors who have provided excellent reviews and original articles to this focused issue. We believe that the time and care that the authors have invested in this focused issue offered interesting information.



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