

AUTHORS' REPLY

Dear Sir,

We would like to thank Dr Chang and his colleagues for their comments⁽¹⁾ on our article, "Starting a laparoscopic hepatectomy programme".⁽²⁾ Patient selection has a profound effect on patient outcomes following surgery, particularly when the surgeons are still on the learning curve. The message of our paper was how to "start" laparoscopic hepatectomy safely. Patient safety is of paramount concern. Any mortality in a new programme will curtail that programme, and it may also beg the question of whether the mortality could have been avoided if the operation was done the traditional way.

Contrary to what Chang et al mentioned, we were not proposing a "standard" method, but rather a "stringent" selection. Our "stringent" criteria include small tumours in the peripheral segments requiring the removal of less than three liver segments, i.e. minor hepatectomies only.⁽³⁾ Even then, the ICG-15 should be less than 20%. Hence, any patients requiring major hepatectomies would be excluded from a laparoscopic hepatectomy in our initial experience, but we would still offer them the open approach. Certainly, as our experience builds, this policy may change.

With regard to our surgical technique, we completely echo what Chang et al wrote in the last paragraph regarding varying the techniques according to the surgical situation. Indeed, the practice of surgery is as much an art form as it is a science. Nonetheless, we would like to address Chang et al's queries on our surgical technique.

Our paper was by no means an endorsement of the Harmonic scalpel, although it has served us well in our first five patients, even in that single patient with cirrhosis.⁽²⁾ We were not aware of any head-to-head comparison of the Harmonic scalpel with the LigaSure for human hepatectomies, much less cirrhotic livers, in the literature. Although there was a paper comparing these techniques on an animal model, it was concluded that there was no difference.⁽⁴⁾ Nonetheless, we appreciate Chang et al sharing their favourable experience with the use of the LigaSure in cirrhotic livers. As for the placement of ports, having the camera port placed at the umbilicus did not impede our operations for these five patients in any way. As mentioned, we only selected patients with lesions in segments II, III, V and VI. For such lesions, as in open surgery, suprahepatic caval dissection was unnecessary. However, for our laparoscopic lateral sectionectomies, we divided the falciform ligament and the left triangular ligament for two reasons: one, this facilitated the intraoperative ultrasonography, particularly of the umbilical fissure region; and two, we used the divided ligamentum teres as a "handle" to align the liver with the ports to facilitate transection. Regarding the use of central venous catheters, we routinely inserted this for our patients scheduled for hepatectomies, even for laparoscopic cases, and particularly for these first five patients, when conversion was a real possibility. A low central venous pressure (CVP) has been shown to reduce intraoperative blood loss.⁽⁴⁾ For our laparoscopic cases, we tried to keep the CVP below 8 cmH₂O, while for our open cases, including those who had to be converted from a laparoscopic approach, we will lower the CVP to less than 5 cmH₂O.

At the point when our manuscript was written and submitted, we did not identify any case reports of air embolism in humans associated with laparoscopic hepatectomies, although there were reported cases in porcine models of laparoscopic hepatectomies.⁽⁶⁾ This is not to say that it will never happen. As alluded to by Chang et al, it has happened even in laparoscopic colorectal resections; and indeed, more recent publications have reported such a complication.⁽⁷⁾ Although we were not aware of any human examples when we first started this programme, we were nonetheless mindful of it, and as such, we had taken every precaution in all our five patients to reduce this risk, including a low pressure pneumoperitoneum and a slight Trendelenburg position of 10°. As the angulation was very mild, we did not encounter any issues with gravitating viscera obscuring our view.

We emphasise that the focus of this paper was to share with readers our early experience with this approach, in particular our selection criteria, albeit somewhat stringent, just so as to assure a good and safe outcome. The enthusiasm for pushing the frontier must not be at the expense of patient safety.

Yours sincerely,

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REFERENCES

1. Chang SKY, Madhavan K, Lomanto D. Comments on: Starting a laparoscopic hepatectomy programme. *Singapore Med J* 2009; 50:922-3.
2. Wang E, Kow AWC, Chan CY, Liau KH, Ho CK Starting a laparoscopic hepatectomy programme. *Singapore Med J* 2009; 50:354-9.
3. Gagner M, Rogula T, Selzer D. Laparoscopic liver resection: benefits and controversies. *Surg Clin N Am* 2004; 84:451-62.
4. Jersenius U, Fors D, Rubertsson S, Arvidsson D. Laparoscopic parenchymal division of the liver in a porcine model: comparison of the efficacy and safety of 3 different techniques. *Surg Endosc* 2007; 21:315-20.
5. Lai PBS, Lee KF, Wong J, Li AKC. Techniques for liver resection: a review. *The Surgeon* 2007; 5:166-74.
6. Schmandra TC, Mierdl S, Bauer H, Gutt C, Hanisch E. Transoesophageal echocardiography shows high risk of gas embolism during laparoscopic hepatic resection under carbon dioxide pneumoperitoneum. *Br J Surg* 2002; 89:870-6.
7. Hu MG, Liu R, Luo Y. Laparoscopic hepatectomy for hepatocellular carcinoma. *Zhonghua Wai Ke Za Zhi* 2008; 46:1774-6.