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Techniques for reduced blood loss, transection time and bile leak rate during liver resection in a multinational study

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Introduction. Liver resection has now become a relatively safe and standard practice in the treatment of primary and secondary liver tumors. Recent innovations in technology and surgical techniques have improved safety and efficacy during liver parenchymal transections. We have previously shown in animal and human trials that the use of radiofrequency coagulation of the transection plane (InLine Radio Frequency (RF) Linear Coagulator, Resect Medical, Inc., Fremont CA) prior to liver resection is a safe and effective device which can significantly reduced intra-operative blood loss and transection time. However, post operative bile leaks remains an important clinical issue during liver resections with some units reporting typical leak rates of between 10 to 15%. We would like to report our multinational experience.

Method. From a multinational study between November 2003 to August 2005, 53 liver resections were performed using the cavitronic aspirator for other parenchymal transection deviation device after InLine RF Coagulation of resection plane. Data was collected prospectively for tumor characteristics, operative outcomes and postoperative complications.

Results. There were 29 men and 23 women. The median age was 62.9 years (range 30–85 years). Four patients had cirrhotic liver (3-Childs A and 1-Childs B). A total of 30% of patients (16 out of 53) had formal lobectomies or extended resections and 26% of patients (14 out of 53) had non-anatomical resections. The mean number of InLine RF Coagulator deployments was 3.4 (range 1–12) with a median coagulation time of 9.4 minutes (range 3–36 minutes). The mean intraoperative blood loss was 160 mls (range 5–675 ml) with a mean transection surface area of 63 cm² (range 7–232 cm²). The overall blood loss per transection surface area was 3.27 mls/cm² (range 0.14–12 mls/cm²). The median transection time was 27 minutes (range 2–129) with 11% of the transections requiring inflow occlusion (pringle maneuver). A total of 2% of the patients (1 out of 53) developed bile leaks requiring CT guided drainage. 11% of patients (6 out of 53) required CT guided drainage for non-bile intra-abdominal collections.

Conclusion. Based on our study, we have concluded that the InLine Radio Frequency Linear Coagulator is a safe and effective technique for liver resections which significantly aids in the reduction of blood loss, the rate of post operative bile leaks and transection time.