O-L04  Peri-operative thrombophilia in patients undergoing liver resection for colorectal metastases

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Background: The risk of major haemorrhage during liver surgery has decreased considerably in the modern era. However, there remains reluctance amongst liver surgeons to give routine peri-operative chemical thromboprophylaxis, either because of the perceived risk of bleeding, or transient post-operative abnormalities in conventional coagulation studies. The aim of this study was to ask whether a defined, homogeneous population of patients undergoing liver resection for colorectal metastases (CRM) were at risk from venous thromboembolism (VTE) prior to surgery, and what the impact of liver resection was on that risk.

Methods: A single-centre prospective observational cohort study comparing pre-, peri- and post-operative haemostasis variables in patients undergoing liver resection for CRM. Patients with cirrhosis, history of VTE or anticoagulated were excluded, as were patients undergoing small wedge, or laparoscopic liver resections. Blood samples for coagulation assays were collected pre-operatively, peri-operatively (after transection) and first post-operative day (13–20 hours post-operatively). Pre- and post-operative Tissue Factor messenger ribonucleic acid (TFmRNA) activation was measured from peripheral blood mononuclear cells (PBMCs) using semi-quantitative polymerase chain reaction (PCR). Patients received peri-operative mechanical thromboprophylaxis until mobile, plus chemical thromboprophylaxis on the first post-operative day, after venesection.

Results: Of 336 hepatectomies performed October 2017-December 2019, 60 resections in 57 patients were recruited. This included 46.7% major resections, with median (interquartile range [IQR]) blood loss 150.0mls (76.3-263.7), 79% no blood transfusions, post-operative VTE events or deaths. Patients were prothrombotic pre-operatively (high factor VIIIC and thrombin generation velocity index), an effect exacerbated post-hepatectomy. Major hepatectomies had a significantly greater drop in Protein C, rise in Factor VIIIC and von Willebrand Factor, versus minor resections (p = 0.001,0.005,0.001 respectively). Patients with transection times greater than median (40minutes), had significantly increased median (IQR) PMBC-TFmRNA expression [1.65 (0.93-2.70)2ddCt], versus quicker transections [0.99 (0.69-1.28)2ddCt, p = 0.020].

Conclusions: These data show the risk of major haemorrhage in elective liver resection in a high volume unit is low and administration of chemical thromboprophylaxis within 13-20 hours of surgery is safe and effective. The study demonstrates that patients with CRM are prothrombotic pre-operatively. Furthermore, this thrombophilia is exacerbated by liver resection, and most marked in patients with longer, more complex operations. These data suggest that chemical thromboprophylaxis should be considered earlier in the patient pathway, and has resulted in a change in practice for the authors.