



A novel liver parenchyma transection technique by the use of locking straight rigid ties – Experimental study on pigs

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Objectives

Technological advances led to the development of many devices used in liver resections. However, no single transection tool is uniformly accepted to be better than the others. This study aimed to develop an effective, safe, fast and cost-efficient technique of hepatic parenchymal transection.

Methods

A new liver parenchyma compression device in the form of a locking straight rigid tie (LoStRiT) was developed from scratch. Twelve pigs formed two groups. The control group (n = 6) comprised of animals that underwent hepatectomy using the standard Kelly-clysis technique. The study group (n = 6) comprised of animals that underwent hepatectomy using sequential LoStRiT mechanisms. Transection speed, blood loss and formation of bilomas were recorded.

Results

The mean parenchymal transection speed was 1.27 ± 0.27 cm²/min for the control group and 2.39 ± 0.56 cm²/min for the LoStRiT group (p = 0.003). The mean blood loss per kilogram of body weight was 9.8 ± 5.2 mL/kg for the control group and 3.9 ± 0.9 mL/kg for the LoStRiT group (p = 0.040). No bilomas were identified.

Conclusions

LoStRiT hepatectomy appears to be effective, safe, fast and reproducible in a porcine model of liver resection. Further development of this novel and potentially cost-efficient technique includes construction of the device with absorbable materials.