



## Commentary

# A commentary on “does Intermittent Pringle maneuver loss its clinical value in reducing bleeding during hepatectomy? A systematic review and meta-analysis” (Int J Surg, 2020; 81:158–164)



## ARTICLE INFO

## Keywords

Intermittent Pringle's maneuver  
Liver cancer  
Intraoperative blood loss  
Blood transfusion

Dear Editor

Hepatectomy is most commonly used to treat Liver cancers with curative intent. Massive bleeding remains a major problem. Although successful hepatectomy does not necessarily require blocking hepatic blood inflow to Liver, this maneuver is helpful in providing a relatively bloodless surgical field, with decreased intraoperative blood loss and operation time. Intermittent Pringle's maneuver (IPM) is commonly used to intermittently interrupt blood flow into the liver [1]. In hepatic resection. However, whether IPM is effective in reducing intraoperation blood loss is controversial [2,3]. Lin et al. [4] conducted a systematic review and meta-analysis to evaluate the clinical value of IPM in hepatectomy. They found that there were no significant differences between the IPM and non-IPM groups in intraoperative blood loss and incidences of intraoperative blood transfusion. In our view, this can be because of the use of effective modern haemostatic dissecting devices and improved technical skills. Furthermore, as massive bleeding during hepatectomy usually originates from major hepatic veins and their branches, inflow occlusion may not always offer help in controlling bleeding. Extrahepatic ligation of hepatic arteries and portal veins supplying the hemiliver about to be resected before parenchymal transection in major hepatectomy can also diminish the effect of IPM. Besides, with modern technologies and techniques, and without the time constraint imposed by application of inflow occlusion, surgeons can complete liver transection at their own paces, and are able to achieve meticulous haemostasis during liver transection. Also, bleeding during hepatectomy from hepatic veins can now be controlled using low central venous pressure. Our basic research studies showed IPM can potentially increase the risk of ischemia-reperfusion injury through the following mechanisms: 1) upregulation of vascular endothelial growth factor, 2) activation of hepatic stellate cells, 3) promotion of cell signaling associated with tumor cell adhesion, invasion, and migration, 4) delay damage to liver remnant.

Recently, we have employed the continuous half-Pringle maneuver (HPM) in segmentectomies or conventional non-anatomic liver resections with good results. The insertion of a vascular clamp in performing continuous Pringle in right-sided liver resections, an additional 5-mm port is placed 2 cm above the umbilicus at the anterior right

axillary line. For left-sided liver resections, a 5-mm port is inserted at the anterior left axillary line to insert a laparoscopic vascular clamp (Figs. 1 and 2). These procedures result in a visible ischemic-perfusion demarcation line along the main liver fissure. They techniques eliminate splanchnic congestion, reduce warm ischemia of remnant liver, and provide a relatively bloodless liver transection plan. It is feasible in left- and right-sided liver resections and is a useful tool for both open or laparoscopic liver resections. It can be included in the technical armamentarium of laparoscopic surgeons for use in selected patients.

## Provenance and peer review

Commentary, internally reviewed.

## Please state any conflicts of interest

We state there exists no conflict of interest.

## Please state any sources of funding for your research

None.

## Please state whether ethical approval was given, by whom and the relevant Judgement's reference number

No Ethical Approval was given.

## Research registration Unique Identifying Number (UIN)

Unique Identifying Number (UIN): None.

## If you are submitting an RCT, please state the trial registry number – ISRCTN

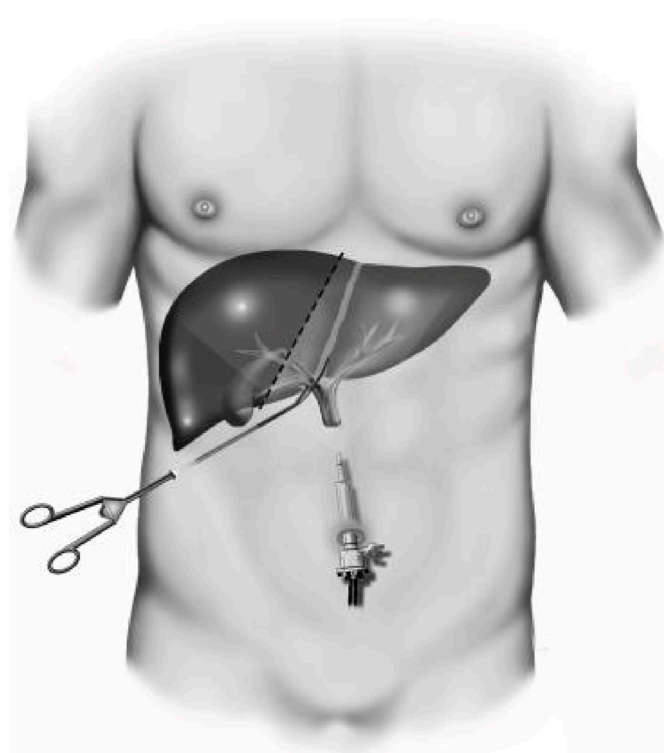
None.

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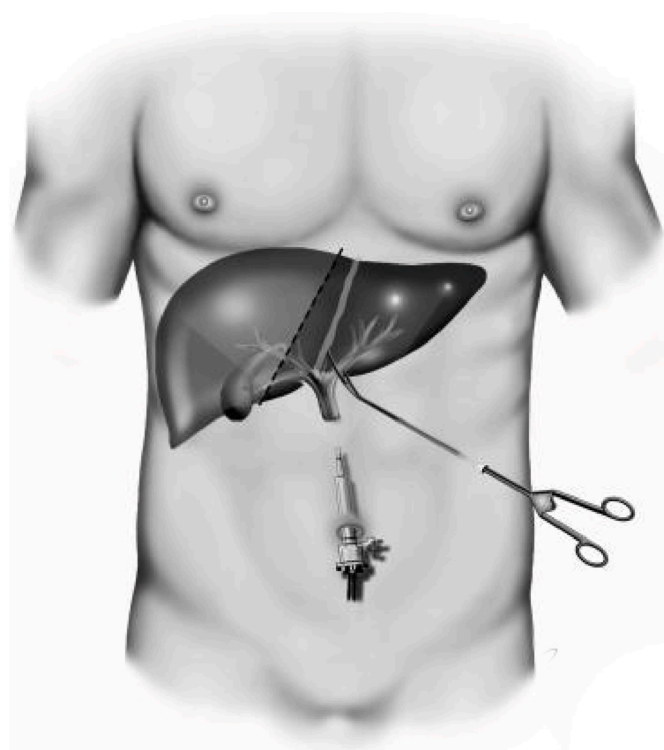
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**Fig. 1.** Insertion of the vascular clamp to perform the half-Pringle in right resections: An additional 5-mm port is placed 2 cm above the umbilicus at the anterior right axillar (schematic view).



**Fig. 2.** Insertion of the vascular clamp to perform the half-Pringle in left resections: An additional 5-mm port is placed 2 cm above the umbilicus at the anterior left axillar (schematic view).

## Author contribution

Writing-Yongtao Hu.  
Study design-Lianqing Lou.

## Guarantor

Lianqing Lou.

## References

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