The Pringle maneuver is well recognized as an effective procedure to control not only massive bleeding of the liver, but also for uncomfortable continuous bleeding during a liver transection (1), and this maneuver can thus contribute to the accurate identification of the cutting plane of the liver. A concern regarding the Pringle maneuver is ischemic damage to the liver, and we have demonstrated that the Pringle maneuver can also be applied for living donor hepatectomy with preservation of the function of a partial liver graft, even after reperfusion in the recipient (1).

The Pringle maneuver was originally introduced in open surgery for severe liver trauma (2), and many reports have shown its efficacy in laparoscopic and robotic hepatectomies as well. Unlike its use in open surgery, there are two different approaches for the Pringle maneuver in laparoscopic and robotic hepatectomies, i.e., as an intracorporeal (3) or extracorporeal (4-6) procedure. Lim et al. compared the extracorporeal and intracorporeal approaches of the Pringle maneuver and provided the details of the extracorporeal Pringle approach (7). They identified no significant differences in surgical results or postoperative complications between the extracorporeal and intracorporeal approaches, but they concluded that the extracorporeal approach is superior to the intracorporeal approach because it is easy, reproducible, quickly usable, effective, and safe and can be applied independently by an assistant surgeon during a laparoscopic or robotic liver resection. Additionally, the extracorporeal Pringle maneuver is easily applied by liver surgeons who are familiar with the ordinary open hepatectomy (7).

We completely agree with the statement by Lim et al., and we have applied the extracorporeal Pringle maneuver in our laparoscopic hepatectomy series. As Lim et al. noted, there are several options for the location of the trocar: the right flank (5,7,8), epigastrium (4), mid- or upper abdomen (6), and the left upper abdominal flank (9). In principle, our procedure is the same as that described by Lim et al., but we developed several minor modifications of their procedure. Lim et al. showed that possible disadvantages of the extracorporeal approach are the requirement of an additional port [with the creation of a small (1 cm) additional scar], and the risk of gas leakage.

To overcome these minor problems, we prefer to insert the tourniquet and trocar in the same scar. After placing the tape and tourniquet in the same manner as that described by Lim et al., we remove the trocar and reinsert it just along the tourniquet from the same scar. No extension of the scar is required, because we use a soft rubber tourniquet that is generally applied as a urinary catheter. With this procedure, we can place the tourniquet at any port where it was already placed without requiring an additional port. In regard to encircling the hepatoduodenal ligament, we use the Endo Mini-Retract™ laparoscopic retractor (Covidien Healthcare, Mansfield, MA) so that we can access the hepatoduodenal ligament from any angle, which eliminates the need for an additional port at the far right or left side in cases in which a grasper is used to encircle the hepatoduodenal ligament. We propose that
with these modifications, even the minor disadvantages of the extracorporeal Pringle maneuver compared to the intracorporeal approach can be overcome, as shown by Lim et al.

As Lim et al. also mentioned, although a randomized prospective study is necessary to elucidate the precise efficacy and feasibility of the extracorporeal approach for the Pringle maneuver, we recommend this technique as an easy and effective procedure to control bleeding during a laparoscopic or robotic hepatectomy.

Acknowledgements
None.

Footnote
Conflicts of Interest: The authors have no conflicts of interest to declare.

References

doi: 10.21037/ls.2018.08.03
Cite this article as: Takatsuki M, Soyama A, Eguchi S. The appropriate Pringle maneuver procedure in laparoscopic and robotic hepatectomies. Laparosc Surg 2018;2:38.