Asian Transplantation Week 2023
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Conrad Seoul, Korea
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Date & Time, Place : November 16 (Thu), 13:00-14:30, Room 3F-1
Session Title : The State of Art Video in minimally invasive donor hepatectomy

Interrelationship between laparoscoy and robotic donor liver resection

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Living donor liver transplantation (LDLT) has been established as an effective treatment for patients with end-stage liver disease or unresectable early - stage HCC, especially in Eastern countries where decease donors are relatively scare. The main concern for LDLT is that a healthy donor should be exposed to potential operative risks and inevitably have a large abdominal scar. Therefore, minimally invasive approaches have been attempted in donors to reduce an abdominal incision without compromising the donor safety. Laparoscopic donor hepatectomy has been attempted earlier than the robotic one and established as a standard approach in several expert centers. Robotic surgery has been originally developed for high complex laparoscopic procedures with overcoming the limitations of laparoscopic technology such as fulcrum effect and limited motion of instruments. Recently, the robotic donor hepatectomy has been emerging as the main modality of donor hepatectomy in some centers. In this lecture, I'd like deal with similarities and differences between laparoscopic and robotic donor hepatectomies.

Laparoscopic and robotic surgery have something in common. The most important similarities is that both surgeries are conducted in a closed abdomen, named a laparoscopic surgical field. Robotic surgery is just computer-aided laparoscopic surgery. Even though the liver donor surgery is a highly complex procedure, expert surgeons in either laparoscopic or robotic donor hepatectomy would provid the similar clinical outcomes. Recent meta-analysis also demonstrated that laparoscopic and robotic donor hepatectomy had the similar postoperative outcomes in both donor and recipients. Our initial study including 102 robotic and 69 laparoscopic donor right hepatectomies showed that robotic surgery had comparable postoperative outcomes for both donors and recipients than laparoscopic one.

Minimally invasive donor hepatectomy has a potential risk for a recipient procedure because loss of 2-3mm length of the vessel or bile duct is inevitable due to the application of a stapler or multiple clips to ligate them. Nevertheless, most of studies showed that minimally invasive donor hepatectomyies did not increase inflow and outflow vascular complications in recipients. This results may attributed to the fact that well-experienced team can overcome

the loss of vessel length during the donor operation. However, the loss of some length of the bile duct could result in multiple bile duct opening, which is the well-proven risk factor for recipient biliary complications. Some studies showed that laparoscopic donor hepatectomy had a higher biliary complication rate than the open approach. The robotic donor hepatectomy has the similar disadvantages for donor's bile duct division to the laparoscopic one, but it provide more clearer ICG cholangiogram and stable surgical field, which can provide more precise division of the donor bile duct than the laparoscopic one. Our recent updated data including 118 laparoscopic and 117 robotic donor hepatectomies showed that robotic donor hepatectomies provided lower biliary complication rate in recipients than the laparoscopic one with the similar outcomes in donor complications and recipient vascular complications.

In conclusion, laparoscopic and robotic donor hepatectomy have some in common because the operation is conducted in the laparoscopic surgical field. Some experience in each can decrease the learning curve of each approach and expert surgeion in each can provide the same clinical outcomes. However, the more precise division of the donor bile ducts of robotic surgery may produce less biliary complication in recipients than laparoscopic surgery. This result should be validated in other centers or well-designed prospective studies.