Editorial: Minimally Invasive Hepatobiliary and Pancreatic Surgery

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It is a great honor to present recent developments in hepatobiliary and pancreatic (HPB) surgery in the Juntendo Medical Journal.

HPB surgery includes a spectrum of challenging pathologies, requiring specialized multi-disciplinary management and technically challenging surgical procedures. Minimally invasive surgery has been recently introduced into the HPB field. This type of approach was first developed in 1987 for cholecystectomy, and has now become the standard technique for many surgical procedures. It is associated with more rapid patient recovery, less pain, less blood loss, and a shorter length of hospital stay. However, the adoption of laparoscopy in HPB has been relatively slow due to the complexity of the procedures and the need to develop new laparoscopy-compatible surgical instruments. More recently, the surgical robot (da Vinci®, Surgical Intuitive, CA) has also been introduced into the field, following its use in urology, gynecology, and other abdominal surgical fields. Although still restricted to a number of specialized units, and not yet covered by health insurance in Japan, it is gaining in popularity. In our experience of liver resection with the da Vinci Si (the latest model with dual console, Figures-1 and -2), the robot helps in performing the surgery more easily and with an increased level of safety. It includes three-dimensional vision, a magnified view of the operating field, surgical instruments with higher degrees of freedom, and the elimination of natural tremor (Figures-3 and -4). On average, patients were discharged in 10 days (6-10 days) with no major complications.

Pancreatic islet transplantation is a potential treatment for patients with type 1 diabetes. It can eliminate the need for insulin injections without risk of hypoglycemia. It represents a valuable alterna-

Figure 1 Dual surgeon’s console where the surgeon sits and operates the da Vinci.

Figure 2 Patient-side robotic cart with 4 arms manipulated by the surgeon.
To whole-organ pancreas transplantation. Although whole-organ transplantation is still more efficient with higher rates of insulin-independence, it also requires major surgery, with a greater risk of complications and even death. Conversely, pancreatic islet transplantation is a two-hour procedure under local anesthesia. The catheter is placed into the portal vein by the radiologist under ultrasound guidance, and the allogeneic islet cells are transplanted into the liver (Figure 5). It is especially indicated in patients with unidentified hypoglycemia, and can prevent the progression of diabetes problems, such as heart disease, kidney disease, and nerve or eye damage.

This issue is covered in four chapters in terms of recent advances of minimally invasive HPB surgery: (1) laparoscopic liver resection, (2) robotic liver resection, (3) laparoscopic and robotic pancreas resection, and (4) pancreatic islet transplantation. It illustrates the growing interest in these procedures, including the feasibility and safety of laparoscopic and robotic HPB surgery.

I am very thankful to Drs. Buchs and Toso from the University of Geneva, Switzerland, for sharing their expertise in robotic liver resection. It is also a great honor to include a contribution from Dr. Gala from the University of Alberta, Canada. The islet center at his university, directed by Dr. Shapiro, introduced the “Edmonton protocol” in 2000 with outstanding insulin-free rates after allogeneic islet transplantation, and is currently the largest in the world.

I hope this review article helps to promote minimally invasive HPB surgery further in Japan and beyond.

Acknowledgement

I would like to thank Dr. Isao Nagaoka for his encouragement and suggestions in preparing this manuscript.