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Case Report

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Robot-assisted spleen-preserving distal pancreatectomy in a 14-year-old patient with solid pseudopapillary neoplasm

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Abstract

Robotic pancreatic surgery in pediatric patients has been an area of debate due to safety and feasibility secondary to technical difficulties, such as decreased abdominal space and lack of experience. Herein, we report a 14-year-old male patient referred to our unit due to an incidentally detected pancreatic mass located in the tail of the pancreas. Preoperative radiological assessment revealed a solid pseudopapillary neoplasm, which was later confirmed by fine-needle aspiration biopsy. Robot-assisted spleen-preserving distal pancreatectomy (Kimura procedure) was performed using the da Vinci Xi robotic system. The operation lasted 4 h and 45 min without significant blood loss. The patient recovered without intensive care unit stay. Postoperative pancreatic fistula formation was not present, and the patient was discharged on the sixth postoperative day. Robotic pancreatic surgery can be safely performed in selected patient groups without any complications. A shorter convalescence period will result in shorter return to normal daily activities. Although initial reports present feasibility and safety, further studies must be conducted.

Keywords: Pediatric, robotic surgery, solid pseudopapillary neoplasm, spleen-preserving distal pancreatectomy.

Minimally invasive surgery in pediatric patients has been an area of conflict and uncertainty due to its technical difficulties, such as decreased abdominal space and feasibility. However, the development of robot-assisted surgery provided several advantages, such as increased dexterity and visualization of the abdomen, resulting in the reconsideration of robot-assisted surgery in pediatric patients.

Solid pseudopapillary neoplasm (SPN) is a low-grade malignant tumor of the pancreas that is usually observed in female patients in the third decade. Furthermore, SPNs are typically located in the corpus and tail portion of the pancreas. They constitute nearly 1 to 2% of pancreatic exocrine neoplasms.[1] Herein, we present a patient with SPN located in the tail of the pancreas treated with robot-assisted spleen-preserving distal pancreatectomy (Kimura procedure).

CASE REPORT

A 14-year-old male patient with a height of 172 cm and body weight of 53 kg was referred to our clinic due to an incidentally detected pancreatic tumor by abdominal ultrasonography during clinical assessment due to proteinuria. Preoperative tumor markers were within normal range. Preoperative computed tomography and magnetic resonance imaging showed a low-density lesion 15 mm in diameter in the body of the pancreas, which suggested SPN (Figures 1a, b). Fine-needle aspiration biopsy confirmed the diagnosis histologically. Robot-assisted spleen-preserving distal pancreatectomy using the da Vinci Xi system (Intuitive Surgical, Sunnyvale, CA, USA) was performed.

The patient was placed in reverse Trendelenburg position with a 15° right tilt. Furthermore, by using the Hasson technique, a 15-mm trocar was inserted

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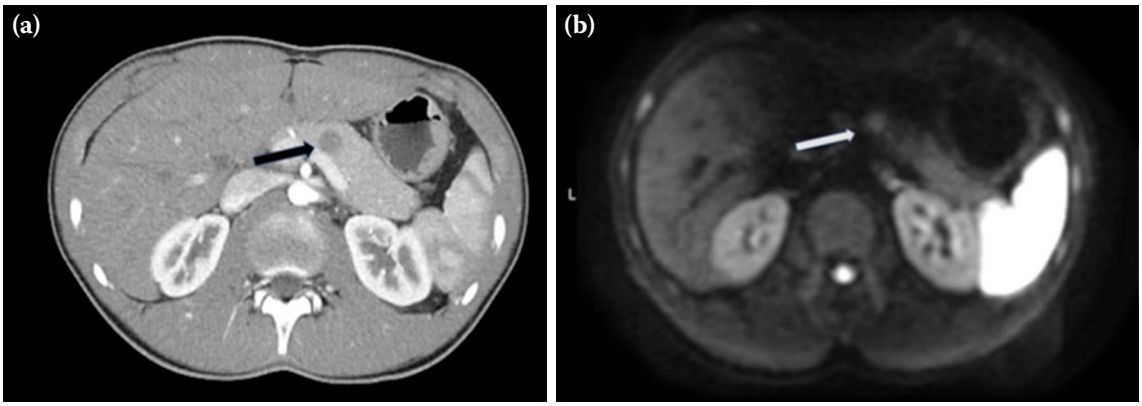

Figure 1. **(a)** Computed tomography section of the mass (shown with black arrow). **(b)** Magnetic resonance imaging section of the mass (shown with white arrow).

in the right iliac fossa, and four 8-mm trocars were placed at equal intervals in the horizontal line of the umbilicus. Due to the narrowing of the abdomen, the interval between each trocar was set to 6 cm (Figure 2). Pancreatic transection was performed by using an articulating Tri-Staple Endo GIA stapler (reinforced black cartridge; COVIDIEN, North Haven, CT, USA). A 19-Fr round Jackson-Pratt drain was placed adjacent to the pancreatic stump. The operation lasted 4 h and 45 min without significant blood loss. The patient recovered without intensive care unit stay. Postoperative drain amylase result showed no pancreatic fistula formation. On the fifth postoperative day, the pancreatic stump drain was removed, and the patient was discharged on the sixth postoperative day without any further complications. Pathological examination of the tumor revealed an SPN with CD10 positivity and CK-19 (cytokeratin 19), BCL-10 (B-cell lymphoma/leukemia 10), synaptophysin, and CGA (chromogranin A) negativity. Furthermore, the MIB-1 (mindbomb homolog 1) index of the tumor was 2% (Figure 3).

DISCUSSION

Malignant pancreatic tumors are extremely rare in pediatric patients. The most common are pancreatoblastoma and SPN.[2,3] Most of these patients present with vague abdominal pain. However, there is an important portion of asymptomatic patients,

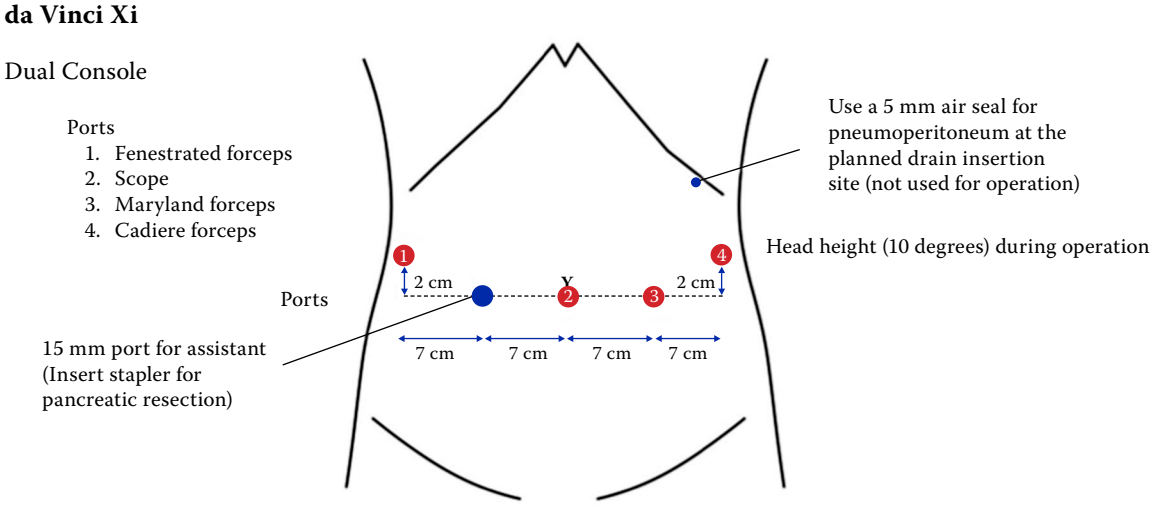

Figure 2. Port placements during the operation.

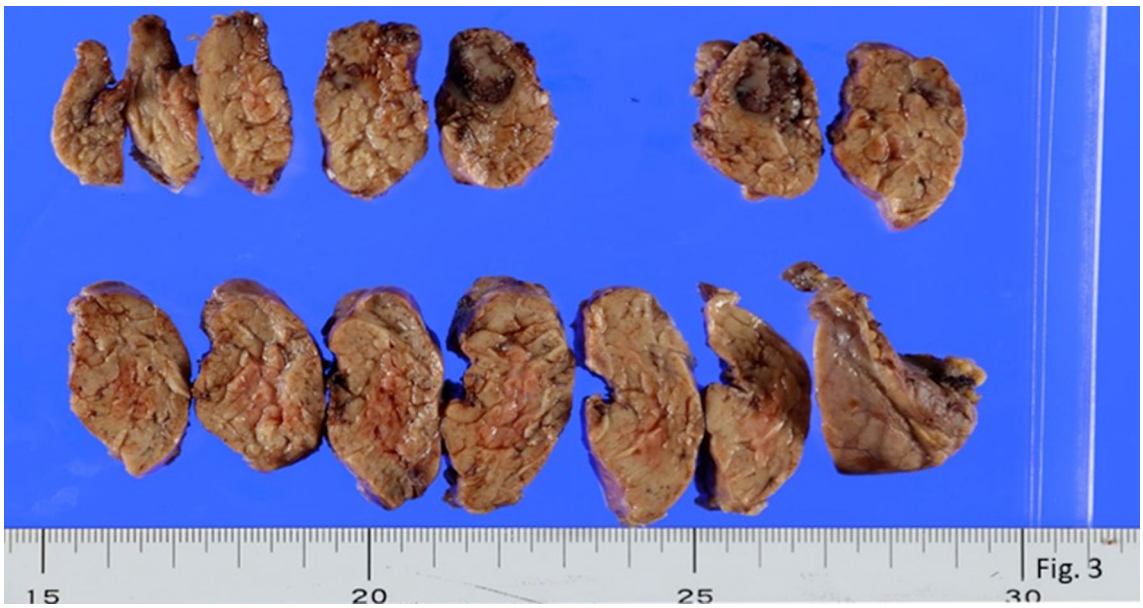

Figure 3. Gross pathological section of the mass.

such as the represented case.[4] On the other hand, SPN of the pancreas is rarer than pancreatoblastoma in the pediatric population, which is more prevalent among adult female patients in their third decade. Most of the SPNs are located in the corpus and tail of the pancreas, making it harder to present with an alerting symptom such as jaundice, which results in late diagnosis with an increased tumor diameter. The diagnosis is usually made by computed tomography and magnetic resonance imaging, with biopsy seldom used.[5]

Gold standard treatment of SPN is surgical resection, with a five-year survival rate of more than 95%.[6] With the usual location of the SPN being in the tail and corpus of the pancreas and the lack of need for reconstruction compared to their head-located counterparts, a minimally invasive approach is considered feasible. Furthermore, with the development of minimally invasive techniques and increased experience in pancreatic surgery, the convalescence period of these patients has become shorter and surgical outcomes have become better or comparable with their conventional counterparts.[7] However, there are still debates regarding feasibility of minimally invasive pancreatic surgery in pediatric patients due to lack of experience in this patient group and technical difficulties, such as decreased abdominal space. Recent reports by Hu et al.,[8] Nota et al.,[9] and Sergi et al.,[10] showed applicability of robotic surgery in pancreatic neoplasms cases in pediatric patients, even in malignant ones. Despite low experience in this patient group, initial reports are promising, and dedicated programs are intended to be established for this purpose.[11]

In conclusion, minimally invasive pancreatic surgery can be safely performed in selected pediatric patients without any complications. Despite the lack of experience in this patient group, the short convalescence period is a significant advantage. Nonetheless, although there are initial promising results, more extensive studies and training programs should be established for better outcomes.

Patient Consent for Publication: A written informed consent was obtained from the parent of the patient.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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