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Is the Robotic Assisted Hybrid Approach Increasing the MIS efficiency for Pancreaticoduodenectomy?

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Abstract

Introduction: Pancreaticoduodenectomy, commonly known as the Whipple procedure, is a complex surgical technique employed for the treatment of various pancreatic and periampullary pathologies. Minimally invasive PD was created in an attempt to enhance the outcomes of the traditional, open technique. However, the reconstruction phase has been recognized as a substantial barrier to widespread adoption of the laparoscopic technique. Several research appraisals and case studies recommend the robotic technique as a facilitator during the reconstruction steps. We propose a hybrid approach to combine the versatility of laparoscopy and the visual and motor advantages of the DaVinci Xi in order to maximize the precision of the reconstruction. Our suggestion is based on the experience that our institution has had with the standardization of different surgical procedures and protocols.

Methods: This article is focused on the outcomes of robotic assisted PD in our institution. Eleven patients underwent robotic assisted laparoscopic PD between 2020 and 2023 (N=11). There were two approaches involved: hybrid PD type A (N=6) and hybrid PD type B (N=5).

Results: Of the eleven patients who underwent hybrid PD, most of them were men (81.8%) and mean age was 61.9 years-old (range 45 to 75 years). The mean operative duration was 618 minutes (range 480 to 780 minutes). Mean blood loss was 159 mL (range 50 to 350 mL). Ten operations were performed for malignancy and one for neuroendocrine duodenal tumour; the mean number of lymph nodes retrieved was 16.2 (range 11 to 24 nodes) and all the specimens were reported by pathology as R0. Mean hospital stay was 18 days (range 8 to 40 days). Reoperations were necessary in five patients (N=5), all from the type A group, and mortality occurred in one (N=1) patient. There were no conversions to open surgery during the index procedures as well as no clinically relevant postoperative pancreatic fistulae. Thirty-day mortality was nil, with 1 mortality at 90-days due to massive pulmonary embolism.

Conclusions: The hybrid approach facilitates the advantages of both laparoscopic and robotic approaches. While laparoscopy is safer in manipulating the bowel and allows the Roux en Y reconstruction and gastro-pancreatic anastomosis, the robotic assistance enables the surgeon to perform delicate anastomosis with a high accuracy. The learning curve's most important element is standardization and careful patient selection along with a stepwise approach.

Cuvinte cheie: pancreaticoduodenectomy, minimal-invasive, robotic-assisted, hybrid, laparoscopy