

## What is the Best Minimally Invasive Surgical Options for Pancreatoduodenectomy?

### -Laparoscopic and robotic hybrid technique-

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Laparoscopic and robotic hybrid surgery has emerged as a new method of maintaining advantages and overcoming disadvantages of each method. Laparoscopic surgery has some merits such as quick movement of surgical instruments dependent by surgeon, several available energy or dissection devices, wider range of view, no resistance to open conversion due to economic barrier compared to robotic surgery. In a contrary, robotic surgery has strong points especially during anastomosis due to the free wrist movement with high degree of freedom, high magnification with 3D system, anti-tremor function. So our group adopted hybrid operation: resection by laparoscopy and anastomosis by robotic platform.

In this lecture, I will introduce our recent clinical results of hybrid PPPD comparing pure laparoscopic and robotic surgery.

Briefly speaking 40 patients underwent hybrid PD and 186 patients underwent open PD during same period. There was no significant difference between both groups in demographic findings except for higher BMI in the open groups ( $24.0 \pm 3.1$  vs  $22.6 \pm 2.6$ ,  $p=0.013$ ). Total hospital stay and postoperative stay was shorter in the hybrid group ( $11.8 \pm 4.9$  vs  $17.6 \pm 9.8$  days,  $p=0.000$  and  $10.4 \pm 5.0$  vs  $15.3 \pm 9.4$  days,  $p=0.000$ , respectively). In the open groups, proportion of firm or hard pancreatic texture was higher (38.2% vs 16.7%,  $p=0.022$ ), and pancreatic duct size was larger ( $3.3 \pm 2.2$  vs  $2.2 \pm 1.7$  mm,  $p=0.003$ ). Operation time was longer in the hybrid group ( $401.7 \pm 63.1$  vs  $330.1 \pm 91.8$  minutes,  $p=0.000$ ). There was no significant difference in complications including POPF rate between two groups ( $p=0.573$ )

Although it takes more time to operate, hybrid PD can shorten hospital stay and it is safe as open PD in terms of POPF. This hybrid techniques could provide many merits in regards to cost benefit, safety, etc.

I believe its use will be extended in near future.

