Is The Robotic Approach The Future of Distal Pancreatectomy with Splenectomy?

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Introduction

The Laparo-Endoscopic Single Site (LESS) approach has proven its cosmetic benefit. This study was undertaken to compare the application of the LESS vs. robotic approach for distal pancreatectomy and splenectomy utilizing propensity score matching (PSM).

Methods

With IRB approval, we prospectively followed 136 patients who underwent the LESS or robotic approach for distal pancreatectomy and splenectomy. 22 patients who underwent the LESS approach were matched with 22 patients who underwent the robotic approach. Patients were matched by cell type, tumor size, age, sex, and BMI. For illustrative purposes, the data are presented as median(mean±SD).

After PSM for Distal Pancreatectomy

Table 1: Demographics

Demographics	LESS	Robotic	p-value
Age(years)	66(64±10.5)	67(64±10.3)	p=NS#
Sex(W/M)	11W/11M	10W/12M	p=NS^
BMI(kg/m^2)	25(25±4.5)	25(25±4.2)	p=NS#
ASA class (I/II/III/IV)	0/7/15/0	1/6/14/1	p=NS¥

Table 2: Perioperative Variables

Perioperative variables	LESS	Robotic	p-value
Operative duration (min)	180(180±52.0)	248(262±78.5)	p=0.0002*#
Intraoperative complications (n)	Portal venotomy with venorrhaphy (1)	0	p=NS^
Conversions to 'open' (n)	7	2	p=NS^
Size of lesion (cm)	3(3±2.5)	2(3±2.2)	p=NS#
Margin status (R0/R1/R2)	19/3/0	20/2/0	p=NS^
EBL(mL)	200(317±394.4)	100(128±107.2)	p=0.04*#
Postoperative complications(n)	Pneumonia(2), Colonic leak(1), Respiratory distress(1)	Organ space SSI(1)	p=NS^
Clavien-Dindo classification(n)	II(2), IIIa(1), IVa(1)	II(1)	p=NS^
Length of stay (days)	4(7±5.5)	4(5±3.5)	p=NS#
30-day readmission (n)	5	4	p=NS^
In-hospital mortality(n)	0	0	p=NS^

NS (not significant), * significance is defined as p-value≤0.05,
^ Fisher's exact test # Student's T-test / Mann-Whitney U-Test,
¥ 4x2 contingency table

Results

When utilizing PSM, patients undergoing the LESS vs. robotic approach were 66(64±10.5) vs. 67(64±10.3) years-old (p=NS) with a BMI of 25(25±4.5) vs. 25(25±4.2) kg/m^2 (p=NS). There were seven (with LESS) vs. two (with robot) conversions to 'open' (p=NS); operative duration was 180(180±52.0) vs. 248(262±78.5) minutes (p=0.0002) and estimated blood loss (EBL) was 200(317±394.4) vs. 100(128±107.2) mL (p=0.04) The LESS approach had one intraoperative complication (i.e., portal venotomy with venorrhaphy due to abutment of the tumor on the portal vein) vs. zero for the robotic approach (p=NS). There were four patients with the LESS approach (e.g., pneumonia, colonic leak, respiratory insufficiency) vs. one patient with the robotic approach with postoperative complications (p=NS). With the LESS vs. the robotic approach, length of stay was 4(7±5.5) vs. 4(5±3.5) days (p=NS), there were five vs. four readmissions within 30 days (p=NS), and there were zero in-hospital mortalities (p=NS). The hospital cost of the LESS approach was $15,962(21,557±15,067) vs. $24,536(25,548±11,192) for the robotic approach (p=NS).

Conclusion

The robotic approach had a significantly lower EBL while the LESS approach had a shorter operative duration. Both approaches demonstrated similar salutary patient outcomes. We believe both should be adopted and situationally utilized.