Short-term Outcomes for Laparoscopic vs Robotic Distal Pancreatectomy and Duodenopancreatectomy:
A Study of the National Surgical Quality Improvement Program (NSQIP)

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Significance

Minimally invasive pancreatectomy has shown improved outcomes over open

Limited data on robotic vs laparoscopic pancreatectomy
- some studies: no difference
- some studies: worse robotic outcomes

Increasing utilization of robotic platform in many surgical procedures, including distal pancreatectomy and duodenopancreatectomy

Questions

How do perioperative outcomes differ between laparoscopic and robotic distal pancreatectomy?

How do perioperative outcomes differ between laparoscopic and robotic duodenopancreatectomy?

Inclusion Criteria

National Surgical Quality Improvement Project (NSQIP)

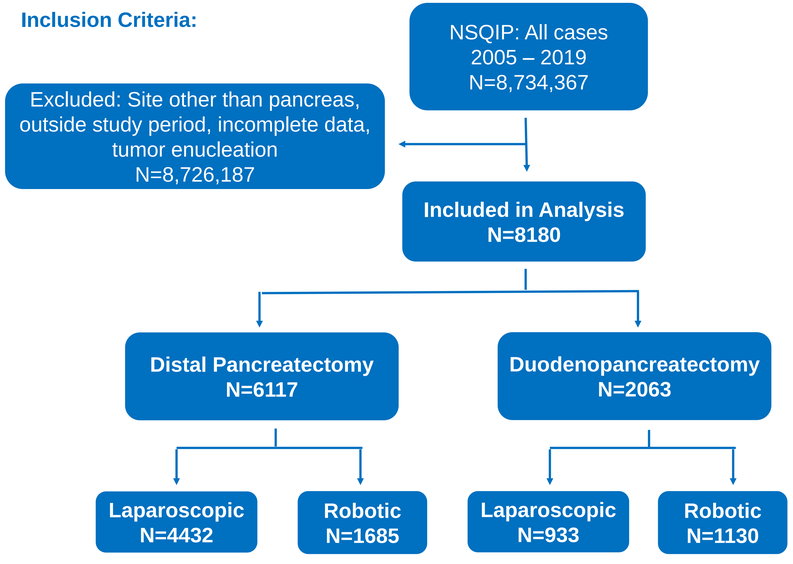
Minimally invasive pancreatectomy from 2014-2019

Exclusion Criteria

Tumor enucleation

Incomplete data

Inclusion Criteria:



Multivariate Outcomes Analysis: Distal Pancreatectomy

	Odds Ratio	Lower 95% CI	Upper 95% CI	P-value
Blood Transfusion	**0.692**	0.539	0.888	0.0038
Pancreatic Fistula	**1.478**	1.318	1.657	<.0001
Operative Time	**46.228***	51.476	40.977	<.0001

Odds ratio >1 indicates increased likelihood of outcome compared to Laparoscopic
*Operative Time is presented as a time estimate (in minutes), with estimate >0 indicating increased operative time compared to Laparoscopic

Multivariate Outcomes Analysis: Duodenopancreatectomy

	Odds Ratio	Lower 95% CI	Upper 95% CI	P-value
Blood Transfusion	**0.527**	0.403	0.690	<0.0001
Pancreatic Fistula	**1.684**	1.398	2.029	<.0001

Odds ratio >1 indicates increased likelihood of outcome compared to Laparoscopic

Patient Characteristics: Distal Pancreatectomy (all p < 0.05)

Race	Laparoscopic (n=4432)	Robotic (n=1685)
American Indian or Alaskan	19 (0.4%)	7 (0.4%)
Asian	214 (4.8%)	72 (4.3%)
Black or African American	410 (9.3%)	151 (9.0%)
Native Hawaiian or Pacific Islander	8 (0.2%)	7 (0.4%)
Unknown/Not Reported	634 (14.3%)	102 (6.1%)
White	**3147 (71.0%)**	**1346 (79.9%)**
Malignant Disease	2440 (55.1)	935 (55.5)
Chemotherapy within 90 days	**214 (4.8%)**	**127 (7.5%)**
Wound classification, n (%)		
1-Clean	**723 (16.3%)**	**215 (12.8%)**
2-Clean/Contaminated	**3439 (77.6%)**	**1340 (79.5%)**
3-Contaminated	**231 (5.2%)**	**120 (7.1%)**
4-Dirty/Infected	39 (0.9%)	10 (0.6%)

Patient Characteristics: Duodenopancreatectomy (all p < 0.05)

Race	Laparoscopic (n=933)	Robotic (n=1130)
American Indian or Alaskan	1 (0.1%)	2 (0.2%)
Asian	**60 (6.4%)**	**34 (3.0%)**
Black or African American	84 (9.0%)	93 (8.2%)
Native Hawaiian or Pacific Islander	3 (0.3%)	1 (0.1%)
Unknown/Not Reported	124 (13.3%)	79 (7.0%)
White	**661 (70.8%)**	**921 (81.5%)**
Chemotherapy within 90 days	**167 (17.9%)**	**270 (23.9%)**
Radiation Therapy within 90 Days	**74 (7.9%)**	**37 (3.3%)**
Wound classification, n (%)		
1-Clean	**36 (3.9%)**	**11 (1.0%)**
2-Clean/Contaminated	**767 (82.2%)**	**786 (69.6%)**
3-Contaminated	**119 (12.8%)**	**313 (27.7%)**
4-Dirty/Infected	11 (1.2%)	20 (1.8%)

Key Findings

Laparoscopic vs Robotic Distal Pancreatectomy

Robotic Distal Pancreatectomy:
- Increased utilization in white patients
- Increased neoadjuvant chemotherapy (7.5% vs 4.8%)
- Increased contaminated cases (7.1% vs 5.2%)
- Increased risk for pancreatic fistula (OR 1.478)
- Increased operative time (46 min)
- Decreased blood transfusion requirement (OR 0.692)

Laparoscopic vs Robotic Duodenopancreatectomy

Robotic Duodenopancreatectomy:
- Increased utilization in white patients
- Increased neoadjuvant chemotherapy (23.9% vs 17.9%)
- Decreased neoadjuvant radiation (3.3% vs 7.9%)
- Increased contaminated cases (27.7% vs 12.8%)
- Increased risk for pancreatic fistula (OR 1.684)
- Decreased blood transfusion requirement (OR 0.527)

Conclusions

Robotic surgery is increasing in prevalence
- More robotic duodenopancreatectomy than laparoscopic

Robotic distal pancreatectomy and duodenopancreatectomy are associated w/ increased rates of neoadjuvant chemotherapy and decreased need for blood transfusions but are also associated with increased rate of pancreatic fistulas.

Laparoscopic distal pancreatectomy shows more than 45 min improvement in operative time compared to robotic, with no similar difference seen in the duodenopancreatectomy cohorts.

Surgeons should choose the technique they feel most proficient utilizing