Advances in Minimally Invasive Surgery

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Advances in Minimally Invasive Surgery

No Disclosures
Advances in MIS: Lecture Objectives

1. An expanding toolbox for MIS pancreatic surgeons
2. The learning curve and patient selection
3. Perioperative complications - current evidence and controversy
4. MIS pancreatic surgery, population health, and health economics.
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An expanding toolbox: The scope of the problem

- The incidence of pancreatic cancer is on the rise with the indications for surgery expanding alongside improved systemic therapies.

SEER Cancer Stat Facts: Pancreatic Cancer
An expanding toolbox: The scope of the problem

- Nearly four in 10 patients are diagnosed with disease confined to the locoregional structures
- Clinically corresponding to: (1) resectable, (2) borderline resectable, or (3) locally advanced disease
An expanding toolbox: The scope of the problem

5-Year Survival

Percent Surviving

Year


SEER Cancer Stat Facts: Pancreatic Cancer
An expanding toolbox: The scope of the problem

- Surgery is associated with a survival advantage even in patients with locally advanced disease

An expanding toolbox: The scope of the problem

- In keeping with findings from other cancer subtypes, earlier disease stages are associated with improved survival.
An expanding toolbox: Technologies available for use today

• Conventional laparoscopy
• 3-D laparoscopy
• Robotics
• Advanced stapling and energy devices
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The learning curve: Lessons from prior experience

- The adoption of new technology requires:
  1. Introductory training
  2. Intentional practice
  3. Graduated introduction
  4. Diligent recognition of changes in practice and outcomes

Hua et al. Surgery 2017
Patient selection: Build experience with appropriate cases

- Distal pancreatectomy as an example for uncomplicated, often premalignant, disease
- The use of hybrid procedures
- Incremental growth occurs with selection of more complicated procedures
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Perioperative complications:
The need to control major vasculature
Perioperative complications:

- Estimated blood loss:

<table>
<thead>
<tr>
<th>Minimally Invasive Distal Pancreatectomy (n = 51)</th>
<th>Open Distal Pancreatectomy (n = 57)</th>
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  \[
P < 0.001
\]

de Rooij et al. Ann Surg 2019
Perioperative complications: Reconstruction quality drives outcomes
Perioperative complications:

- Estimated blood loss:

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  \[ P \lesssim 0.001 \]

- Pancreatic fistula:

  ![Graph showing fistula rates over years with significance values.]

  de Rooij et al. Ann Surg 2019
  Panni et al. JACS 2019
Perioperative complications:

- Estimated blood loss:
  - Minimally Invasive Distal Pancreatectomy (n = 51):
    - 150 (50–350)
  - Open Distal Pancreatectomy (n = 57):
    - 400 (200–775)
  - $P < 0.001$

- Pancreatic fistula:

- Overall complications:
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Population health and health economics:

- Hospital factors that drive or slow adoption
- Health economics and costs of care
- Generalization of techniques and globalization

Stewart et al. Surgery 2019
Two more honest thoughts (amongst friends)
Is this just a party trick?
i.e. complicated anatomy and oncologic adequacy of resection
“The size of the incision is the least important part of the operation”
Perioperative stress, the immune response, and cancer recurrence:

- The incorporation of MIS techniques has the potential to, not only meet oncologic equivalency, but surpass them.

Kooby et al. JACS 2010
Perioperative stress, the immune response, and cancer recurrence:

- The incorporation of MIS techniques has the potential to, not only meet oncologic equivalency, but surpass them.

Pommier et al. Science 2018
Advances in MIS for PancreasFest 2019:

1. An expanding toolbox allows for complex MIS pancreatic surgery to performed safely

2. Patient selection is critical in the early adoption of MIS technologies

3. Perioperative complications are (at least) equivalent when implemented by high-volume surgeons and programs with experience in both pancreatic and MIS

4. Costs appear reasonable but resource utilization may limit universal adoption of techniques