Hot Issues and Trends in Surgical Oncology

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Objectives

- Describe the evolution of surgical and interventional procedures
- Describe the role of surgery in cancer care
- Describe recent trends in surgical oncology

Historical Perspective

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Surgical Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Procedure</th>
<th>Surgeons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1809</td>
<td>Excision of ovarian tumor</td>
<td>McDowell</td>
</tr>
<tr>
<td>1846</td>
<td>Excision of submaxillary gland</td>
<td>Warren</td>
</tr>
<tr>
<td>1867</td>
<td>Antisepsis</td>
<td>Lister</td>
</tr>
<tr>
<td>1881</td>
<td>Gastrectomy</td>
<td>Billroth</td>
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<tr>
<td>1890</td>
<td>Mastectomy</td>
<td>Halsted</td>
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<tr>
<td>1908</td>
<td>Abdominoperineal resection</td>
<td>Miles</td>
</tr>
<tr>
<td>1920s</td>
<td>Brain tumor surgeries</td>
<td>Cushing</td>
</tr>
<tr>
<td>1935</td>
<td>Pancreaticoduodenectomy</td>
<td>Whipple</td>
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</tbody>
</table>

General Anesthesia

- 1845 - Horace Wells (dentist)
- Nitrous Oxide - Harvard Medical School
- Failed public demonstration

- 1846 - William Morton & Crawford Long
- Ether – Massachusetts General Hospital
- Exc. submaxillary gland

Dr. Joseph Lister

Father of aseptic surgery
Dr. C.A. Theodor Billroth
Father of GI surgery

Dr. William S. Halstead
Formalized surgical training

American Oncologic Hospital

Oncology Nurses 1904

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Preemptive Procedures
- Mastectomy
- Oopherectomy
- Colectomy
- Endoscopic mucousal resection
- Endoscopic polypectomy
- Endoscopic anti-reflux procedures
- Routine skin surveillance with lesion removal

Monitoring
- Second-look laparoscopy
- Follow-up endoscopy
- L.I.F.E.
- EUS

Palliative
- Tumor debulking
- PEG tube insertion
- Brachytherapy
- Image-guided nerve block
- Endoscopic celiac plexus block
- Diverting ostomy
- Stents

Minimally Invasive/minimal Access Surgery
- Laparoscopy
- Thoracoscopy
- Mediastinoscopy
- Cystoscopy
- Arthroscopy
- Colonoscopy
- EGD
- ERCP

Minimal Access Procedures: cancer management benefits
- Less immune suppression than open techniques
- Less postoperative pain
- Reduced analgesia needs
- Rapid return of GI function
- Adjunct to preop staging
- Application of chemotherapy and brachytherapy

Laparoscopic Surgery Associated with Reduced Inflammatory response
- 35 Laparoscopic vs. 35 Open Colectomies
- Blood samples preop & 1, 3, & 5 postop days
- Open surgery = increased CRP & IL-6
- Laparoscopic = increased NK cells
- Less immune suppression = less postop complications

Minimal Access Procedures: potential drawbacks in cancer management

- Less capacity for intra-abdominal inspection and large specimen removal
- Potential for port-site recurrence
- Potential for DVT from pneumoperitoneum
- Risk for pleural or peritoneal seeding

Microsurgery
- Free tissue transfer graft
- Fine tissue dissection
- Micro nerve and vascular anastomoses

Directed-Energy Modalities
- Electrosurgery
- Argon-enhanced coagulation
- LASERS
- Ultrasonic dissection
- Thermal ablation
- RFA
- IORT
- Cryo surgery

Interventional Radiology
- Chemo embolization
- RFA
- Micro sphere radiation injection
- Image-guided procedures

Interventional Endoscopy
- Mucousal resection
- Variceal ligation
- Colon polypectomy
- Stenting
- Sphincterotomy
- Photodynamic ablation

Dazzling technological advances!
- High-resolution video imaging
- Magnification endoscopy
- Chromoendoscopy
- Small-caliber endoscopy
- Optical adherence tomography
- Fluorescence
- Virtual Reality Surgical Simulation
Virtual Reality Surgery
- Hand-assist Lap-assist Colectomy

Stents (SEMS)
- Indications
- Endoscopic deployment
- Complications
- Drug-eluding
- Bioabsorbable

Gastrointestinal surgery
- Esophageal
- Gastric
- Intestinal
- Colorectal
- Endoluminal surgery

Laparoscopic Colectomy equivalent to Open Colectomy in Cancer Related Survival for Curable Cancer
- Clinical Outcomes of Surgical Therapy Study Group (COST Trial)
- NEJM. 350: 20, 2004

COST Trial
- Prospective, randomized, multi-institution trial comparing lap-assisted & open colectomy for Colon cancer
- 66 surgeons at 48 institutions
- 863 patients
- Primary end point: time to tumor recurrence
- Secondary end point: disease free & overall survival, complications, QOL

Peritoneal Surface Malignancies
- Pseudomyxoma peritonei syndrome
- Peritoneal mesothelioma
- Peritoneal carcinomatosis
Peritoneectomy
- Cytoreduction
- Visceral/parietal stripping

Hepatobiliary
- Pancreatic
- Liver
- Biliary
- Economic impact

Head and Neck
- Thyroid/Parathyroid
- Laryngeal
- Oropharyngeal
- Skull Base
- ENT

Plastic/Reconstructive
- Implants
- Flaps
- Grafts
- Creative use of geometry
  - Nipple reconstruction
  - Z – plasty
  - Naso-labial flaps

BREAST
- Stereotactic Biopsy
- Sentinel Lymph Node Mapping
Stereotactic Imaging Table

* Abnormal tissue is located
* Local anesthetic is administered
* Computer imaging system guides probe into the breast
* Vacuum system draws tissue into the sample chamber for pathology
* Images are taken to ensure all suspicious tissue has been removed
* Needle is removed, pressure applied, and bandaid dressing is placed

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BREAST
- Breast Conservation Surgery
- Skin Sparing Mastectomy
- Brachytherapy (Mamosite™)

GYNECOLOGY
- Endometrial
- Ovarian
- Cervical
- Vulvar
**GYNECOLOGY**
- Pelvic exenteration

**Intraperitoneal Hyperthermic Chemotherapy**
- Indications
- Procedure
- Agents
- Research
  - Occupational health issues

**NEURO SURGERY**
- Stereotactic Guided Biopsy
- Brain metastases

**Stereotactic Frame**
*Image Not Available*

**ORTHOPEDICS**
- Osteogenic sarcoma
- Ewing’s sarcoma tumors
- Osseous metastases

**ORTHOPEDICS**
- Aggressive surgical intervention
  - Endoprosthetics
  - Internal fixation
  - Cementoplasty/vertebroplasty
- Palliative Care
THORACIC

- Mini-thoracotomy
- VATS
- Mediastinoscopy
**Robotics**

- Robotic arm
- Voice-activated controls
- Remote surgical manipulator
- Potential use with telesurgery
- Enhanced dexterity

**Herbal Supplements: Implications for Surgery**

- Pre-operative Screening
- Herbals effect on:
  - Coagulation
  - Cortiosteroids
  - CNS
  - GI
Surgical oncology has evolved from being the only treatment modality for cancer, to being one essential component in the multimodality approach to the management of patients with solid tumors.

Future Forecast……. Issues

- Increasing population of people 65 and older
- Continued advancements in science and technology
- Biological therapies
- Restructuring of healthcare workforce culture
- Patient safety initiatives
- Reimbursement……?

Questions?

- Thank you, Chris and Denise