Handling the Laparoscopic and Robotic Problems in the Surgical Obese Patient

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Surgical Tutorial 6:  
Handling the Laparoscopic and Robotic Problems in the Obese Surgical Patient

Faculty: William M. Burke and Antonio R. Gargiulo  
Moderator: Donald L. Chatman

Course Description

With the ever-growing obesity epidemic, developing surgical skills that are required to safely perform minimally-invasive surgery is paramount. This course will describe techniques of safe patient positioning with a focus on prevention of brachial plexus and femoral nerve injury; safe abdominal entry; variability in abdominal wall anatomy and subsequent port placement; effective tissue retraction tips, and advice regarding special laparoscopic instrumentation for obese women. Specific anesthesia-related concerns regarding ventilation will also be discussed.

Learning Objectives

At the conclusion of this course, the participant will be able to: 1) Describe variability in abdominal wall anatomy between thin and obese women; 2) discuss specific positioning requirements for obese women to prevent nerve injury; 3) describe optimal selection of laparoscopic ports and instruments for obese women; and 4) discuss the utility of maximizing use of avascular pelvic spaces in obese women.
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The following members of AAGL have been involved in the educational planning of this workshop and have no conflict of interest to disclose (in alphabetical order by last name).
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The following have agreed to provide verbal disclosure of their relationships prior to their presentations. They have also agreed to support their presentations and clinical recommendations with the “best available evidence” from medical literature (in alphabetical order by last name).
William M. Burke*
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Asterisk (*) denotes no financial relationships to disclose.
Handling the Laparoscopic and Robotic Problems in the Surgical Obese Patient

Safe Entry, Positioning, Tissue Retraction, Trocar Placement, Instruments, and Surgical Pearls

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Objectives
- Review important anatomy related to peritoneal access
- Review important aspects of obtaining pneumoperitoneum.
- Become familiar with different peritoneal access devices
- To learn basic trocar placement for conventional and robotic-assisted laparoscopy
- Review the medical and surgical risks associated with obesity
- Learn how to pre-operatively evaluate the obese gynecologic patient
- Become familiar with ways to avoid the surgical complications associated with the obese patient

Introduction
- Laparoscopy offers an alternative approach to the surgical treatment for most gynecologic pathology.
- Complex gynecologic laparoscopic procedures have become the standard of care.

Minimally Invasive Gynecologic Surgeons
- General Gynecologists
- Gynecologic Oncologists
- Reproductive Endocrinologists
- Urogynecologists
- Chronic pelvic pain/Endometriosis Specialists

Changing Patient Characteristics
- Older
- Sicker
- Surgically more complex
- Heavier

Disclosures
Antonio R. Gargiulo, M.D.
- I have no financial relationships to disclose.

William M. Burke, M.D.
- I have no financial relationships to disclose.
**Challenges**

- Medical risks
- Obesity
- Abdominal entry
- Adhesions
- Large pelvic masses
- Uterine manipulation

**Obesity in the United States**

- The prevalence of obesity in the United States over the past 20 years has risen dramatically
- An estimated 97 million adults age 20 and over in the U.S. are overweight or obese
- Similar trends are being seen among children


**Obesity in the United States**

- Age adjusted prevalence of obesity in adult women aged 20 to 74 years in 2007 to 2008 was 35.5%
- More than 64.1% of all adult women are considered either overweight or obese
- The WHO has argued that obesity is one of the most blatantly obvious yet most neglected world health problems and is one of the most common causes of ill health worldwide


**Health Risks**

- Hypertension
- Dyslipidemia
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (endometrial, breast, and colon)
- Venous thromboembolism

**Obesity In The United States 2004**

- [www.cdc.gov/nccdphp/dnpa/obesity/index.htm](http://www.cdc.gov/nccdphp/dnpa/obesity/index.htm)

**Gynecologic Impact of Obesity**

- Early onset puberty/menstrual irregularities
- POS/ovulatory dysfunction
- Poor response to fertility treatments
- Increase risk of pelvic organ prolapse
- Increase risk of stress urinary incontinence
- Increased risk of endometrial polyps
- Greater association with symptomatic fibroids
- Increased risk of endometrial hyperplasia and cancer

Complications of Laparoscopic Access

- Bleeding from the anterior abdominal wall
- Vascular injury to the abdominal and pelvic vessels
- Bowel injury
- Bladder Injury
- Port site herniation

Considerations

- Procedure
- Patient body habitus
- Prior surgical history
- Potential complications

Initial Entry

- Open laparoscopy
- Closed technique with insufflation
- Closed technique with insufflation and direct visual entry
- Closed technique with direct trocar placement
**Insufflation**

- The usual site for the insertion of the insufflation needle is the umbilicus where the abdominal wall is the thinnest.

**Veress Placement**

**Which point of entry would you use in patients with a history of prior abdominal surgery?**

- 1. Umbilicus
- 2. Right upper quadrant
- 3. Left 10th intercostal space
- 4. Transvaginal
- 5. Transfundal
- 6. Palmer’s point

**Alternate Insufflation Sites**

- Left upper quadrant
- Transvaginal
- Transfundal

**Left Upper Quadrant Entry**

- Left upper quadrant
  - Midclavicular line beneath left costal margin (can insufflate between ribs 9 & 10)
  - Check for hepatosplenomegaly; Hx of surgery in LUQ
  - Decompress stomach

**Palmer’s Point**

Palmer’s point is 3 cm below the left costal margin in the midclavicular line.

The insufflation needle is inserted at a steep 60 to 80 degree angle and slightly toward the midline.
Other Entry Points

Trocar Selection

Trocar Properties

Preparation for Trocar Placement
- Gastric decompression
  - Should have been confirmed prior to insufflation
- Proper insufflation pressure achieved
- Ensure that the patient is flat and not in Trendelenburg
- Grasp trocar to limit insertion distance

Trocar Placement
- Start with the umbilical port placement.
- Use spinal needles as finders to guide proper placement of the remaining trocars
- Adjust for the pannus when trying to place your trocars based on the usual anatomic landmarks.
- Think about placing the ports more laterally as this will often give you more exposure and decrease the torque on the ports.

Robotic Port Placement
Rationale

- Any surgery in obese patients is technically more difficult
- Postoperatively obese patients have an increased risk of atelectasis, pneumonia, DVT, PE, ileus, and wound infection
- All the above risks have also been shown to be increased with more extensive laparotomy procedures
- Laparoscopy provides surgeons with surgical technique capable of overcoming many of the challenges posed by the obese patient, without compromising surgical outcomes, and often significantly reducing operative and perioperative morbidity

Feasibility of Laparoscopy in The Obese Gynecologic Patient

- 42 women with clinical stage I endometrial cancer and a body mass index (BMI) of 28.0 or greater who were offered laparoscopic staging were compared with a group of matched controls who underwent abdominal procedures during the same time period.
- The mean BMI for all patients was 35.8, but conversion to laparotomy occurred in only 7.5% of patients.
- There was no difference in surgical complications, total cost per case, postoperative pain perception, or patient satisfaction.
- Women undergoing laparoscopy had a greater number of lymph nodes retrieved, smaller changes in postoperative hematocrit, decreased pain medication requirements, and shorter hospital stays, but operative time was significantly longer.

Patient Selection

Is there a weight limit for utilizing the laparoscopic approach in obese women?

1. 150 to 225 lbs.
2. 225 to 275 lbs.
3. 275 to 325 lbs.
4. It depends
5. I don’t operate on obese patients.
Assessment of Obesity

- Waist/hip ratio
  - Positively correlated with fat distribution

- Very important for evaluating the overall feasibility of performing laparoscopic case on certain patients

- A WHR exceeding 0.85 indicates an android distribution or abdominal obesity.

- Patients with an android distribution may be more problematic to operate on

BMI: 38.6
Obesity classification II
WHR < 0.85
Laparoscopy feasible.

BMI: 37.6
Obesity classification II
WHR > 0.85
Laparoscopic Challenge.

Anesthesia Risks in the Obese Patient

- Technical difficulty of surgery on obese patients is greater no matter what the procedure and may require longer anesthetic time.

- Higher risk of airway obstruction and difficult intubation

- Anesthesia induction, maintenance of sedation, and reversal can all be more problematic

Positioning

- Obese patients are at a greater risk of pressure sores and neural injuries!

- Using the right equipment and ensuring proper positioning will help avoid neural injuries in obese patients.

Leg Position: The Ultrafins®

Shoulder Braces
**Arm Placement and Protection**

**Final Proper Positioning**

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**The Challenge of Pneumoperitoneum in the Obese Patient**

- Decreased surgical landmarks for placement of the Veress needle
- Limited length of Veress needles
- Elevated initial intra-abdominal pressures
- Inadequate abdominal distension at normal insufflation pressures

**Solutions**

- Use a long (150 mm) Veress Needle
- Grasp umbilicus with towel hooks
- Assure that you enter the belly perpendicular to the skin in a slightly cephalad direction
- Consider a left upper quadrant
- Consider vaginal placement of Veress in women with no risk for pelvic adhesive disease

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**FIGURE 2.** Schematic of proper Veress needle placement in obese patients.

**Left Upper Quadrant Entry**

- Left upper quadrant (3-5 mm laparoscope)
  - Midclavicular line beneath left costal margin (can insufflate between ribs 9 & 10)
  - Check for hepatosplenomegaly, Hx of surgery in LUQ
  - Decompress stomach

**The challenge of port placement in the obese patient**

- Inadequate length of normal laparoscopic trocars
- Decreased landmarks for the proper placement of trocars
- Inadequate pneumoperitoneum for the safe placement of trocars

**Trocar Selection**

- Use long trocars (15cm)
- Consider using blunt tipped, radial dilating trocars

**Trocar Placement**

- Start with the umbilical port placement.
- Use spinal needles as finders to guide proper placement of the remaining trocars
- Adjust for the pannus when trying to place your trocars based on the usual anatomic landmarks
- Think about placing the ports more laterally as this will often give you more exposure and decrease the torque on the ports.
Instrument Selection

Uterine Manipulation
- ZUMI
- RUMI System

Trocar Site Closure
- Endoclose
- Carter-Thomason XL
- Veress needle
- Urologic needles

Carter-Thomason XL Closure Device

Summary
- Obesity is a problem all gynecologic surgeons will continue to face in the United States
- Laparoscopic surgery is feasible and safe in obese patients
- Patient selection based on weight distribution and other medical issues is paramount
- Proper positioning and equipment selection is essential
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Coaxial Single Incision Robotic Surgery and Infrapannicular Robotic Surgery

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Obesity and Infertility

- Female factor
  - Chronic anovulation
  - Mechanical factors
  - Decreases ART success (decreased oocyte quality)
  - Spontaneous miscarriage

- Male factor
  - Hypotestosteronemia
  - Abnormal spermatogenesis
  - Erectile dysfunction
  - Mechanical factors


Robot-Assisted Reproductive Surgery in the Obese Patient

Cultural and Linguistic Competency

Governor Arnold Schwarzenegger signed into law AB 1195 (eff. 7/1/06) requiring local CME providers, such as the AAGL, to assist in enhancing the cultural and linguistic competency of California’s physicians (researchers and doctors without patient contact are exempt). This mandate follows the federal Civil Rights Act of 1964, Executive Order 13166 (2000) and the Dymally-Alatorre Bilingual Services Act (1973), all of which recognize, as confirmed by the US Census Bureau, that substantial numbers of patients possess limited English proficiency (LEP).

California Business & Professions Code §2190.1(c)(3) requires a review and explanation of the laws identified above so as to fulfill AAGL’s obligations pursuant to California law. Additional guidance is provided by the Institute for Medical Quality at http://www.imq.org

Title VI of the Civil Rights Act of 1964 prohibits recipients of federal financial assistance from discriminating against or otherwise excluding individuals on the basis of race, color, or national origin in any of their activities. In 1974, the US Supreme Court recognized LEP individuals as potential victims of national origin discrimination. In all situations, federal agencies are required to assess the number or proportion of LEP individuals in the eligible service population, the frequency with which they come into contact with the program, the importance of the services, and the resources available to the recipient, including the mix of oral and written language services. Additional details may be found in the Department of Justice Policy Guidance Document: Enforcement of Title VI of the Civil Rights Act of 1964 http://www.usdoj.gov/crt/cor/pubs.htm.

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency”, signed by the President on August 11, 2000 http://www.usdoj.gov/crt/cor/13166.htm was the genesis of the Guidance Document mentioned above. The Executive Order requires all federal agencies, including those which provide federal financial assistance, to examine the services they provide, identify any need for services to LEP individuals, and develop and implement a system to provide those services so LEP persons can have meaningful access.

Dymally-Alatorre Bilingual Services Act (California Government Code §7290 et seq.) requires every California state agency which either provides information to, or has contact with, the public to provide bilingual interpreters as well as translated materials explaining those services whenever the local agency serves LEP members of a group whose numbers exceed 5% of the general population.

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If you add staff to assist with LEP patients, confirm their translation skills, not just their language skills. A 2007 Northern California study from Sutter Health confirmed that being bilingual does not guarantee competence as a medical interpreter. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538.