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## Table of Contents

Course Description ........................................................................................................................................ 1  
Disclosure ...................................................................................................................................................... 2  

The Art and Practice of Expert Surgical Dissection  
J.B. Long ........................................................................................................................................................ 3  

The Education and Process of Becoming a Competent Surgeon  
R.M. Rogers ................................................................................................................................................... 8  

Anatomy of the Anterior Pelvic Spaces  
G. Favero ....................................................................................................................................................... 13  

Anatomy of the Posterior Pelvic Spaces  
N.A. Goldman ............................................................................................................................................... 17  

Cultural and Linguistics Competency ........................................................................................................... 19
ANAT-702

Robert M. Rogers, Chair
John F. Boggess, Co-Chair

Faculty: Giovanni Favero, Noah A. Goldman, Jaime B. Long

A competent surgeon is characterized by having a working knowledge of the retroperitoneal anatomy with expert skills of surgical dissection. A lack of understanding the anatomy in this region is often cited as the gynecologic surgeon’s Achilles’ heel, increasing the risk of complications. Optimal surgical results cannot be achieved without developing a high level of surgical skill.

This course will explain how to organize pelvic retroperitoneal anatomy, and the anatomic structures contained in this area. It also will include specific techniques and patterns of surgical dissection. Practical clinical instruction will be provided through the use of vignettes, as well as a live interactive cadaveric demonstration.

Learning Objectives: At the conclusion of this course, the clinician will be able to: 1) Use the learning process to tackle complex pelvic and retroperitoneal pathology; 2) safely dissect the retroperitoneal anatomic regions and spaces in the female pelvis; 3) identify the anatomic regions and spaces; and 4) identify the anatomic structures contained within these anatomic regions and spaces.

Course Outline

7:00  Welcome, Introductions and Course Overview  R.M. Rogers
7:05  The Art and Practice of Expert Surgical Dissection  J.B. Long
7:30  The Education and Process of Becoming a Competent Surgeon  R.M. Rogers
7:55  Live Interactive Cadaveric Demonstration: Anatomy of the Female Pelvis  J.F. Boggess
8:45  Questions & Answers  All Faculty
8:55  Break
9:10  Anatomy of the Anterior Pelvic Spaces  G. Favero
9:35  Anatomy of the Posterior Pelvic Spaces  N.A. Goldman
10:00  Questions & Answers  All Faculty
11:00  Adjourn
PLANNER DISCLOSURE
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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Jaime B. Long*
Robert M. Rogers
Speakers Bureau: Cook Medical

Asterisk (*) denotes no financial relationships to disclose.
The Art and Practice of Expert Surgical Dissection
Jaime Long, MD
Chief, Section of Urogynecology
The Reading Health System

Disclosures
• I have no financial relationships to disclose

Objectives
• At the conclusion of this talk, the participant should be able to:
  – 1. Demonstrate dissection techniques which allow for safe exposure of anatomy
  – 2. Identify and explain the specific purposes of each dissection maneuver
  – 3. Expertly reveal the structural anatomy contained within the dissection field

Introduction
• The core skills of the competent surgeon:
  – Knowledge of relevant anatomy
  – Safe exposure of the anatomy (Ref 1)
• Assuming knowledge of structural anatomy, skills of surgical dissection and tissue handling enable the competent surgeon to reveal anatomy without disrupting its structural or functional integrity
• These techniques are universal skills
  – Abdominal, laparoscopic, robotic, vaginal

Surgical Dissection
• Purpose
  – Expose anatomic structures
  – Safeguard structural and physiologic integrity
• Goals
  – Minimize bleeding
    • Allows for full visualization of tissues and relevant structures
  – Thin out visceral connective tissues to identify structures by sight or palpation, mm by mm
  – Identify avascular planes/spaces

One cannot expect good surgical outcomes without good surgical dissection! (Ref 2)
Learning, mimicking, and applying surgical dissection techniques and good tissue handling will allow the student surgeon to develop into a sound surgeon with minimal complications and blood loss during surgery.
Techniques of Expert Dissection

- “Millimeter by Millimeter”
- “Grasp and Tent”
- “Push and Spread”
- “Traction-Counter-Traction”
- “Gentle Wiping/Teasing” of tissues
- Hydrodissection
- Skeletonizing

“Millimeter by Millimeter”

- Gradual, deliberate, controlled thinning out of connective tissues to reveal structures within
- 4 Goals
  - Maintain correct orientation and direction of dissection
  - Continual evaluation of instruments and techniques employed (flexibility)
  - Explore anatomic structures safely
  - Limit injury of viscus or blood vessels

“Grasp and Tent”

- Operator elevates the tissue (often peritoneum) away from vital structures (ureter, artery, vein, bowel, bladder, nerve) before making incision
- Aids in thinning out of grasped tissue to improve visualization

“Grasp and Tent” Video

“Grasp and Tent”

- Operator elevates the tissue (often peritoneum) away from vital structures (ureter, artery, vein, bowel, bladder, nerve) before making incision
- Aids in thinning out of grasped tissue to improve visualization

“Grasp and Tent” Video
“Push and Spread”

- Aka “poke and open”
- Further thins out connective tissue and releases scarring
- Aided by “traction-counter-traction” and “grasp and tent” techniques

“Push and Spread”


“Push and Spread” Video

“Traction-Counter-Traction”

- A gentle pulling technique that further thins out the visceral connection tissues in order to further reveal the structural anatomy
- Allows for better visualization of the field of dissection
- May be performed by a surgeon with the assistance of another member of the surgical team

“Traction-Counter-Traction”


“Traction-Counter-Traction” Video
“Gentle Wiping/Teasing”

• Proceed gently, mm by mm
• Further thins connective tissue, clears blood from field, reveals tissue planes
• Avoid blunt, quick strokes which may cause unwanted damage to viscus or vessels

Hydrodissection/ CO2 gas dissection

• Injection of sterile fluid into the surgical field to tent and thin out the connective tissue fibers
• Helpful for opening potential spaces (RP, VV, PV, PR, RV) and sidewalls
• Also helpful in vaginal dissection
• Similar technique utilizes CO2 gas in laparoscopy to dissect open spaces

Skeletonizing

• Thinning out of visceral connective tissues enveloping structures, such as blood vessels, via ‘push and spread’ and ‘gentle wipe/tease’ techniques, to render these structures clearly identifiable
• Technique:
  – Typically done with fine cutting instruments such as Metzenbaum scissors
  – Holding the scissor tips open slightly, gently brush the tissue, using care to not cut unintentionally
• Ideal for separating adhesions, broad ligament dissection, and cleaning connective tissue overlying vessels (such as uterine a/v)
Skeletonizing Video

Expert Surgical Dissection Skills

• Empowers surgeon with confidence even in difficult anatomic scenarios
• Faster surgery, less EBL, fewer complications
• Minimize severity of any complication
  – 1-2mm rent in ureter, blood vessel, bladder, bowel is easily repaired

Additional Pearls

• Proceed from easy to difficult dissections
• Maintain flexibility
• Heed warning signs
  – Bleeding, sight/feel of correct plane
• “Do it the same way every time”
• Optimize visualization
  – Lighting
  – Retraction
  – Hemostasis

Less blood loss
+
Less trauma to tissues and surrounding structures

Better surgical outcomes

References/Additional Readings

AAGL - Vancouver
The Education and Process of Becoming a Competent Surgeon

Robert M. Rogers, M.D.
Kalispell, MT
18 November 2014

Disclosure
Speakers Bureau: Cook Medical

Two Concerns in Performing Surgery

• What are the anatomic structures in the field of dissection?
  — Intrapelvic AND Retroperitoneal
  — Important
• How to safely identify and safeguard those anatomic structures in the field of dissection?
  — MOST IMPORTANT

Typical Example

• Pelvic anatomy obscured and distorted by thick adhesions — ‘frozen pelvis’
  — Need expert skills of surgical dissection
  • To get to some recognizable anatomy
  — Restore ‘normal anatomy’
  — ‘mm by mm’ safe progression of dissection

The Competent Surgeon

• Confident working knowledge of surgical anatomy – especially retroperitoneal
• Hands-on skills of expert surgical dissections and tissue handling

My Observation

No surgeon can expect his/her surgical results to be any better than his/her skills of surgical dissection and tissue handling.
My Conclusion concerning Surgeons

Therefore, as a surgeon becomes proficient in the expert skills of surgical dissections, he/she will significantly decrease intraoperative blood loss and any complications, and improve his/her surgical results.

Today's Teaching Goals

• How does a gynecologist become a competent surgeon?
• How to best learn and understand gynecologic surgical anatomy? -- an OVERVIEW

How to become a Competent Surgeon

• How to watch and learn from the competent surgeon at a live surgery or from a surgical video
• My recommendations on how to become a competent surgeon
• How to know you are observing expert dissection techniques – critique

Surgical Anatomy for the Gynecologic Surgeon

• The organization of surgical anatomy – The flow of these anatomic structures
• The surgical regions and spaces in the pelvis
• The anatomic structures that define and are contained within each region and space

Expert Surgical Dissections

• The purpose of surgical dissection is to safely expose vital anatomic structures intraoperatively while safeguarding their structural and physiologic integrity.
  – In a bloodless field of dissection
• Spreading and thinning visceral connective tissues
• Purposeful ‘mm by mm’ progression

Expert Surgical Dissections

• DO NOT think of ‘dissecting out the anatomy’
• DO THINK of dissection as the thinning and spreading of the enveloping connective tissues and any scarring that contain the vital anatomic structures -- ONLY purpose
• The ‘mm by mm’ progression of dissection is the hallmark of the expert dissecor
Becoming a Competent Surgeon

• You must learn from a competent surgeon
  – Live surgery
  – From a surgical video
• Prepare your mind to learn
• Prepare your eyes to observe
• How to prepare and focus for real learning?

Learning from the Competent Surgeon

• Ask yourself two questions:
  • #1 Where in the pelvis is the surgeon operating?
    – Anatomic region or space? Anatomic structures?
  • #2 What specific dissection techniques is the surgeon using – and how?
    – The rationale for each technique –
      thinning/spreading of tissues
    – Observe the progression and flow of dissection

Becoming a Competent Surgeon

• First learn surgical anatomy from a book and from lectures (not from the cadaver)
  – Learn to visualize in 3-dimensions
• Learn dissection techniques from focused observations of the expert dissector
• Practice and learn hands-on dissection techniques from the cadaver
• Appreciate anatomic variations with cadaver

Becoming a Competent Surgeon

• Focused practice with a surgical mentor
  – Animal model (anesthetized pig)
  – Unembalmed female cadaver
  – Progress ‘mm by mm’
  – Meticulous
  – Be honest with yourself

Becoming a Competent Surgeon

• Tissue dissections with a mentor at the operating table on a live patient
  – Practice with each and every surgical case
  – PRACTICE, PRACTICE, PRACTICE
    • Focused – using expert techniques
    • Mimick the skills, hand motions and techniques of your mentor
    • Observe, think, ponder – review your own videos
    • Learn in your mind AND in your hands
      – The feel and flow (the art) of surgical dissection

Becoming a Competent Surgeon

(A proposition to be proved)

By mimicking and applying the expert surgical dissection skills of the competent surgeon, the evolving surgeon can safely perform surgical dissections with minimal blood loss and with no injury to anatomic structures and organs.
Female Pelvic Surgical Anatomy Organization
- Learn the anatomic structures at the Pelvic Brim
- These structures then rotate 90 degrees to become the three surgical layers of the pelvic sidewall
- They naturally lead to the pelvic spaces of the pelvic retroperitoneum

Female Pelvic Surgical Anatomy REGIONS
- (Presacral region/space)
- Pelvic brim
- Pelvic sidewall
- Base of the Broad ligament
  – Parametrium – cervicouterine junction
  – Ureter courses under the uterine vessels

Pelvic Brim
- Ovarian vessels in the infundibulopelvic lig.
- Ureter
- Bifurcation of the common iliac artery
  – Internal iliac artery/external iliac artery
- Common iliac vein – bifurcates
- Obturator nerve
- Sacroiliac joint

Pelvic Sidewall
3 Surgical Layers
- 1st – Ureter
- 2nd – Visceral
  – Internal iliac (hypogastric) artery and visceral branches – uterine, superior vesical
- 3rd – Parietal
  – External iliac artery and vein
  – Obturator nerve and vessels
  – Obturator internus muscle

Base of Broad Ligament
Parametrium
Cervicouterine Junction
- Ureter crosses underneath the uterine vessels
- Uterine arteries and veins trifurcate
  – Descending, transverse, ascending
- Anterior – paravesical space
- Posterior – pararectal space

Female Pelvic Surgical Anatomy SPACES
- Paravesical = paravaginal, lateral compartment of the retropubic space
  – Obturator space
- Retropubic space (of Retzius)
- Vesicovaginal, vesicocervical
- Pararectal
- Rectovaginal
SUMMARY

- The Hallmark of the Competent Surgeon
  - Expert ‘mm by mm’ dissection
- How to Learn to be a Competent Surgeon
  - Questions -- dissection techniques, anatomy
  - Mentoring by the expert dissector
- The Anatomic Knowledge of the Competent Surgeon -- the pelvic brim
  - Regions, structures, landmarks

References/Additional Readings

Anatomy of the anterior pelvic spaces

Giovanni Favero M.D. PhD.
Department of Advanced Gynecologic Surgery and Oncology,
Asklepios Hospital
Hamburg, Germany

Objectives:

# 1 – Identify the anatomic regions and spaces
# 2 – Identify the anatomic structures contained within these anatomic regions and spaces
# 3 - To recognize Important anatomic relations that are critical during laparoscopic procedures.
# 4 - Clinical and operative application of the anatomical knowlegde.

Why learn anatomy again?

Lack of knowlegde in anatomy:
- Most common reason for injury
- Most common reason for bleeding
- Most common reason for slow surgery

Safety of our patients

Particularities regarding laparoscopic anatomy

- Laparoscopic surgeons must adapt to the altered appearance of anatomy due to the effects of pneumoperitoneum, Trendelenburg positionin.
- Three-dimensional field is projected to video monitors as a two-dimensional image
- Limitations of laparoscopy related to the fixed visual axis, loss of depth of field, and magnification.
- Laparoscopes with different angles of view make orientation more challenging.

Pelvis

2 major compartments:
- Anterior
- Posterior

Divided by the transversely oriented Round and Mackenrodt ligaments in the center of which is the uterus.
Anterior space components:

- Paired Spaces:
  - Paravesical space
  - Paravaginal space

- Unpaired spaces:
  - Prevesical (retropubic) space of Retzius
  - Vesicovaginal / Vesicouterine space

Im common – avascular spaces

Retzius space:

**Importance:**
- gives access to other compartments – paravaginal space
- Correction of paravaginal defects and Burch Colposuspension.

Direct Procedures:
- Anterior pelvic exenteration.
Arcus tendineous

The tendinous arch of the levator ani muscle, a specialization of the internal fascia of the obturator muscle, follows a line from the ischial spine to the posterior aspect of the body of the pubic bone.

Paravesical space:

Importance:
- Pelvic lymphadenectomy
- Preparation for radical Hysterectomy and Trachelectomy
- Gives access to the Retzius space
**Paravesical space: Limits**

- Medially – superior vesicle artery and bladder
- Laterally – external iliac vessels and m. Obturator internus
- Posteriorly – cardinal ligament
- Anteriorly – pubic symphysis

**Vesicouterine/vaginal space**

**Importance:**
- Must be dissected and developed in any type of hysterectomy.

- It is a potential avascular space between the anterior surface of the vagina and the posterior aspect of the bladder, bordered laterally by the bladder pillars
- Entry to this space can be accomplished by incising the vesicouterine fold of peritoneum.
Anatomy of the Posterior Pelvic Spaces
Noah A. Goldman, MD
Subspecialty Director, Gynecologic Oncology
The Valley Hospital
Paramus, NJ

Financial Disclosures
I have no financial relationships to disclose

Objectives
Following this lecture the participant will be able to:

1. Identify the anatomic structures in the posterior pelvis
2. Dissect the avascular spaces of the posterior pelvis
3. Safely perform a ureterolysis from the pelvic brim to below the uterine artery

Anatomy of the Posterior Pelvis

- Dissection of the pararectal space
- Dissection of the rectovaginal space and uterosacral ligaments
- Access to the pre-sacral space
- Dissection of the ureter and uterine artery

Anatomy of the Posterior Pelvis

Pararectal space
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](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](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](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.

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](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538).