Didactic: Pelvic Anatomy Directed to the Prevention and Management of Complications

PROGRAM CHAIR
Javier F. Magrina, MD

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Professional Education Information

Target Audience
This educational activity is developed to meet the needs of residents, fellows and new minimally invasive specialists in the field of gynecology.

Accreditation
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Table of Contents

Course Description........................................................................................................................................1

Disclosure......................................................................................................................................................2

Navigating through the Pelvic Wall: Opening Spaces to Control Bleeding (Uterine and Hypogastric Artery Ligation) and Prevent Nerve Injury
J.F. Magrina ...................................................................................................................................................3

Presacral Space: Important Anatomy to Prevent Hemorrhage, Safe Dissection, Management of Presacral Bleeding, from Mild to Severe
P.M. Magtibay ...............................................................................................................................................8

Sigmoidorectal Anatomy: Blood Supply, Layers of the Bowel, and Importance for Closure of injuries; Is Bowel Prep necessary? What to Do Differently with Colon vs. Small Bowel Injury
P. P.G. .........................................................................................................................................................11

How to Find and Preserve Pelvic Autonomic Nerves Resecting Endometriosis; Consequences of Transection of Sympathetic vs. Parasympathetic Innervation
M. Ceccaroni ...............................................................................................................................................14

The Difficult Parametrial Ureter Made Easy; Anatomy of the Parametrial Tunnel, from Easy to Difficult
J.F. Magrina ...............................................................................................................................................19

A Must for All Gynecologists: Bladder Anatomy: Blood Supply, Layers of the Bladder Wall and Importance for Closure; Prevention and Repair of Bladder and Ureteral Injuries; How to Perform Cystoscopy and Ureteral Stents
P. P.G. .........................................................................................................................................................24

Vascular Disasters: The Large Pelvic Vessels: How to Avoid at Entry and during Surgery, What to Do and Not to Do; Handling of Vascular Injuries to Prevent Major Blood Loss and Death
P.M. Magtibay ............................................................................................................................................30

Identification and Preservation of Pelvic Somatic and Sensory Nerves in Course of Pelvic Surgery: How to Prevent Severe Neural Injuries
M. Ceccaroni ...............................................................................................................................................33

Cultural and Linguistics Competency .............................................................................................................38
ANAT-607: Didactic:
Pelvic Anatomy Directed to the Prevention and Management of Complications

Javier F. Magrina, Chair
Faculty: Marcello Ceccaroni, Paul M. Magtibay, Paul P.G.

This course provides a review of the intraperitoneal and retroperitoneal pelvic anatomy applied to minimally invasive gynecologic surgery with emphasis on preventing and correcting injuries. The discussion on retroperitoneal anatomy will focus on opening lateral spaces for the prevention of ureteral injury by demonstrating ureteral dissection (from easy to difficult), prevention and control of severe pelvic hemorrhage (large vessels and presacral area), preservation of pelvic autonomic nerves during resection of endometriosis, and prevention of motor nerve injury. In addition, anatomy applied for the management of urologic and bowel injuries will be demonstrated.

Learning Objectives: At the conclusion of this course, the clinician will be able to: 1) Dissect the lateral pelvic spaces and the ureters; 2) identify the different retroperitoneal vessels and nerves; and 3) apply the principles of prevention and management of urologic (bladder and ureter) and intestinal (small bowel and sigmoidorectal) injuries.

Course Outline

7:00  Welcome, Introductions and Course Overview  
J.F. Magrina

7:05  Navigating through the Pelvic Wall: Opening Spaces to Control Bleeding (Uterine and Hypogastric Artery Ligation) and Prevent Nerve Injury  
J.F. Magrina

7:30  Presacral Space: Important Anatomy to Prevent Hemorrhage, Safe Dissection, Management of Presacral Bleeding, from Mild to Severe  
P.M. Magtibay

7:55  Sigmoidorectal Anatomy: Blood Supply, Layers of the Bowel, and Importance for Closure of injuries; Is Bowel Prep necessary?  
What to Do Differently with Colon vs. Small Bowel Injury  
P. P.G.

8:20  How to Find and Preserve Pelvic Autonomic Nerves Resecting Endometriosis; Consequences of Transection of Sympathetic vs. Parasympathetic Innervation and New Nerve-Sparing Approaches  
M. Ceccaroni

8:45  Questions & Answers  
All Faculty

8:55  Break

9:10  The Difficult Parametrial Ureter Made Easy; Anatomy of the Parametrial Tunnel, from Easy to Difficult  
J.F. Magrina

9:35  A Must for All Gynecologists: Bladder Anatomy: Blood Supply, Layers of the Bladder Wall and Importance for Closure; Prevention and Repair of Bladder and Ureteral Injuries; How to Perform Cystoscopy and Ureteral Stents  
P. P.G.

10:00  Vascular Disasters: The Large Pelvic Vessels: How to Avoid at Entry and during Surgery, What to Do and Not to Do; Handling of Vascular Injuries to Prevent Major Blood Loss and Death  
P.M. Magtibay

10:25  Identification and Preservation of Pelvic Somatic and Sensory Nerves in Course of Pelvic Surgery: How to Prevent Severe Neural Injuries  
M. Ceccaroni

10:50  Questions & Answers  
All Faculty

11:00  Adjourn
PLANNER DISCLOSURE
The following members of AAGL have been involved in the educational planning of this workshop (listed in alphabetical order by last name).
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R. Edward Betcher*
Amber Bradshaw
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Other: Proctor: Intuitive Surgical
Sarah L. Cohen
Consultant: Olympus
Erica Dun*
Joseph (Jay) L. Hudgens
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Frank D. Loffer, Medical Director, AAGL*
Javier F. Magrina*
Suketu Mansuria
Speakers Bureau: Covidien
Linda Michels, Executive Director, AAGL*
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FACULTY DISCLOSURE
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).
Marcello Ceccaroni*
Javier F. Magrina*
Paul M. Magtibay*
Paul P.G.
Other: Honorarium for lecture: Ethicon Women’s Health & Urology
Content Reviewer has no relationships.

Asterisk (*) denotes no financial relationships to disclose.
Navigating through the Pelvic Wall: Opening Spaces to Control Bleeding (Uterine and Hypogastric Artery Ligation) and Prevent Nerve Injury

Disclosures

- I have no financial relationships to disclose

Objectives

Discuss how to navigate and safely identify:
- Lateral spaces
- Vessels
- Nerves

Enemies

- external and common iliac art.
- obturator nerve
- lumbosacral trunk
- ureters

Friends

- Superior vesical artery
- Uterine artery
- Internal iliac artery
Practical branching of internal iliac artery

- Anterior: superior vesical, uterine
- Lateral: int. pudendal, inf. gluteal
- Posterior: superior gluteal

Which internal iliac branch has the most different origins?

obturateur artery

Ashley FL, Anson BJ. Am J Phys Anthropol 28:381, 1941

Which internal iliac branch has the largest diameter?
• Which internal iliac branch has the largest diameter?

**Superior gluteal** (known as posterior branch)

- 5 mm diameter
- 2.7 cm distal to common iliac bifurcation

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**Hypogastric Branches Dissection Abnormal Obturator Artery**
Why do you need to know pelvic nerve anatomy?
Superior Hypogastric Plexus - Left

Pelvic autonomic nerves

References
- Ashley FL, Anson BJ. Am J Phys Anthropol 28:381, 1941

Thank you
Presacral Space: Important Anatomy to Prevent Hemorrhage, Safe Dissection, Management of Presacral Bleeding, from Mild to Severe

Paul M Magtibay, MD
Mayo Clinic Arizona
November 14, 2016

Objectives
• Define the vascular anatomy and anatomic borders of the presacral space
• Discuss reasons for dissection of the space
• Discuss management of presacral bleeding
• Demonstrate the dissection of the presacral space

Boarders & Vasculature
• Sacral Venous Plexus
  • 2Lateral / 1Middle
  • Internal Vertebral
  • Basivertebral
• Presacral Venous Plexus
  • Retraction
  • Valveless system

Presacral Bleeding (1)
• Prevention
  • Know anatomic landmarks
  • Practice developing the space
  • Be smart
    • Sacrocolpopexy
    • Rectal resection: benign versus malignant versus presacral tumors
    • Use available technology: sealing devices
    • Be aware of hemostatic agents available

Presacral Bleeding (2)
• Preparation & Stabilization
  • Pressure
  • IV access
  • Massive Transfusion Protocol
  • Suction x 2 or x 3
  • Hands / Help
Presacral Bleeding (3)

- Control
  - Pressure ***
  - Electrocautery
  - Suture: caution

Presacral Bleeding (4)

- Control
  - Topical hemostatic agents:
    - Floseal (bovine gelatin/human thrombin), Collagen hemostat (instat, avitene), Oxidized cellulose (surgicel, oxycel), Gelatin foam/sponge (gelfoam, surgifoam), Vasopressin (soaked packing), Fibrin glue, Thrombin, Arista
  - Thumb tacks: nope
  - Bone wax: nope

Presacral Bleeding (4)

- 4 x 2 cm segment of rectus abdominis muscle
- Hold over bleeding with forceps
- Cautery at 100 Hz
- Vigorous suctioning
- Fragment may not “stick”

*Harrison; Dis Colon Rectum 2003*

Presacral Bleeding (5)

- Control
  - Tightly pack
  - Leave abdomen open
  - ICU
    - Correct DIC
    - Bring back when more stable
References


Evaluation Question

• What is the best first move when you encounter a significant presacral bleed?
  1. Utilize the muscle fragment welding technique
  2. Place additional large bore IV’s
  3. Apply direct pressure to bleeding site
  4. Apply topical hemostatic agents
  5. Utilize thumb tacks or bone wax
Sigmoidrectal Anatomy

Paul PG MBBS DGO
Paul’s Hospital, Kochi, India

Objectives

- Review the anatomy of sigmoid colon & rectum
- Discuss the closure of large bowel & small bowel injuries
- Describe the differences
- Discuss the role of Bowel preparation

Sigmoid

- S-shaped distal portion of colon about 40 cm long
- Definite mesentery
  - inferior mesenteric vessels(IMA), superior hypogastric plexus, nerves & lymph nodes
- Opening mesosigmoid window
  - fundamental surgical step of colorectal surgery

Rectum

- Extends from S3 to upper limit of anal canal(10-15 cm)
  - Proximal third intraperitoneal
  - Middle third covered by peritoneum continuous with POD
  - Distal third retroperitoneal
- Rectum expands to rectal ampulla under Cul de sac

Blood supply

Sigmoid

- Sigmoid arteries (2-4) - branches of IMA

Rectum

- Superior rectal (branch of IMA)
- Middle rectal (branch of hypogastric artery)
  - anastomose with superior rectal
- Middle rectal - minor blood supply - compromise of IMA blood supply (rectal dissection): leakage at the colorectal anastomosis*

*Patricio J et al 1988

Other: Honorarium for lecture: Ethicon Women's Health & Urology
**Blood supply**

**Small intestine**
- Branches of superior mesenteric artery
- Anastomose to form a series of arcades
- Each branch of arcade supplies a small segment of intestine with little overlap of blood supply

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**Layers of colon**

4 layers – mucosa, submucosa, muscularis and serosa
- Submucosa contains blood vessels & Meissner plexus
- Muscularis - inner circular, outer longitudinal muscles and myenteric (Auerbach) nerve plexus
- Teniae coli are formed by outer longitudinal muscles. 3 Teniae coli coalesce to form complete longitudinal layer over rectum

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**Layers of small bowel**

2 layers of muscle oriented at right angles
- Thin continuous longitudinal layer
- Thicker circular inner layer
This 2 layer muscular arrangement provides safe guard against small perforating injuries (Muscular contraction seals off)

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**Closure of Small bowel injuries**

- Trocar injuries - check for through and through perforation
- Repaired in 2 layers transversely to minimize stenosis
- Laceration > half diameter - resection, anastomosis
- If mesenteric blood supply is interrupted - resection is done regardless the size of laceration

*DeCherny AH 1988*

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**Small bowel Trocar Injury**

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**Closure of small bowel injury**
Is bowel prep necessary?

- Bowel without fecal and gaseous contents are easier to handle.
- In deep endometriosis where bowel surgery is indicated an enema the night before is recommended
- An additional enema 2-3 hours before surgery (colorectal surgeons)

References

Objectives
Review the surgical anatomy of the visceral innervation of the female pelvis
Discuss operative technique to avoid damages to these structures during endometriosis surgery
Laparoscopic dissection of left lateral and medial para-vesical space in DIE

Lympho-Vascular and Parametrial tissues of female pelvis

Anterior Parametrium

Uterus

Bladder

Ureter

Posterior Parametrium

Lateral Parametrium


Postero-lateral parametrium:

"..the so-called rectal pillar (otherwise referred to as dorsal or posterior parametrium) is defined after surgical opening of the rectovaginal septum and pararectal spaces. The rectal pillar corresponds to the uterosacral ligament plus the rectouterine and rectovaginal ligament. It can be separated surgically from the hypogastric nerve that runs lateral to it."


Postero-lateral parametrium and its ligaments


Laparoscopic surgical anatomy of Autonomic visceral pelvic nerves

"Neuro-anatomy of posterior parametrium and surgical considerations for a nerve-sparing approach in radical pelvic surgery."
**Postero-lateral parametrium and its ligaments**


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**Classical Technique for DSE**

Laparoscopic surgical anatomy recto-vaginal space

Www.issaschool.com

**Nerve-Sparing Technique for DSE**

Laparoscopic nerve-sparing radical hysterectomy with rectovaginal and parametrial resection

Www.issaschool.com

Relationships btw fasciae and planes: Heald’’s “Holy Plane”, Recto-Sacral space and Waldeyer’s fascia


Rectum-mesorectum wrapped into fascia recti (M. Ceccaroni, A. Maggioni, Paris 2008)

(Surgical parametrial steps and sites at higher risk of denervation during Radical Pelvic Surgery)

D) Separation of the lateral sheet of the presacral Visceral Pelvic Fascia which contains the nerve structures, from the deep portions of recto-vaginal and vesico-uterine ligaments fibers

B) Identification of nerve roots and fibers

F) Functional cartography of Pelvic Plexus

A) Development of real and virtual avascular spaces and fascial planes


I) Know-how/nerve-sparing “Good Manners”

G) Selective neuro-ablation

E) Identification of nerve-sparing Surgical Landmarks (Middle Rectal Artery, Deep Uterine Vein, Superior Vesical Vein)

H) Tailoring the level of resection/colpectomy

Laparoscopic retroperitoneal dissection of visceral innervation of the pelvis in pre-sacral space

"The Negrar Method": Nerve-Sparing laparoscopic radical excision of deep endometriosis with segmental rectal and parametrial resection

THANK YOU

Aknowledgements:
Dr. R. Clarizia,
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Dr. M. Lamanuzzi,
Dr. C. Kiefert
Prof. L. Bovicelli
Disclosures

I have no financial relationships to disclose

Objectives

• Parametrial ureteral anatomy
• Prevention of injury at endoscopic hysterectomy
• Ureterolysis: mild, severe, impossible

The incidence of ureteral injuries in gynecologic laparoscopic surgery during the past 15 years has:

• A. decreased
• B. remained the same
• C. increased
• D. don’t know

<table>
<thead>
<tr>
<th>Year</th>
<th>% Laparoscopic ureteral injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.03-0.5* (1.7)</td>
</tr>
<tr>
<td>2009</td>
<td>0.03-0.7** (1.6)</td>
</tr>
<tr>
<td>2014</td>
<td>0.02-0.4***</td>
</tr>
</tbody>
</table>

*Clin Obstet Gynecol 45: 469, 2002
**Clin Obstet Gynecol 52:201, 2009
***JMG 21:558, 2014 (only hyst)
Open + vaginal hyst 1984-90 0.3-1.5%
Complex robotic hyst 1.7% Obstet Gynecol 114:585, 2009

URETERAL INJURIES IN GYNECOLOGIC SURGERY 1939-98

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-operative</td>
<td>107,068</td>
<td>0.1</td>
</tr>
<tr>
<td>Intra-operative</td>
<td>3,235</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Intra vs postoperative diagnosis of ureteral injury: is there a difference for the necessity of surgical repair?

intraop dx: 14% 9%
postop dx: 86% 61%

Lit review JMG 2014; 21:558

Parametrial ureter

How close can the ureter be to the cervix?
- A. < 0.5 cm
- B. 1 cm
- C. 1.5 cm
- D. 2.0 cm
How close are the ureters to the cervix?

12% of ureters are within 0.5 cm
= 1 in 8 patients


Identifying ureter at cardinal lig

Ureteral Dissection
Laparoscopic ureteral injuries

intraop dx: 14%  
postop dx: 86%  

N=157 Lit review  
JMIG 2014; 21:558

Your patient has low urinary output and flank pain after hysterectomy

Options to check for ureteral obstruction
- Serum creatinine
- Renal ultrasound
- Retrograde ureteral stent
- Antegrade ureteral stent
Parametrial ureteral dissection

References
Clin Obstet Gynecol 45: 469, 2002
Clin Obstet Gynecol 52:201, 2009
JMiG 21:558, 2014
Obstet Gynecol 114:585, 2009

Thank you
**A Must For All Gynaecologists**  
**Bladder Anatomy**  
Paul PG, MBBS, DGO  
Paul's Hospital, Kochi, India

**Other:** Honorarium for lecture: Ethicon  
Women's Health & Urology

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**Objectives**
- To review Bladder anatomy
- Discuss methods for Prevention of Bladder & ureter injuries
- Video demonstration of repair of bladder & ureteric injuries
- Video demonstration of Cystoscopy & insertion of ureteral stents

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**Bladder – Muscle layers**
- **Dome (β cholinergic)** & **Base (α adrenergic)**
- Detrusor – Mesh work of intertwining muscle bundles
  - Internal longitudinal
  - Median circular
  - External longitudinal
- **Base – Trigone & U shaped band of musculature (Detrusor Loop)**
  - Trigone is made of muscle that arises from ureters & continues as vesical neck & urethra

---

**Blood supply**
- **Superior vesical artery**
  - from non obliterated portion of umbilical artery
  - Supply Dome of bladder
- **Inferior vesical artery**
  - Branch of Internal iliac
  - Supply Base & Trigone

---

**Bladder Injuries**  
**Risk Factors**
- Placement of suprapubic trocars
  - full bladder, Previous caesarean
- During adhesiolysis
- LAVH
  - Inadequate dissection of bladder & Vaginal closure*
- Total Lap hysterectomy
  - Previous caesarean **

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*Source: Neer '1994
**Source: 1994*
Trocar Injury

Prevention

- Empty bladder before suprapubic trocars
- Identify the upper border of bladder
- Bladder to be displaced 2-3cm beyond colpotomy site (LAVH/TLH)

Prevention

- Identifying Bladder Margins
  - Distend bladder with 200 ml with or without dye stained lactated Ringers solution
- Limiting blunt dissection*
- Sheth’s uterocervical broad ligament space for previous caesarean**

*Utrie JW Jr. 1998
**Sheth SS 2006

Recognition

- Gas in the urinary bag
- Retrograde instillation of dye
- Cystoscopy
  - Only 35% are recognized during hysterectomy before cystoscopy*

**Repair**

- Delineation of injury
  - Trigone, ureters
  - Vaginal cuff proximity
- Laparoscopic closure
  - Water tight full thickness closure
  - 2-0/3-0 vicryl continuous or interrupted sutures 1-2 cm apart
- Avoiding mucosa is difficult & unnecessary*
- 2 Layer closure demonstrate decreased rate of vesicovaginal fistula in animal model**

*Wohlrab KJ 2011
**Sokol AI 2004

**Bladder injury**

Pelvic abscess

**Other considerations**

- Injuries close to other suture lines
  - Increased chance of fistula
  - Omental graft / peritoneal imbrication
- Fibrin sealants
  - More inflammation & poor strength*
- EndoGIA stapler, Lapra-Ty, Barbed sutures
  - Not recommended

*Borin JF 2008

**Postoperative management**

- Continuous bladder drainage
  - Foley's catheter - 2 weeks or less*
- Prophylactic antibiotics ?
- Role of cystography before removal

Wohlrab et al. 2011

**Ureteral Injuries**

**Prevention**

**Common sites of injury**

- 80% occur at the ureteral jn with uterine artery*

**Risk factors**

- Previous pelvic surgery
- Adhesions, endometriosis
- Enlarged uterus, cervical/broad ligament fibroids,
- Urinary tract Anomalies

*Gomes CA 2008

**Ureteral Injuries**

**Prevention**

- Identification
  - Visual identification,
  - Ureterolysis in extensive pelvic disease
- Ureteral stents – No significant differences in incidence of surgery*
- Cephalad pressure with Cervical cup of uterine manipulator.
- Careful closure of vaginal cuff – Avoid anchoring stitch lateral to cuff margin

*Chou MT 2008
Ureteric transection

Standard Treatment
Laparotomy - Ureter implantation with or without Boari Flap
- Intraoperative recognition – immediate
- Postoperative recognition
  - Ureteral stents if partial
  - Reapir 6 wks later with percutaneous nephrostomy tube if not fit
- Mode of Repair
  - Upper third – ureteroureterostomy
  - Middle third –ureteroureterostomy with or without Boari Flap
  - Pelvic ureter - Ureteroneocystostomy with psoas hitch

Laparoscopic Anastomosis
- Laparoscopic ureteral repair is comparable to open repair*
- Laparoscopic reanastomosis of 29 women with ureteral transection was succesful in all. Laparoscopic management could become the preferred first line of management**

*Cicco CD etal.2009
**Cholkeri-Singh A etal 2007

Cystoscopy - Instrumentation
- Diagnostic hysteroscopy instrumentation
- Distention medium - Normal Saline
- Full bladder survey - Bladder dome & base
- Ureteric orifices for urine reflux
  - Intravenous indigo carmine / Methylene blue / None

Cystoscopy
Universal cystoscopy

- Detection of urinary tract injury 25.6% to 97.4% after universal cystoscopy
- Negative cystoscopy does not guarantee lack of injury – partial obstruction
- Recommended when bladder or ureters may be injured

*Ibeanu OA et al 2009
**Dandolu V et al 2003
***ACOG Committee Opinion 2007

References


Ureteral stenting

References

Objectives

- Review pros of open technique versus closed laparoscopy
- Demonstrate the technique for open laparoscopy
- Identify important vascular anatomy of the pelvis
- Discuss management of vascular injuries
- Demonstrate some potential vascular catastrophes

I have no financial relationship to disclose.
• 22,500 open versus 761,000 closed cases
  • Enterotomy rate same (0.049% versus 0.067%)
  • Vascular injuries
    • 0% open versus 0.044% closed (p=0.003)
  • No fatal vascular injuries in open laparoscopy
  • Most litigation

Vascular Injury
What to Do

• Direct pressure: sponge with suction
• Increase abdominal pressure: 20-25 mm Hg
  • Alert anesthesia, MTP, vascular surgery & tray
• If controlled, assess trocar placement
  • Clips (caution); suture with Lapra-Ty; bull dogs or Satinsky; hemostatic agents
Vascular Injury
What to Do

- Low threshold to CONVERT to laparotomy
  - Keep pneumoperitoneum while opening
  - Exposure, pack, catch-up and calm down

Vascular Injury
What NOT to Do

- Panic
- Blindly cauterize or suture
- Use crushing clamps
- Slow to convert
- Not rehearse

References

Objectives

- Review the surgical anatomy of the somatic innervation of the female pelvis
- Discuss operative technique to avoid damages to these structures during endometriosis surgery

Neurological complications

- NEUROABLATIVE DAMAGE (due to radicality)
- IATROGENIC DAMAGE (due to a mistake)

Type of damage: Visceral/Somatic/Mixed (due to the type of nerve), Functional/Anatomical

Neuroablative and iatrogenic damages can be associated

Neurological complications can often be overlapped to pre-existing neurological dysfunctions related to disease and/or previous surgery
Endometriosis and somatic nerves

Diagnosis

- Often difficult differential diagnosis
- "Pilgrimage" between orthopaedics, neurosurgeons and gynaecologists
- Often resistant pain, not healed by NSAIDs (FANS) or opioids
- Surgical decompression/neurolysis revealed to be effective in pain relief, comparable to neuromodulation

Surgical Approach

- Trans-perineal approach
- Trans-gluteal approach
- "Open" approach
- Laparoscopic approach
- Laparoscopic Neuro Navigation (LANN)
- Sacral Neuromodulation

Evidences

- Laparoscopic Neurolysis for deep endometriosis infiltrating pelvic wall and somatic nerves: a retrospective study on 216 patients
- Ceccaroni M. et al., WCE, San Paulo, May 2014

Anatomical remarks

- PUDENDAL NERVE
  - ORIGIN: Sacral plexus (S2–S4)
  - TYPE: mixed, sensitive and motor, somatic and visceral
  - COURSE: Great sciatric foramen, small sciatric foramen, Alcock canal, Perineum
  - FUNCTION: sensitive innervation to the perineum, external genitalia, anal region; motor innervation to the urogenital diaphragm, ischiococcygeus
  - LESIONS: Alcock’s canal syndrome, ano-genital pain, reduced sexual arousability/palpation
**Endometriosis and somatic nerves**

**Medial Approach**

**Lateral Approach**

**PARARECTAL AND RETRORECTAL SPACES**

Laparoscopic Surgical Approaches

**Medial Approach**

**Lateral approach**

**PARARECTAL AND RETRORECTAL SPACES**

Laparoscopic Surgical Approaches

**Medial Approach**

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**Medial Approach**

**Lateral approach**

**PARARECTAL AND RETRORECTAL SPACES**

Laparoscopic Surgical Approaches

**Medial Approach**

**Lateral approach**

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**PARARECTAL AND RETRORECTAL SPACES**

Laparoscopic Surgical Approaches
Iatrogenic lesions of visceral and somatic nerves:
Sacral Plexus, Sacral roots, Pelvic Plexus and Pudendal nerve

**LESIONS**
- Impaired flexion-extension of thigh/leg, sciatica, hypoaesthesia,
- Chronic pain refractory to opioids
- Impaired pelvic floor muscular functions/hypo-hypertonus
- Impaired bladder, rectal functions
- Alcock’s canal syndrome, ano-genital pain, reduced sexual arousability

**ORIGIN Lumbo-sacral plexus (L4-S3)**

**TYPE** mixed, sensitive and motor

**COURSE** great sciatic notch, buttock, thigh, leg, tibial/common peroneal

**FUNCTIONS** sensitive innervation of buttock, thigh, leg, foot; motor innervation to the posterior thigh, leg and foot muscles.

**LESIONS** Sciatica, hypoaesthesia, flexion defect of thigh.

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**SCIATIC NERVE**

**ORIGIN Lumbar plexus, L2-L4 roots**

**TYPE** mixed, somatic, sensitive and motor

**COURSE** Psoas lateral margin; inguinal ligament; Scarpa triangle; articular branches

**FUNCTIONS** sensitive innervation anteromedial thigh; medial leg and foot; motor innervation extension muscles of the knee (quadriceps femoralis), flexor muscles of the hip (psoas, sartorius, iliacus)

**LESIONS** Leg extension deficit, knee flexor deficit

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**OBTURATOR NERVE**

**ORIGIN Lumbar plexus, L2-L4 roots**

**TYPE** mixed, somatic, sensitive and motor

**COURSE** Psoas lateral margin; inguinal ligament; Scarpa triangle; articular branches

**FUNCTIONS** sensitive innervation anteromedial thigh; medial leg and foot; motor innervation extension muscles of the knee (quadriceps femoralis), flexor muscles of the hip (psoas, sartorius, iliacus)

**LESIONS** Adductor hypotenusa, extirpated root.

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**FEMORAL NERVE**

**ORIGIN Lumbar plexus, L2-L4 roots**

**TYPE** mixed, somatic, sensitive and motor

**COURSE** Psoas lateral margin; inguinal ligament; Scarpa triangle; articular branches

**FUNCTIONS** sensitive innervation anteromedial thigh; medial leg and foot; motor innervation extension muscles of the knee (quadriceps femoralis), flexor muscles of the hip (psoas, sartorius, iliacus)

**LESIONS** Leg extension deficit, knee flexor deficit.

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**Autonomic visceral pelvic nerves**

**Laparoscopic surgical anatomy of**

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Conclusions

1) Neurological damage during laparoscopic pelvic surgery may lead to unrecoverable motoric/sensorial or functional impairment in women treated also for benign conditions (i.e. DIE).

2) Anatomical knowledge is a key for a better know-how and for a safe endoscopic surgery, minimizing the risks of neurological complications.

3) Nerve-Sparing procedures successfully treat the disease with an adequate radicality, offering good outcomes.

4) Laparoscopic approach is less invasive and the more accurate and effective treatment offering.

5) Repair of some neurological damages is feasible by laparoscopy if promptly recognized.

6) Involvement of somatic nerves in DIE is not an uncommon condition, undiagnosed or misdiagnosed in the majority of cases.

7) Gynecologists are supposed to be the most indicated and expert specialists to diagnose and treat this condition and to offer the adequate care to these "orphan" patients.

8) Considering that this kind of surgery requires uncommon surgical skills and anatomical knowledge, it should be performed only in selected reference centres.
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.

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.