Laparoscopic Pelvic Anatomy and Retroperitoneal Landmarks

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Conflicts of Interest

• I have no conflicts of interest relevant to this talk
• Other relationships
  - Alexion - consulting
  - Merck - consulting/research
  - Novocure - consulting
  - Biodesix - consulting
  - Genentech - consulting/speaker’s bureau
  - Clovis - consulting
  - Janssen - consulting
Objectives

• Structures
  – Spaces and Landmarks
  – Vascular Anatomy
  – THE Ureter
  – Lymphatic Anatomy
  – Neurologic Anatomy
• Correlation of Anatomy with Surgical Procedures

Please

• e-mail me if you have questions!
• e-mail me if you want videos!
• e-mail me if you are interested in visiting us!

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Anatomy as the Basis of Medicine

Andreas Vesalius
1514-1564
De Humani Corpus Fabrica by Andreas Vesalius, Padua, Italy (1543)

Pelvic Sidewall Dissection
Tying off the ??

Superficial

Highly variable branching pattern - often can be transilluminated
Deep Watch for Branches!

Anterior Abdominal Wall
Inferior Epigastric
Ilioinguinal and Iliohypogastric Nerves

Injury unlikely with trocar placement but more likely in 10 mm port that require closure

- Injury in 3.7% of Pfannenstiel incisions
  - associated with length of incision esp. if past lateral rectus sheath
- Distribution near lower port sites but injury with trocar uncommon
- Most often injured in fascial closure (entrapment) or neuroma from injury
- Diagnosis
  - Sharp burning pain emanating from the incision and radiating to suprapubic area, labia or thigh
  - Paresthesia over the appropriate nerve distribution
  - Pain relief after infiltrating with local anesthetic
  - Symptoms often worse with Valsalva and can be relieved with hip flexion
- Requires weekly injection with analgesic/steroids, neurolysis, or resection

Genitofemoral Nerve

• often injured removing sidewall masses of pelvic nodes
• consequences minimal (patch of sensory neuropathy)
The Pelvic Spaces

- Para-rectal Space
  - Ureter medially
  - Iliac vessels laterally
  - Cardinal ligament

- Para-vesical Space
  - superior vesical artery medially
  - iliac vessels laterally
  - Cardinal ligament

- Presacral Space

- Space of Retzius
Ureters through Pelvis

Para-vesical space
Para-rectal space
Pre-sacral space

Paravesical and Pararectal Spaces
Superior Hypogastric Nerve Plexus
Para-vesical Space

Para-vesical Space
Abnormal Obturator Vessels

Abnormal obturator vessels are present in 25% of cases.

Aberrant Obturator Vein
Vascular Complications

Vascular Anatomy

- Common Iliac
- External Iliac
  - Deep circumflex, inferior epigastric
- Internal Iliac
  - Posterior Division
    - ilolumbar, lateral sacral, superior gluteal
  - Anterior Division
    - uterine, inferior gluteal, pudendal, superior vesical, obturator, vaginal, inferior vesical
Umbilicus Relative to Weight

Caution if in Trendelenburg
Beware the Common Iliac Veins!

Major Vascular Injury during Trocar Insertion

FDA - Medical Device Reports, 1993-1996
Vessels of the Pelvis
Unanticipated Finding

Uterine Vessels

Uterine artery often travels inferiorly and branches before entering uterus
The Ureter

• Retroperitoneal and enters the pelvis just medially to the bifurcation of the common iliac artery
  – if you can’t find it -> dissect higher!!!
• Underneath ovarian vessels (but close) at the pelvic brim
• Medial to the internal iliac/superior vesical arteries
• Under uterine artery
• Trigone is right on top of the cervix!!
Common Sites of Ureteral Injury

DANGER ZONES!

- Ureter at Pelvic Brim
- 25%
- 33%
- 42%
Finding the Ureter

Ureter enters bladder at the edge - BE CAREFUL!

Ureters and Bladder

Ureter enters bladder at the edge - BE CAREFUL!
Cross Sectional Anatomy

Uterine Manipulators
The Koh Ring and Ureter Position

Taking the Uterine Arteries
Abnormal Mass

Ectopic Kidney
Ways to Injure the Ureter at the Cuff

Thank you!