Inguinal Hernia
Investigation and Treatment

ESS CME
Banff 2020
Roy Kirkpatrick

Goals and Objectives

Outline history and evolution of hernia care

Discuss appropriate investigation of hernias

Discuss the global burden of disease and innovative approaches to meeting the burden

Evaluate the controversy around the use of mesh in hernia repair

Review Risk Management Strategies for Inguinal Hernia

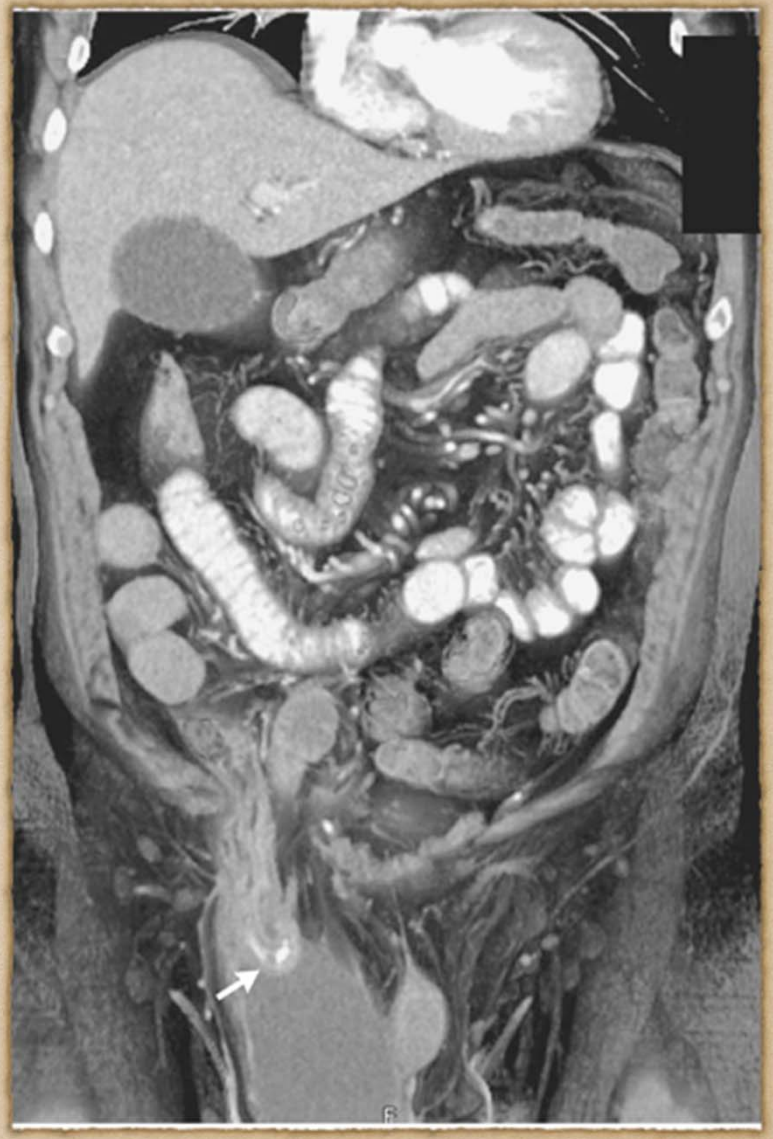
CONFLICTS OF INTEREST

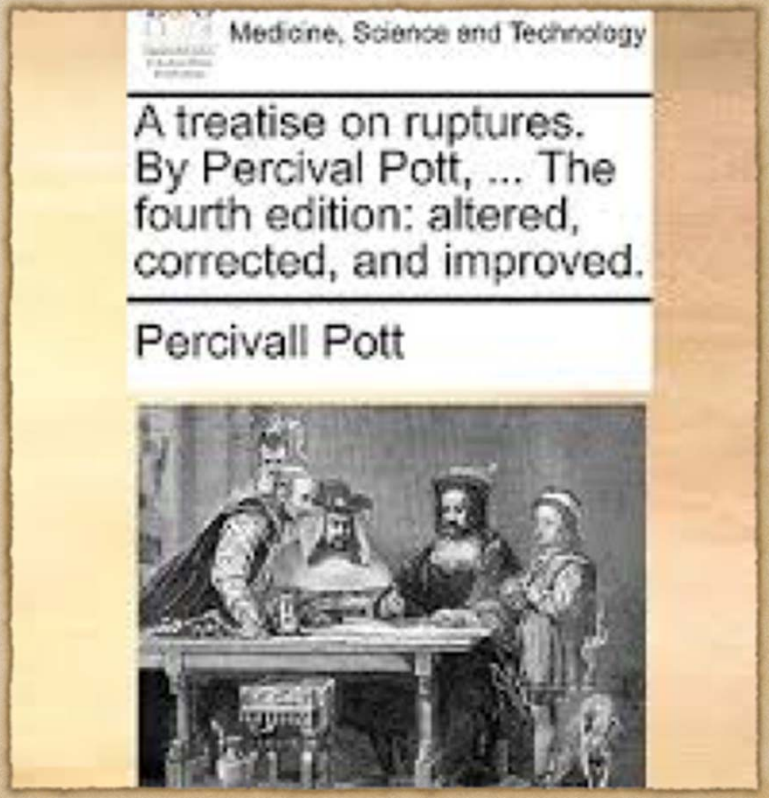
I have no commercial affiliations nor sponsorship

History

Amyand's Hernia

1735
First Documented Successful Appendectomy
150 Years Before McBurney and Groves




Medicine, Science and Technology
A treatise on ruptures. By Percival Pott, ... The fourth edition: altered, corrected, and improved.
Percivall Pott

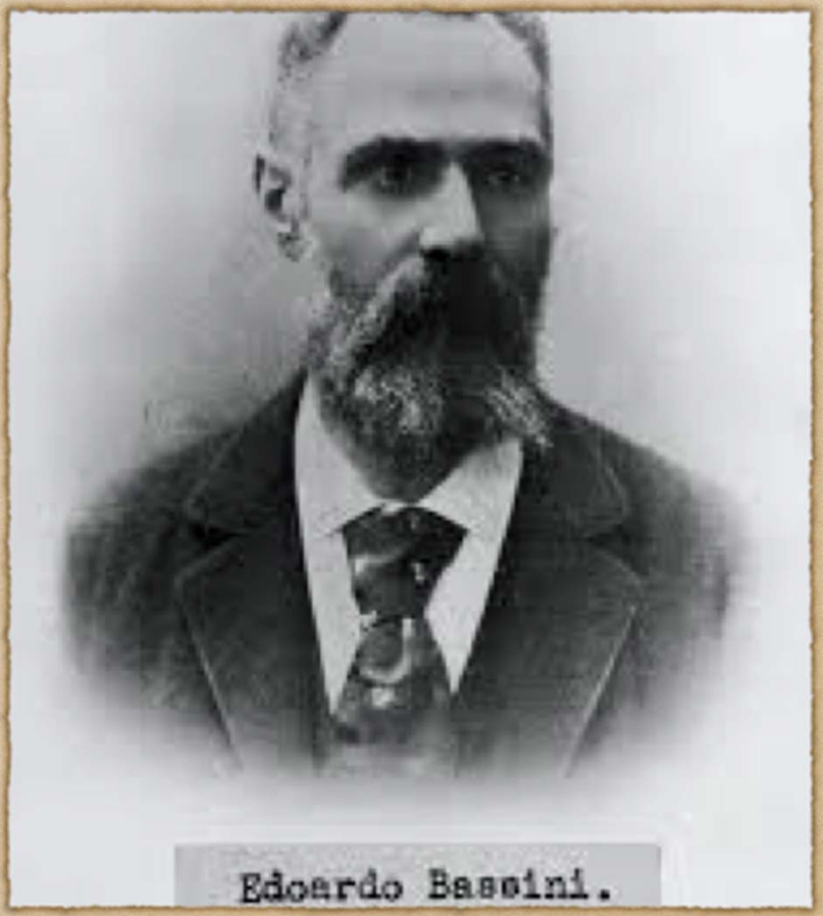
- Pott's Disease
- Pott's Fracture
- Chimney Sweeps' Disease
- Treatise on Ruptures 1756 (Written While Convalescing From a Compound Tibial Fracture) - Debunked Charlatans
- "All that can be done by surgery...is to replace the prolapsed body...in the belly...and to prevent them from flipping out again."
- 4 kinds of hernia: Children, Chronic,Incarcerated, Strangulated

August Richter 1778

- Truss -> tight so as to cause inflammation and contraction of the neck of the sac
- Strangulated Hernia - "an ounce of epsom salts... infusion of camomile flowers... linseed oil... lemon juice... syrup of red poppies... purified opium...spoonful every quarter-hour until it operates"

Edoardo Bassini 1884

- Lowered Recurrence Rate From 100% to 10%
- High Ligation
- Posterior Wall Repair
- Reconstitute Internal Ring Lateral to External Ring to Maintain Obliquity of the Canal



William Gallie 1921

- Barrie, Ontario
- University of Toronto
- American College of Surgeons
- Tension Free Repair With "Living Sutures"

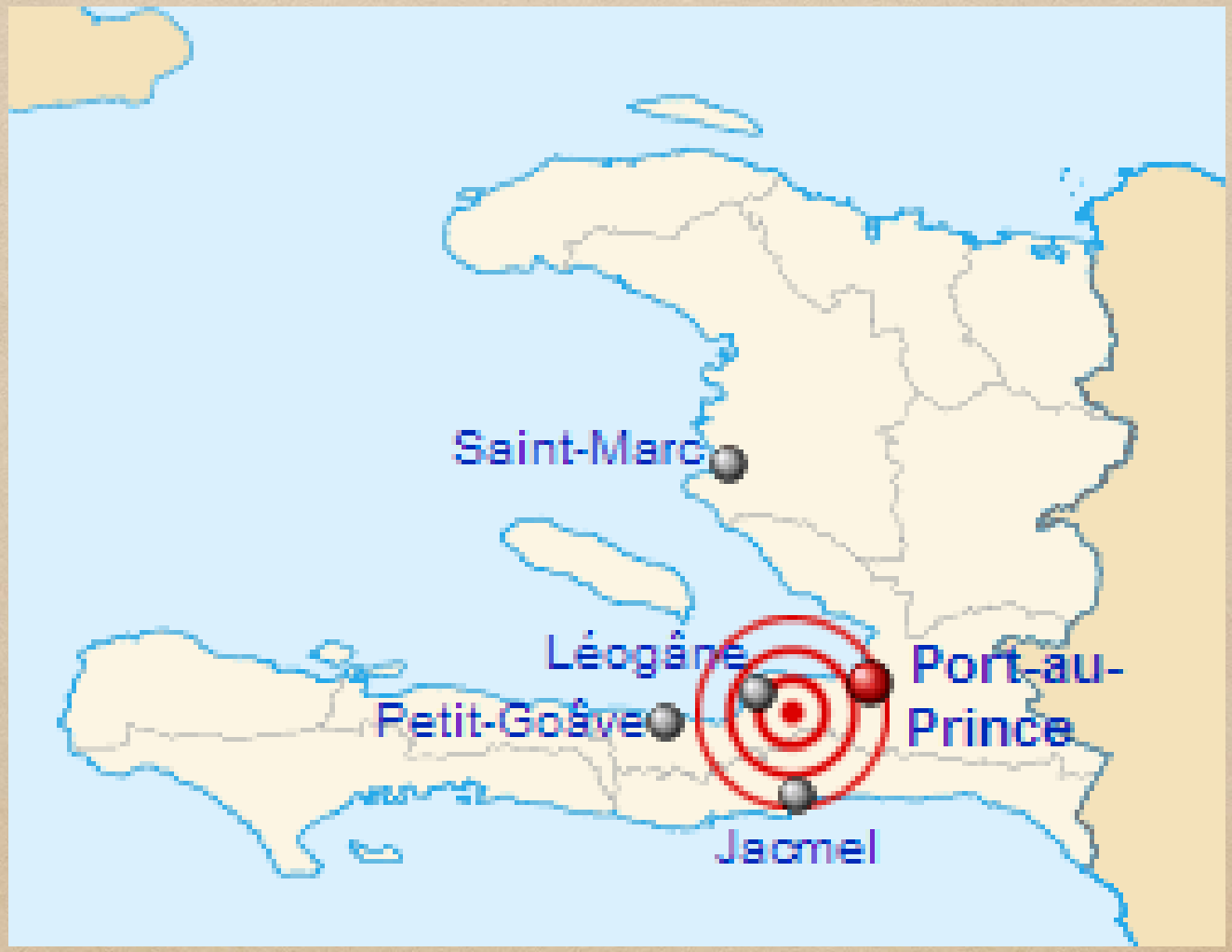
Earle Shouldice

- Early Ambulation
- Local Anaesthesia
- Specialized Hospital
- Multilayer Repair

Chester McVay

Cooper's Ligament Repair

Global Burden of Disease



- 20 Million Repairs Annually
- 27-43% of Adult Males
- 3-6% of Females
- 9.3 Disability Associated Life Years Averted Per Repair - $63 per DALY averted
- Club Foot $350 (Africa)
- Childhood Immunization $438 (Caribbean)
- Oral Rehydration
- At Home Anti-retroviral Therapy for HIV/AIDS

Unique Solutions

- Hernia Camps
- Mosquito Mesh
- CNIS Structured Hernia Course

Cost-Effectiveness Analysis of Inguinal Hernia Repair Performed With Mesh by Medical Officers and Surgeons in Ghana

Volta Regional Hospital

242 Operations

Lichtenstein Repair

$104 (GMO) vs $105 (Surgeon)

$40 - $49/DALY Averted

Risk Factors

- NOT Constipation, Prostatism, Occasional Lifting
- Smoking
- Positive Family History
- Collagen Disease
- AAA
- Previous Appendectomy or Prostatectomy
- Ascites
- COPD
- Long Term Heavy Work

"They Say That Hard Work Never Killed Anyone, But I Thought Why Take The Chance?"

"Smoking Cessation is the Only Sensible Advice With respect to Risk Reduction"

Diagnosis

Groin Swelling and Pain

- SWELLING Femoral Hernia
- Lymph Node
- Aneurysm
- Saphenous Varix
- Abscess
- Soft Tissue Tumour (Endometrioma)
- Scrotal Pathology
- PAIN Osteitis Pubis
- Low Back Pain - Radiation
- Adductor Tendonitis
- Hip Pain
- Ileopectineal Bursitis
- Endometriosis
- PSEUDO-RECURRENCE
- Seroma
- Lipoma of the Cord
- Plug

Physical Examination

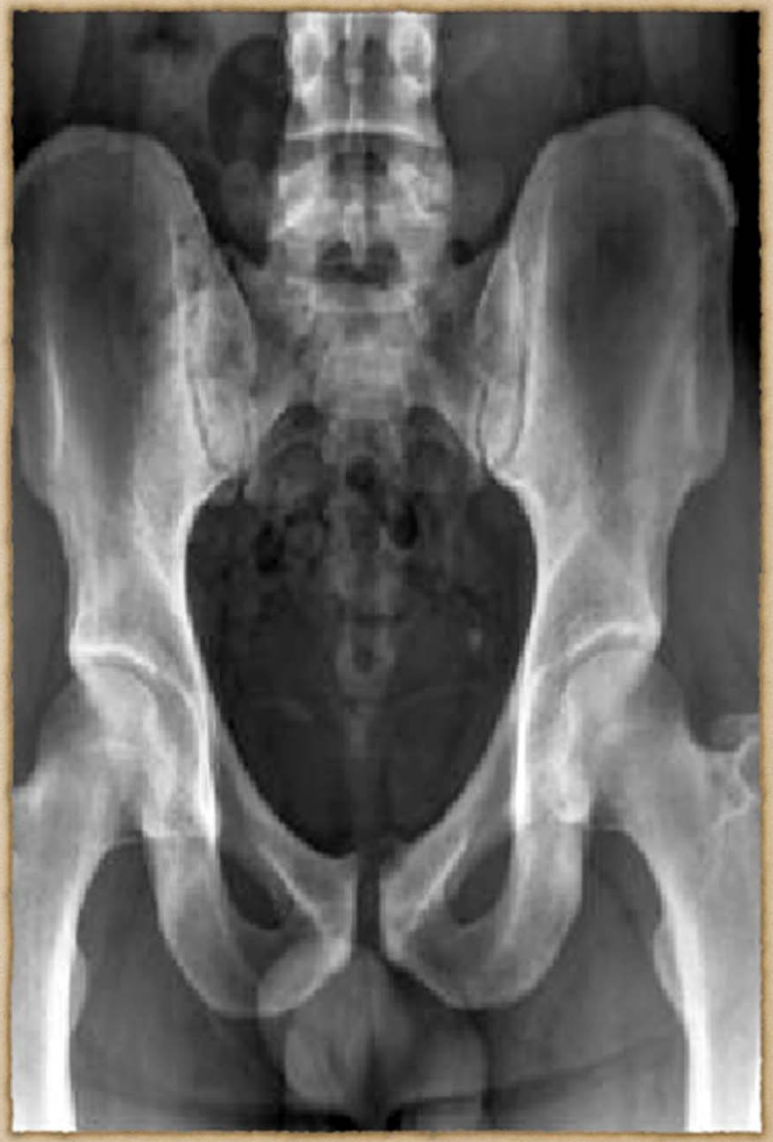
- 92-93% Sensitivity and Specificity
- Usually Sufficient
- No Value Distinguishing Direct vs Indirect
- Femoral Hernia
- "If You Can't, or Don't Want, to do a Physical Examination - Ask Someone Who Can"

"Sometimes the Best Test is a Consultation"

Malcolm Wilson

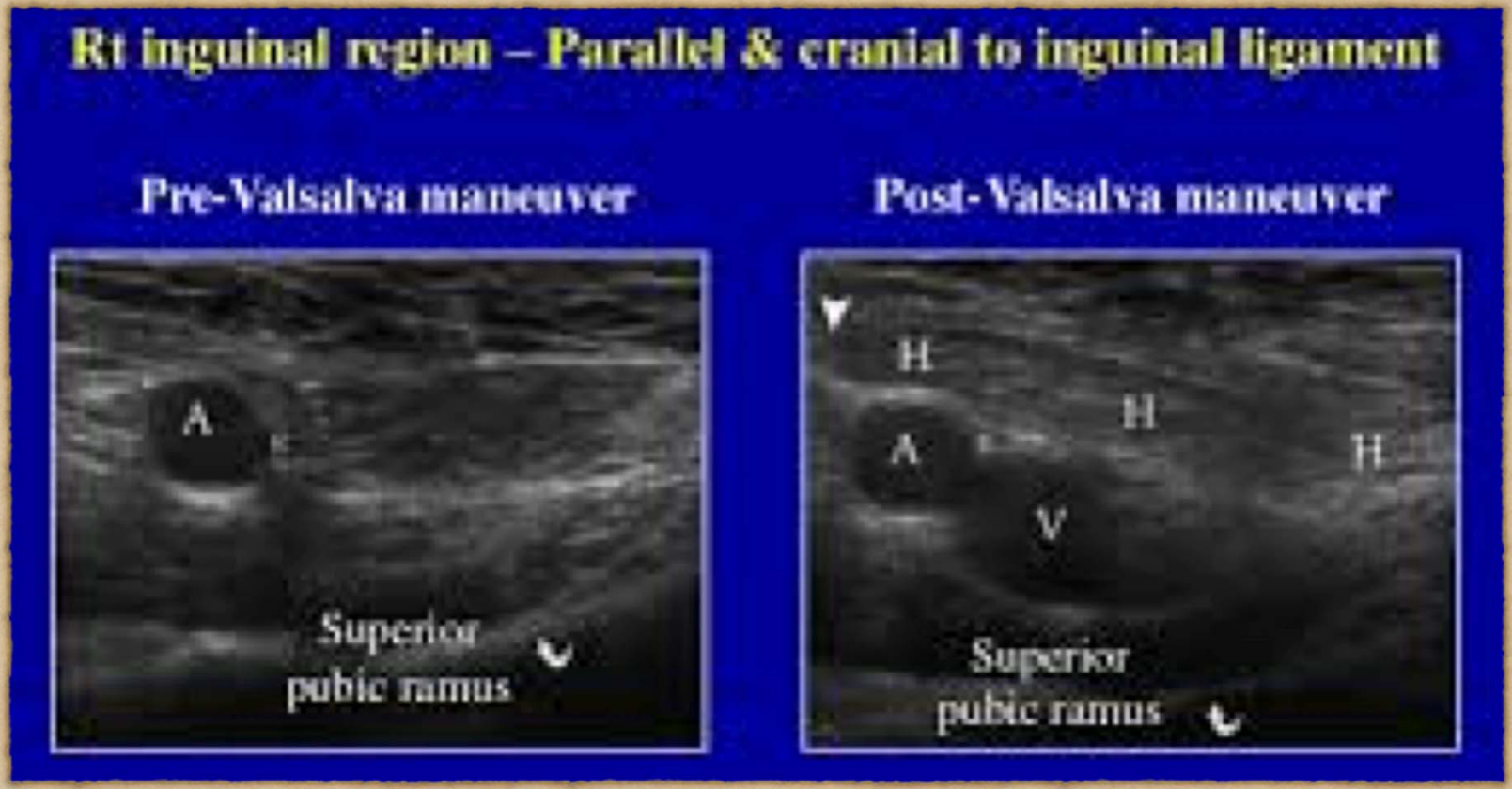
Plain Films

Hip Disease
Osteitis Pubis



European Hernia Society Algorithm for Obscure Pain or Swelling

- Ultrasound (If Expertise Available)
- If Ultrasound Negative -> MRI With Valsalva
- If MRI Negative -> Consider Herniography

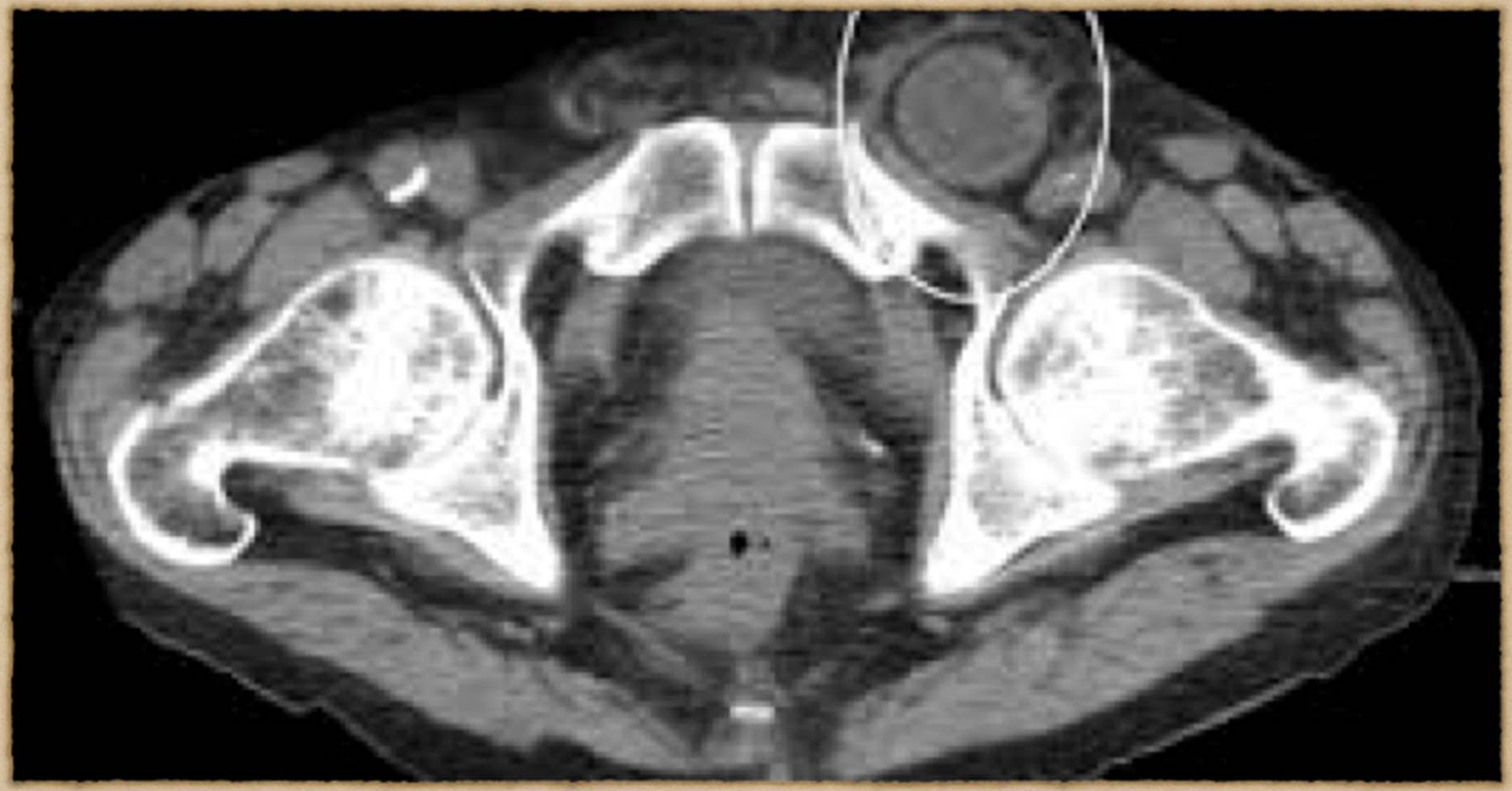


Ultrasound

100% Sensitive in Patients Known to Have Hernias

"Don't Order a Routine Ultrasound for Umbilical and/or Inguinal Hernia"

- "Ultrasonography is a useful non-invasive adjunct to physical examination. In clinical occult groin hernia, ultrasound specificity in relation to surgical exploration is 81-100%, it's sensitivity is 33% and up to 100% in clinical diagnosis of a groin hernia."
- "In everyday practice, the sensitivity and specificity of ultrasonography for diagnosing inguinal hernia is low."
- European Hernia Society 2009



CT

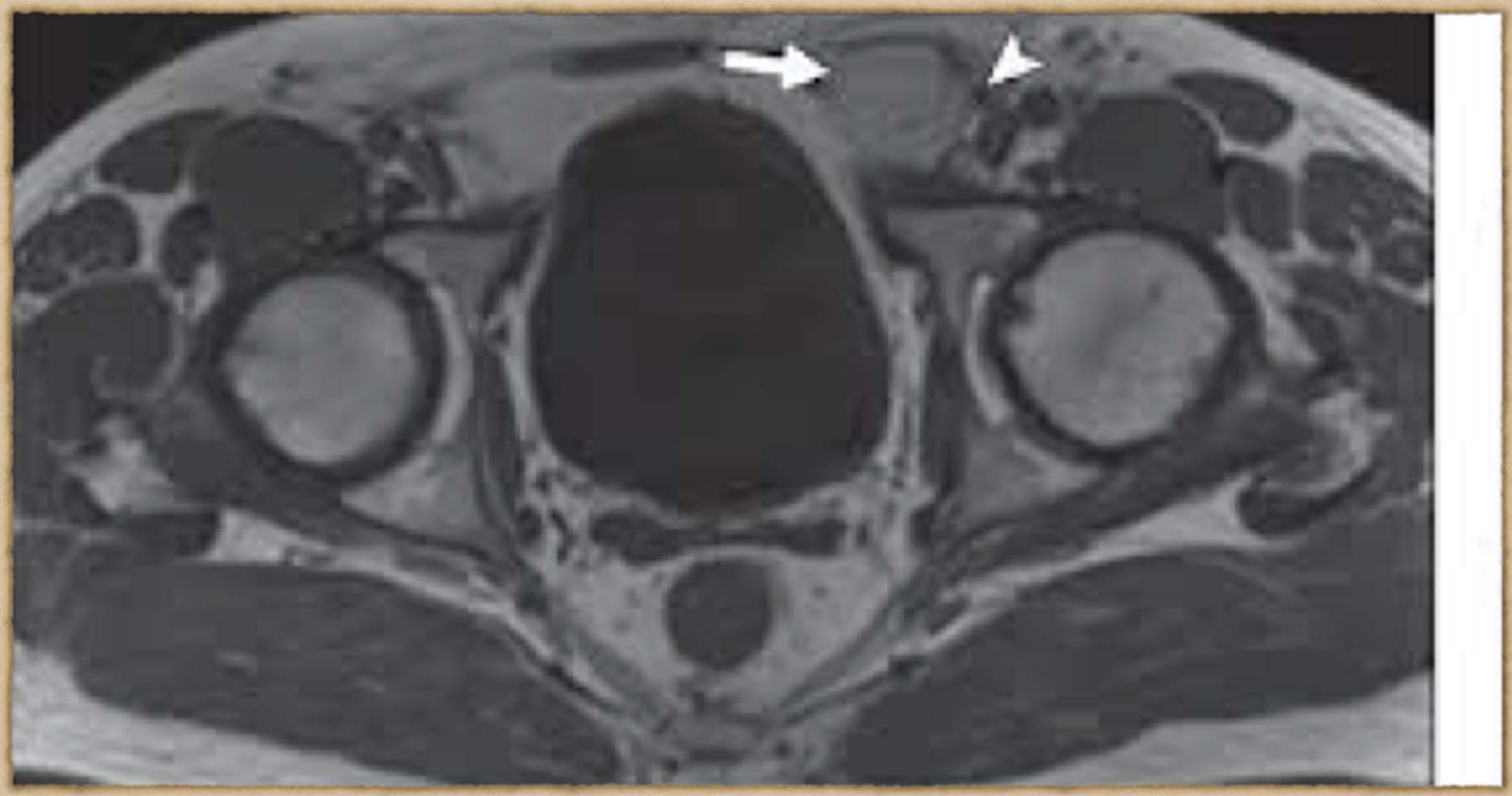
Specificity 83%, Sensitivity 67-83%

"CT does not have a significant role in the diagnosis of inguinal hernia"

Radiologic Reporting and Interpretation of Occult Inguinal Hernia (JACS November 2019)

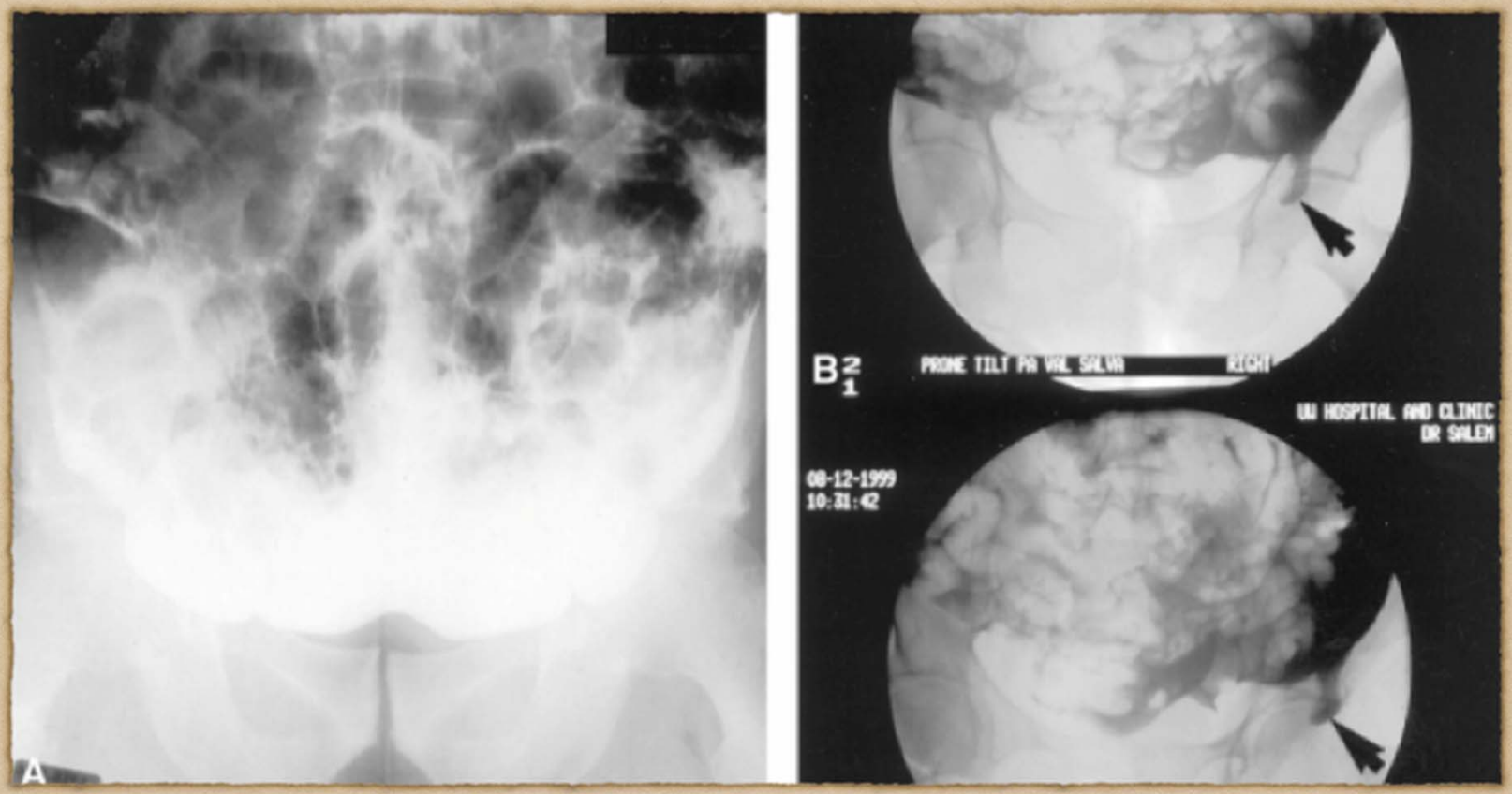
"Dynamic Scanning" (CT or MRI) With Valsalva Radiologist "Over-reading" Improves Accuracy From 35% to 79%

Look at it Yourself

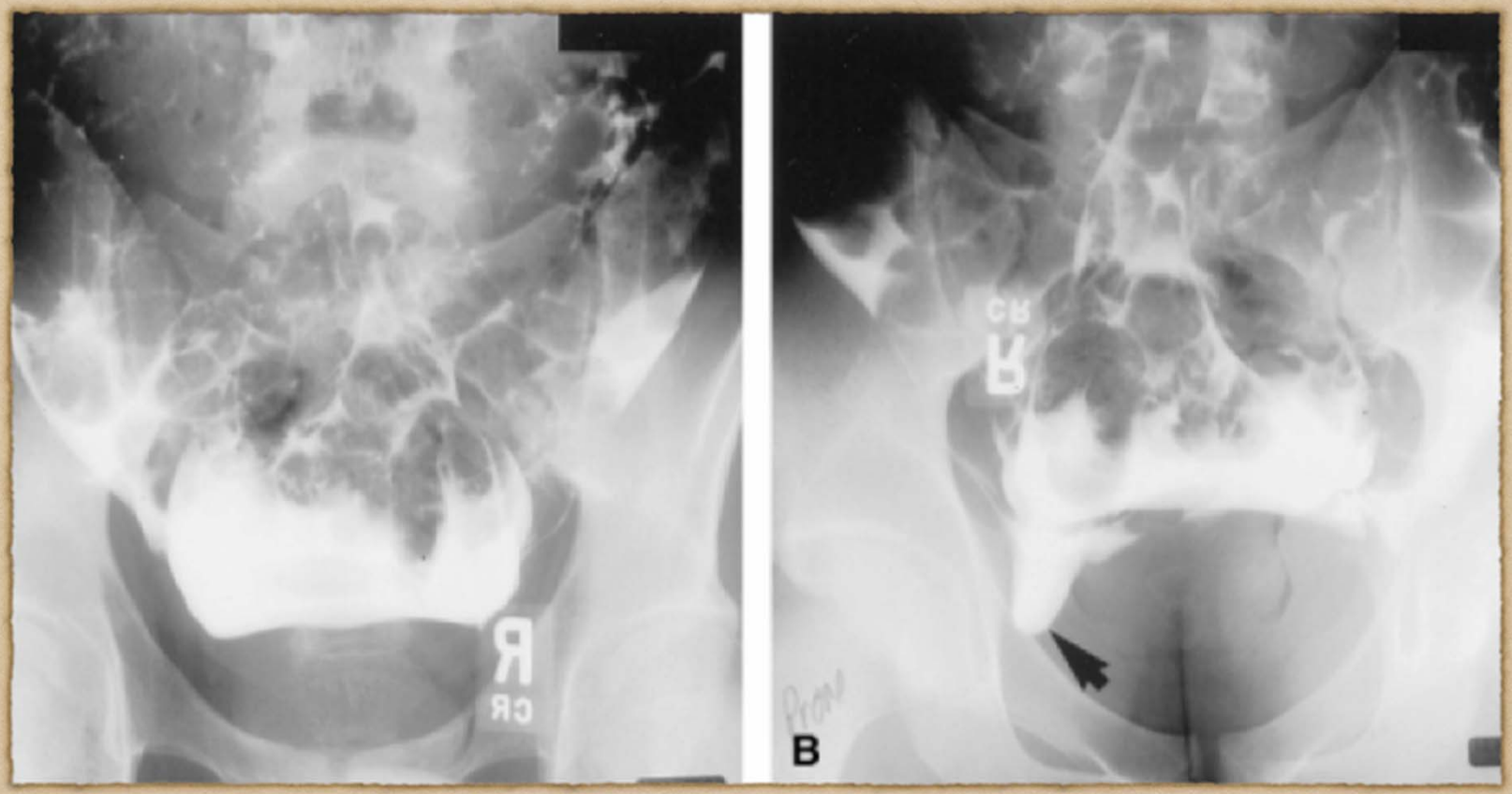


MRI

Sensitivity and Specificity 94%
Other Pathologies
Sports Related Injuries



Herniography



Herniography

- Originally described at HSC for occult hernias and contralateral hernias
- Sensitivity 100%, Specificity 98-100% for Occult Hernias
- Identifies a hernia in 12-54% of cases where no other modality has been successful
- Identifies hernia in 25% of athletes with long standing groin pain
- Complications in 0-4.3% (Contrast Allergy, Intestinal Injury, Abdominal Wall Hematoma)

Laparoscopic Assessment of Contralateral Side

Treatment

Strangulated

- REDUCE IT
- Analgesia
- Trendelenberg Position
- Ice
- Direct the Hernia Content Back Into the Inguinal Canal(don't splay it over the external ring
- ? Role of Laparoscopy

Incarcerated or Symptomatic

- FIX IT
- Elderly (>65!) and/or Infirm -> Marked Increase in Morbidity and Mortality (up to 21%) If Operated as an Emergency

Assymptomatic

- Elective Surgery < .5% Operative Mortality
- Emergency Surgery > 5% Operative Mortality
- "Most Strangulations Occur in People Who Didn't Know They Had a Hernia"
- Rural/Remote Military Exotic Tourism
- Two Major Trials of Watchful Waiting -> Crossover in 25%, Small Numbers of Adverse Events

"Avoid Repair of Minimally Symptomatic Inguinal Hernias, Where Appropriate, By Offering an Option of Watchful Waiting for Up to Two Years"

Choice of Operations

- Open Non-Mesh
- Open Mesh
- Laparoscopic
- Robotic

Open Non-Mesh

- Bassini
- McVay
- Shouldice

150 Repairs per Week
Lowest Rates of Recurrence and Post-op Pain When Performed at Shouldice Hospital
Takes Longer
Increased Length of Stay
"Cherry Picking"

Shouldice Continued

- Cochrane Review Showed Overall Higher Recurrence Rate for Shouldice Compared With Open Mesh Repair
- No Difference Re: Chronic Pain, Complications, Post-op Stay
- Best Non-Mesh Repair for Patients Who Refuse Mesh or in Low Resource Settings (HerniaSurge International Guidelines)

Open Mesh Repairs

- Lichtenstein
- Plug Alone or Plug and Patch
- Trans Inguinal Pre-Peritoneal (TIPP) No Better Than Lichtenstein
- Decreased Recurrence and Chronic Pain Compared to Non-Mesh (Including Shouldice)
- Earlier Return to Work
- Decreased OR Time and Hospital Stay
- Chronic Pain Commoner in Cases Done By Residents

Plug or No Plug?

- More Foreign Material
- Pseudo-recurrence and Migration
- Plug Only Technique : Faster, Cheaper,
- Lower Overall Complication Rate (?)

Laparoscopic

- Decreased Wound Infection, Hematoma, Length of Stay
- Increased Serious Complications (Major Vascular and Visceral Injuries)
- Longer OR Time
- Increased Hospital Cost ? Decreased Societal Cost
- Decreased Recurrence Rate Compared With Open Non-Mesh, No Better (Perhaps Slightly Worse) Than Open Mesh Repairs
- Decreased Pain Initially, Evens Out Over Time
- Increasingly Utilized in Paediatric Surgery

Robotic Hernia Repair

Average Cost $5517 VS $3269 For Laparoscopic

COI Not Declared in Most Studies Showing Benefit

Increased OR Time. No Benefit For Patients

Ergonomic Benefit for Surgeons

Complications

- Recurrence
- Wound Infection
- Chronic Pain (Neurogenic, Mesh Related) - Higher Rate When Residents Operate
- Bowel Obstruction
- Fistula
- Urinary Retention
- Visceral Injury
- Mesh Complications
- Vascular Injury

Vascular Injuries

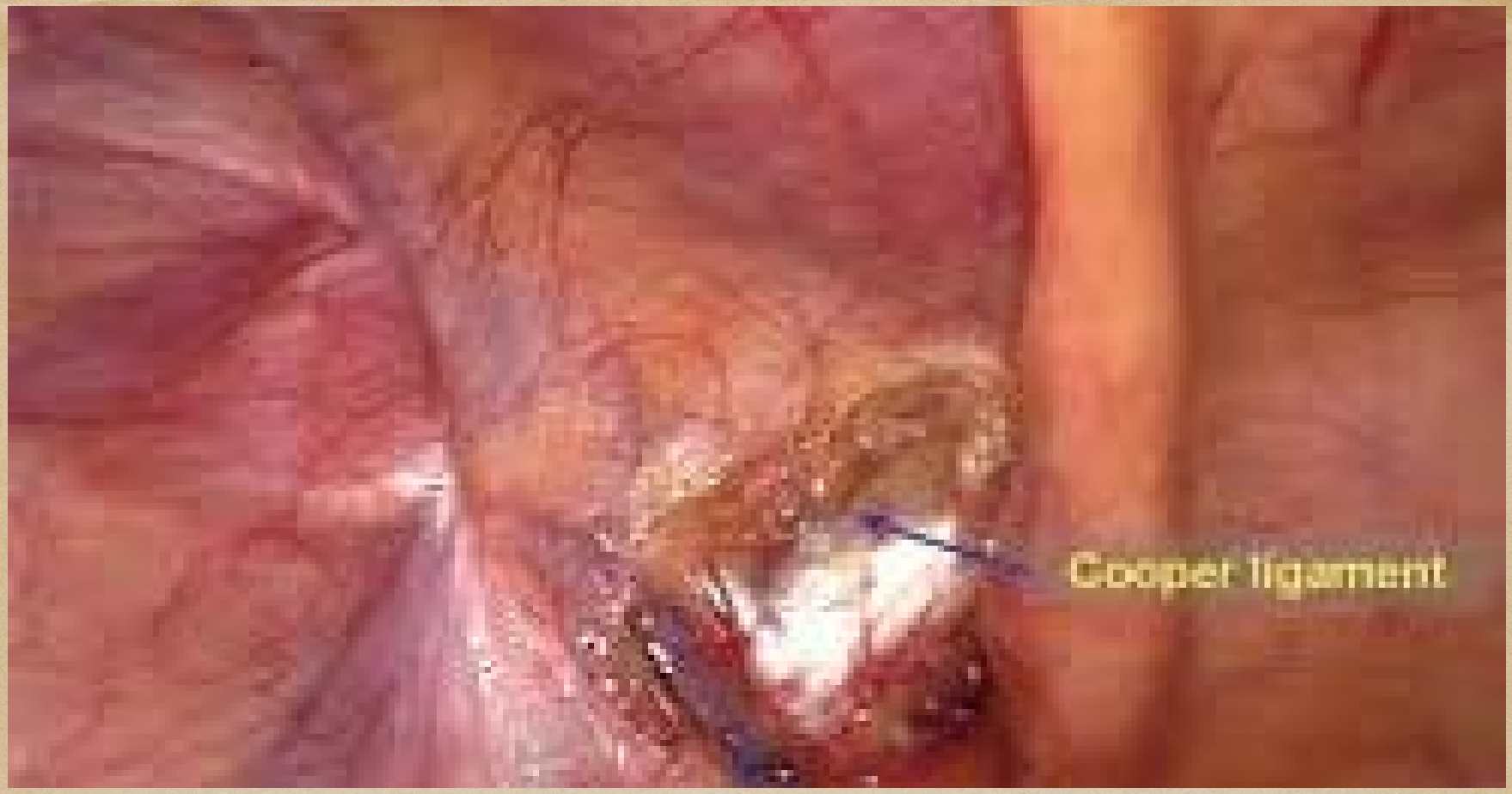
Deep Inferior Epigastric - Ligate

External Iliac - Near Internal Ring

Femoral Vein and Artery (McVay)

Spermatic Cord Vessels - Ischemic Orchitis

"Corona Mortis"



Pressure While Preparing
Avoid Blind Suturing
Proximal and Distal Control
Assess Distal Pulses Post-op

Risk Factors for Recurrence

- Laparoscopic and Non-Mesh Greater Than Open Mesh
- Mesh Weight - No Effect
- Fixation - Short term Absorbable Greater Than Glue, Self-Gripping, Long term Absorbable and Non-Absorbable
- Indirect Sac Excision vs Invagination
- Direct Hernia (Likely Due to Insufficient Medial Mesh Fixation)
- Sliding Inguinal Hernia
- Lipomas of the Cord (Should be Reduced and Excised)
- Hernias Repaired Under Local More Likely to Recur
- Complications (Hematoma, Infection) -> Recurrence
- M & M -> 50% Reduction in Re-operation for Recurrence
- < 50 Procedures per Year in an Institution (Significant)
- < 25 Procedures per Year For Individual Surgeon (Association)
- < 5 Procedures per Year For Individual Surgeon (Significant),

Mesh Complications

- Numerous Recalls
- Intra-abdominal Positioning
- Degradation
- Migration
- "Meshoma"
- Folds
- Dysejaculation

Treatment

- Medical Therapy
- Nerve Blocks
- Re-exploration Neurectomy, Mesh Explantation
- Alternative Modalities
- Litigation

Managing Risks of Hernia Repair CMPA 2007-2011

CMPA

- 121 Closed Cases (80 Legal, 41 College) - Mostly Favourable Outcomes
- Complications: Testicular Atrophy, Nerve Injury, Infection, Chronic Pain
- Allegations: Lack of Informed Consent, Surgical Injury, Inadequate Assessment of Post-op Complications

Risk Management Pre-op

- Document Consent Discussion of Surgical Risks (ie Scarring, Chronic Pain, Recurrence)
- Does Patient Understand the Explanation?
- Unauthorized Procedures
- Delay in Diagnosis (Undifferentiated Abdominal Pain)

Risk Management Intra-op

- Wrong Side Surgery "Operate Through Your Initials"
- Surgical Check List
- Injuries to Bowel, Bladder, Blood Vessels, and Nerves
- Technique, Inexperience, Misidentification of Anatomy

Risk Management Post-op

- Delay in Diagnosis of Complications
- Unclear Discharge Instructions