

Revolutionizing Outpatient Interventional Radiology: Cutting-Edge Techniques and Innovation

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IYA MEDICAL / Interventional Radiology and Imaging



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Disclosure(s): None



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Why Outpatient IR

- "Cost Cutting" - a term that resonates with us all.

Interventional Radiology Clinic:

- Designed for **easy and convenient access**.
- Prioritizes **patient comfort** throughout the process.
- Significantly reduces the **risk of infection**.
- Promotes **faster recovery times**.

Cost-Effective Solution:

- Offers an **overall more cost-effective alternative** to traditional in-hospital procedures.
- Yields a substantial **46% direct cost savings** for the patient.

Immediate Financial Benefits:

- **Direct and immediate savings** for our patients.



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Pelvic Congestion Syndrome - Incidence

- *Statistical Insight:* 10% of female renal transplant donor candidates undergoing renal venography revealed **reversed ovarian vein flow**.

Pelvic Congestion - A Common Correlation:

- *Key Observation:* Up to 60% of women with reversed ovarian vein flow may experience **symptoms of pelvic congestion**.

Linking Chronic Pelvic Pain and Pelvic Congestion:

- *Evidentiary Findings:* A significant **31% of women with chronic pelvic pain** were found to have concrete evidence of **Pelvic Congestion**.

These statistics underscore the importance of interventional radiology in identifying and addressing conditions like pelvic congestion, contributing to the overall well-being of patients.

- **2nd leading cause of chronic pelvic pain in females**



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Age Range: Typically observed in women aged 20 to 45 years.
Commonality: More prevalent in multiparous women.

Clinical Presentation:

Pain Profile: Patients often report dull, aching pain.

Pain Characteristics: Pain is usually noncyclical and exacerbated by standing or valsalva maneuvers.

Associated Symptoms: Additional symptoms may include dyspareunia/post-coital pain, lethargy, and depression.

Physical Examination Findings:

Clinical Evaluation: Healthcare providers may identify **ovarian or cervical motion tenderness**.

Neurological Manifestation: Some patients may exhibit **lumbosacral neuropathy**.

Vascular Implications: The syndrome can lead to the development of **vulvar, rectal, and lower extremity varices**.

Understanding the clinical patterns of pelvic congestion syndrome is crucial for accurate diagnosis and the subsequent delivery of interventional radiology services tailored to the patient's needs.



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Defining Chronic Pelvic Pain (CPP):

Definition: Constant or recurring non-malignant pelvic pain lasting over six months.

Epidemiology:

Prevalence: Occurs in up to **39% of women** during their lifetime.

Current Prevalence: Estimated at **15%**.

Clinical Impact:

Healthcare Utilization: Accounts for **10% of Gynecological visits**, **40% of diagnostic laparoscopies**, and **10-15% of hysterectomies**.

Challenges: Often frustrating for both patients and physicians.

Diagnostic Dilemma:

Undiagnosed Majority: Approximately **60% of patients** never receive a definitive diagnosis.



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Role of Pelvic Venous Insufficiency:

Significant Contribution: Pelvic Venous Insufficiency is estimated to be a causative factor in **13-31% of Chronic Pelvic Pain cases**.

Understanding the prevalence and diagnostic complexities of chronic pelvic pain, as well as the role of conditions like Pelvic Venous

Insufficiency, is vital for optimizing patient care and management.



Endometriosis: A common condition where endometrial tissue grows outside the uterus.
Adhesions: Abnormal tissue connections, often due to prior surgeries or infections.
Leiomyoma (Uterine Fibroids): Benign growths in the uterus.
Pelvic Venous Insufficiency: Valvular dysfunction in pelvic veins leading to congestion.
Adenomyosis: Uterine tissue growing into the muscular wall.
Uterine Prolapse: Descending of the uterus into the vaginal canal.

Gastrointestinal DDX:

Constipation: Difficulty passing stool regularly.
Irritable Bowel Syndrome (IBS): A functional GI disorder causing abdominal pain and bowel changes.
Diverticulitis: Inflammation or infection of diverticula (pouches in the colon wall).
Diverticulosis: Presence of diverticula in the colon.
Chronic Appendicitis: Ongoing inflammation of the appendix.
Meckel's Diverticulum: A congenital pouch in the small intestine.
Porphyria: A group of rare genetic disorders affecting the nervous system or skin.

Genitourinary (GU) DDX:

Interstitial Cystitis: A chronic condition causing bladder pain.
Bladder Dyssynergia: Dysfunctional coordination of the bladder muscles.
Chronic Urethritis: Inflammation of the urethra lasting over time.
Chronic Pyelonephritis: Ongoing kidney infection.
Urinary Tract Infections: Bacterial infections affecting the urinary tract.
Musculoskeletal DDX:
Fasciitis: Inflammation of the fascia, often plantar fasciitis or others.
Nerve Entrapment Syndrome: Compression of nerves in various anatomical sites.
Hernias: Protrusion of an organ or tissue through a weakened wall.
Fibromyalgia: A chronic pain disorder.
Scoliosis: Abnormal lateral curvature of the spine.
Degenerative Disc Disease: Age-related changes in spinal discs.
Osteitis Pubis: Inflammation of the pubic symphysis.



Differential Diagnoses (DDx) for Pelvic Pain

Gynecological (GYN):

- Endometriosis
- Adhesions
- Leiomyoma (Uterine Fibroids)
- Pelvic Venous Insufficiency
- Adenomyosis
- Uterine Prolapse

Gastrointestinal (GI):

- Constipation
- Irritable Bowel Syndrome (IBS)
- Diverticulitis
- Diverticulosis
- Chronic Appendicitis
- Meckel's Diverticulum
- Porphyria



Genitourinary (GU):

Interstitial Cystitis
Bladder Dysynergia
Chronic Urethritis
Chronic Pyelonephritis
Urinary Tract Infections

Musculoskeletal:

Fasciitis
Nerve Entrapment Syndrome
Hernias
Fibromyalgia
Scoliosis
Degenerative Disc Disease
Osteitis Pubis



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Factors Contributing to Pelvic Venous Insufficiency

Understanding Pathological Influences:

Mechanical and Hormonal Factors: Both mechanical and hormonal influences are believed to contribute to the underlying pathology of pelvic venous insufficiency.

Key Mechanisms:

Valve Issues: Absent or incompetent valves in ovarian/internal iliac veins.

Post-Pregnancy Changes: Increased venous capacity observed post-pregnancy.

Hormonal Effects: Venodilation resulting from estrogen.

Venous Compression Syndromes: Including Retr-oaortic renal vein, Aorto-SMA compression (Nutcracker), or common iliac vein compression (May-Thurner).

Understanding these factors provides valuable insights into the development and management of pelvic venous insufficiency.





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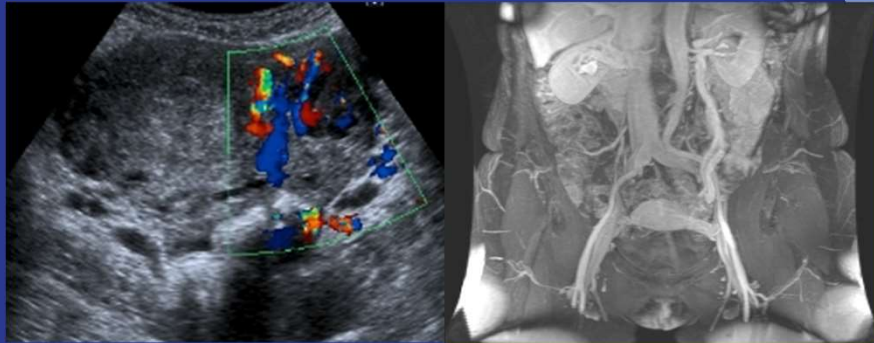
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Diagnosis

1. Detailed history and physical examination
2. Pelvic Ultrasound
3. Cross Sectional Imaging – CT or MRI
4. Catheter Venography
5. Laparoscopy can have low sensitivity for varices
6. Supine position and pressure in peritoneum decompress varices

A black and white catheter venography image of the pelvic region. It shows a network of blood vessels, with a prominent, dark, irregular mass on the right side indicating varices. The label 'LT' is visible in the bottom right corner of the image.A white logo consisting of stylized, overlapping letters that appear to be 'KYA'.

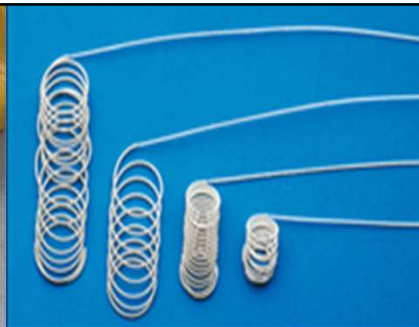
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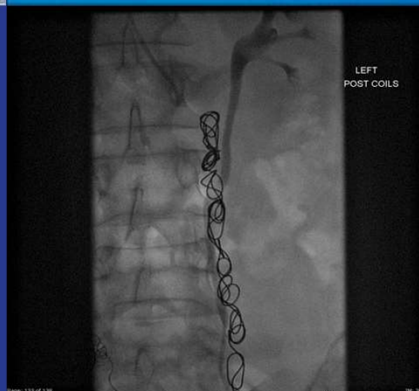
- Tortuous pelvic veins > 6 mm**
- Slow or reversed blood flow
 - Dilated veins in myometrium
 - Polycystic ovaries (~50%), no endocrine abnormalities
 - Improved sensitivity in upright position or with valsalva



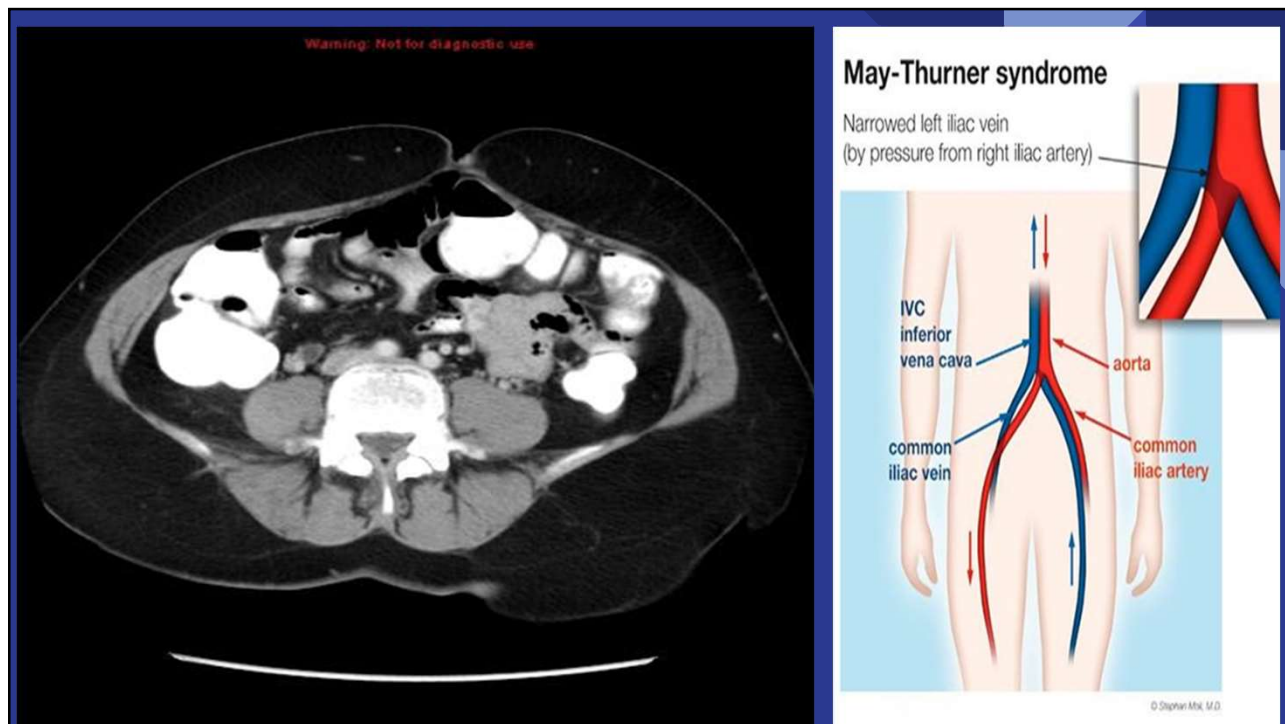
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- First described in 1993 by Edwards
- Goal is occlusion of pelvic varices, refluxing ovarian and internal iliac veins
- Chemical sclerosing agents used to obliterate pelvic varices
- Mechanical devices (coils/plugs) to occlude ovarian veins
- Multiple levels of venous occlusion



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Nutcracker Syndrome:

- Definition:** Extrinsic compression of the left renal vein by the superior mesenteric artery and aorta.

Clinical Presentation:

- Symptoms:** Typically presents with hematuria, flank pain, and pelvic congestion.
- Incidence:** Occurs in up to 18% of Pelvic Congestion Syndrome (PCS) cases.

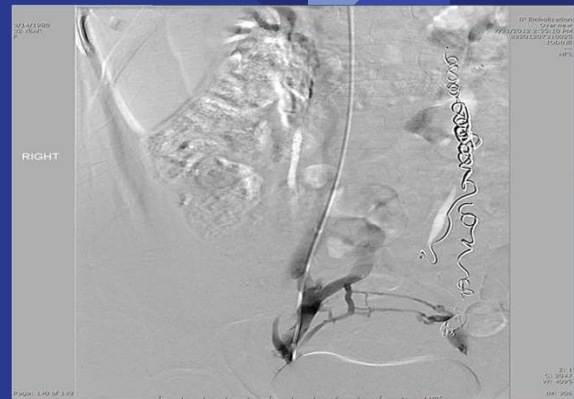
Treatment Options:

- Management:** Treatment options include observation, open surgical repair, and endovascular stenting.

Understanding Nutcracker Syndrome is essential for its timely diagnosis and appropriate management, especially in the context of pelvic congestion syndrome.

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- Perform coil embolization of the ovarian vein
- Embolize from mid-SI joint to within 1-2 cm of the renal vein
- Can use vascular plug or detachable coils at superior aspect of gonadal vein for precise placement
- Outpatient procedure
- Usually discharged home 1-2 hours
- Avoid Valsalva, vigorous activity, or heavy lifting x 3 days
- Pelvic cramping is common but responds to NSAIDs
- First menstrual cycle post treatment is usually heavy
- 80-90% experience post-embolization syndrome of fever, nausea, malaise, mild leukocytosis



Prostatic Artery Embolization PAE

Benign Prostatic Hyperplasia (BPH) and Lower Urinary Tract Symptoms (LUTS)

BPH Prevalence:

- **Common Condition:** BPH is the most prevalent benign neoplasia in males.

LUTS Incidence:

- **Common Symptoms:** Approximately half of men in their 80s will experience moderate to severe lower urinary tract symptoms (LUTS) related to BPH.

- **Endovascular embolization of the prostate blood supply by delivering embolic agents to targeted vessels using catheters**

Success Rates in Prostate Artery Embolization

Technical Success (Bilateral Embolization):

- Technical success rates range from **75% to 94.3%**.

Clinical Success (Measured by Symptoms Relief and Prostate Volume Reduction):

- **3 Months:** Clinical success is achieved in **80-97%** of cases.

- **12 Months:** This rate is **75.2%**.

- **24 and 36 Months:** Clinical success remains significant at **72.0%**.

These success rates are indicative of the effectiveness of Prostate Artery Embolization in providing symptom relief and reducing prostate volume in patients



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PAE

IPSS (International Prostate Symptom Score): A questionnaire used to assess the severity of lower urinary tract symptoms (LUTS) in men, typically related to benign prostatic hyperplasia (BPH). It helps in evaluating the impact of urinary symptoms on a patient's quality of life.

IIEF (International Index of Erectile Function): This questionnaire is used to assess male sexual function, particularly erectile dysfunction. It helps evaluate a patient's ability to achieve and maintain an erection.

QOL (Quality of Life): Quality of Life assessments are used to gauge the overall well-being and life satisfaction of patients. In the context of prostate health, it can help understand the impact of prostate conditions on a patient's daily life.

PSA (Prostate-Specific Antigen): A blood test used to measure the levels of PSA, a protein produced by the prostate gland. Elevated PSA levels can be an indicator of various prostate conditions, including prostate cancer.

Prostate MRI: Magnetic Resonance Imaging (MRI) of the prostate is a diagnostic tool that provides detailed images of the prostate gland. It is used for the evaluation of prostate conditions, including cancer, and to guide treatment decisions.

Foley Catheter: A Foley catheter is a flexible tube inserted into the bladder through the urethra to drain urine. It is often used in medical procedures, including some related to prostate health, and for managing urinary retention.



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Indications and Absolute Contraindications for Prostate Artery Embolization (PAE)

- 1. LUTS due to BPH:** Patients with lower urinary tract symptoms (LUTS) attributed to benign prostatic hyperplasia (BPH) who show no improvement with, or are intolerant to, medical treatment, such as 5-alpha-reductase inhibitors and/or selective alpha-blockers.
- 2. LUTS due to BPH with UR:** Patients experiencing LUTS due to BPH and urinary retention (UR) necessitating an indwelling catheter.
- 3. Surgical Risk Aversion:** Patients who wish to avoid the risks and adverse events associated with surgical therapies.
- 4. Prostate Cancer (with TACE):** Patients with prostate cancer for whom Transarterial Chemoembolization (TACE) is an appropriate intervention.



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Absolute Contraindications:

- **Active Urinary Tract Infection (UTI):** PAE should be avoided when a patient has an ongoing urinary tract infection.
- **Bladder Atonia:** Contraindicated if the patient has bladder atonia (loss of muscle tone).
- **Neurologic Bladder Dysfunction:** Patients with neurologic bladder dysfunction or other neurological disorders that significantly impact bladder function.
- **Large Bladder Diverticula or Stones:** Contraindicated if there are large bladder diverticula or stones requiring surgical intervention.
- **Urethral Stricture:** Patients with urethral stricture.
- **Renal Failure:** Patients with renal failure as PAE may not be appropriate in such cases.



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Post-op Mx

Recovery stay depends on closure device used

- a. Mynx: 2 hours
 - b. Angioseal: 1 hour
- Dysuria, frequency, and urgency have been observed in all patients treated by PAE and are related to ischemic prostatitis.
 - Nausea, fever in the absence of infection, urethral burning, periprostatic or pelvic pain, very small amounts of blood in urine and/or mixed in the stool with mucus for 3 to 5 days can be seen (post-PAE syndrome)
 - Monitoring include all vitals
 - Periodic inspection and palpation of the access site (Inguinal areas).
 - Communicating the postoperative expected issues.
 - Postembolization symptom control is usually achieved with nonopioid analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs).
 - Antibiotics (ciprofloxacin 500 mg 12/12 hours) and proton-pump inhibitors are also prescribed for a period of 1 week.

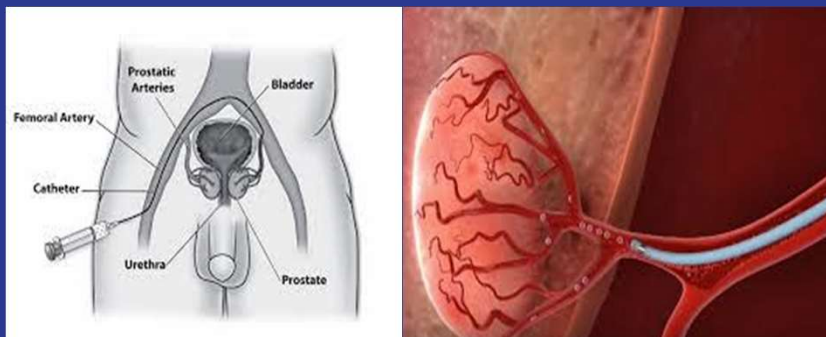


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Prostatic Artery Embolization PAE

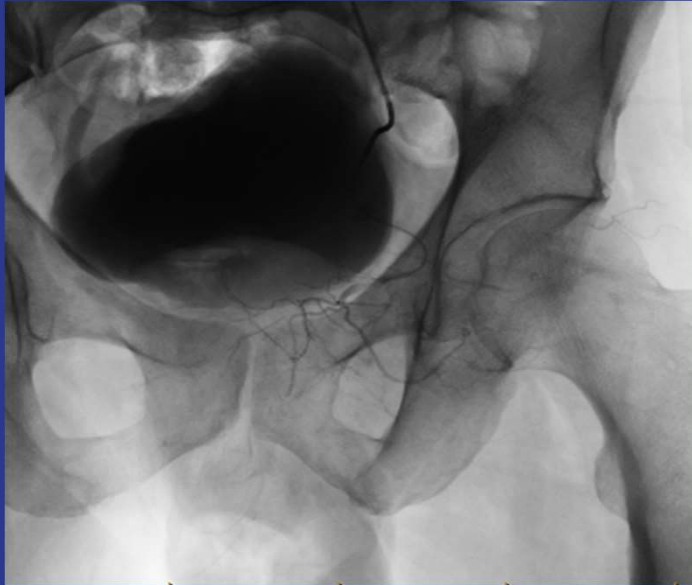
Possible Complications in Prostate Artery Embolization

- **Access Site Complications:** These may include hematoma, as well as urinary, rectal, or seminal bleeding. Typically, these complications are self-limited.
- **Urinary Tract Infection:** An infection involving the urinary tract or, in some cases, infectious prostatitis.
- **Non-Targeted Embolization:** This may lead to visceral ischemia, such as bladder wall necrosis. While rare, it is considered a significant complication.
- **Bone Infarction:** In some cases, bone infarction has been reported.
- **Radiodermatitis:** Rare instances of radiodermatitis have also been documented.



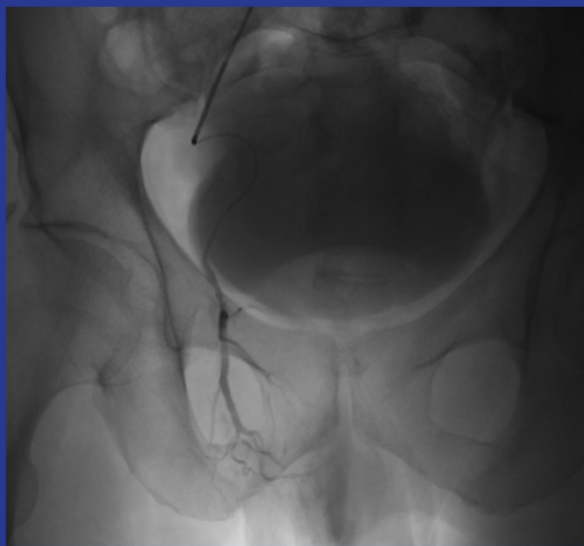
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Prostatic Artery Embolization PAE



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Prostatic Artery Embolization PAE



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Geniculate Artery Embolization GAE

Knee OA is the most common joint disorder and a leading cause of morbidity worldwide.

• **Pain:** The most common and predominant symptom in knee OA is pain.

Treatment Approach:

• Early Stages (Mild to Moderate):

• Management of early-stage OA typically involves:

- **Exercise:** Physical therapy and targeted exercises.
- **Weight Management:** Controlling body weight to reduce stress on the knee joint.
- **Pharmacotherapy:** Use of topical or oral nonsteroidal anti-inflammatory drugs (NSAIDs).
- **Additional Options:** In some cases, consider using a brace and/or intra-articular corticosteroid injections as add-on therapy.

• End-Stage OA (Severe):

• When knee OA progresses to an advanced stage, surgical intervention may be necessary. Options include:

- **Knee Joint Realignment:** Realignment procedures.
- **Uni-Compartmental Knee Arthroplasty:** Replacing only one compartment of the knee.
- **Total Knee Arthroplasty:** Replacing the entire knee joint.

Prevalence of Knee OA:

1 in 3 Americans aged 60 and older exhibit radiographic evidence of knee OA.

Symptomatic Population:

Among this group, approximately 40% experience bothersome symptoms.

Total Knee Arthroplasty (TKA):

- Following TKA, which is a common intervention for advanced OA:
- Up to 20% of patients report dissatisfaction with the procedure.
- Dissatisfaction is often attributed to persistent pain, primarily linked to synovitis



Geniculate Artery Embolization GAE

Innovative Intervention for Knee Osteoarthritis

We introduce a novel, minimally invasive, non-surgical intervention for patients with symptomatic knee osteoarthritis (OA).

This intervention is suitable for patients who:

Are refractory to other treatments but reluctant or ineligible for Total Knee Arthroplasty (TKA), particularly those with mild-to-moderate OA.
Are not surgical candidates for various reasons.

The procedure involves:

Selective catheterization of the genicular arteries responsible for supplying blood to the knee's synovial lining during an angiogram.
Precise targeting of aberrant neovascularity.

Embolization Process:

Embolization is executed by: Selective intra-arterial injection of embolic material to the specific site of knee pain. Targeting synovial arterial hypervascularity.

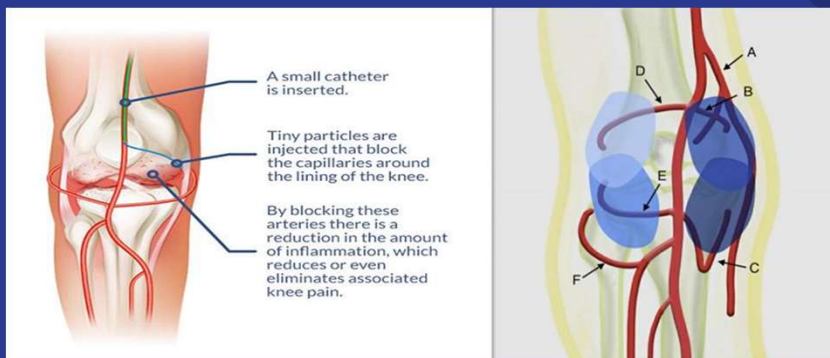
Mechanism of Action:

This innovative procedure addresses knee OA pain by: Reducing synovial blood flow. The hypothesis is that this reduction alleviates knee pain associated with inflammation, neovascularity, and neuroinnervation.



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Geniculate Artery Embolization GAE



Adverse events

transient skin discoloration
knee pain
access site hematoma
focal skin ulcer
0.1% Focal bone infarct, plantar paresthesia, fat necrosis, fever, N/V.

Postop Care

Vitals + Knee Inspection q15 minutes for 1-2 hrs until discharge depending on closure techniques/device used.



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Geniculate Artery Embolization GAE -Before



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Geniculate Artery Embolization GAE -AFTER



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Trans arterial Chemotherapy-Embolization TACE

Transarterial Chemoembolization (TACE) in Hepatocellular Carcinoma (HCC) Management


TACE as the Standard of Care:
TACE has emerged as the standard of care for patients with unresectable hepatocellular carcinoma (HCC). It is a pivotal component in all major HCC treatment guidelines.

Vascular Supply in the Liver:
The liver parenchyma primarily receives 60% to 80% of its blood supply from the portal vein. In contrast, liver tumors are primarily nourished by branches of the hepatic artery (HA).

Targeted Delivery and Parenchymal Preservation:
TACE is advantageous as it selectively delivers the chemoembolization mixture directly into the vascular bed of the tumor. This approach minimizes hepatic parenchymal injury while effectively targeting the tumor, enhancing its therapeutic benefit.

Chemotherapy:
Chemotherapy is often administered as a combination of drugs to maximize its effectiveness. A commonly used cocktail in the United States consists of:
10 mg of Mitomycin C,
50 mg of Doxorubicin, and
100 mg of Cisplatin.

Embolic Agent:
In combination with chemotherapy, an embolic agent is used to enhance treatment. This agent can be in the form of particles or Gelfoam.



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Trans arterial Chemotherapy-Embolization TACE

Primary Indication:

TACE is primarily indicated for the treatment of unresectable Hepatocellular Carcinoma (HCC).

Secondary Indications:

- Bridge to Transplant:** TACE can serve as a bridge therapy for patients awaiting liver transplantation.
- Downstage for Resection or Transplant:** It may be used to reduce tumor size to meet resection or transplantation criteria.
- Tumor Resection Aid:** TACE can assist in surgery by shrinking tumors located near major resection planes, such as the right or left portal vein.

Palliation in Advanced HCC: For patients with advanced stage HCC (BCLC stage C), TACE can provide palliative relief.

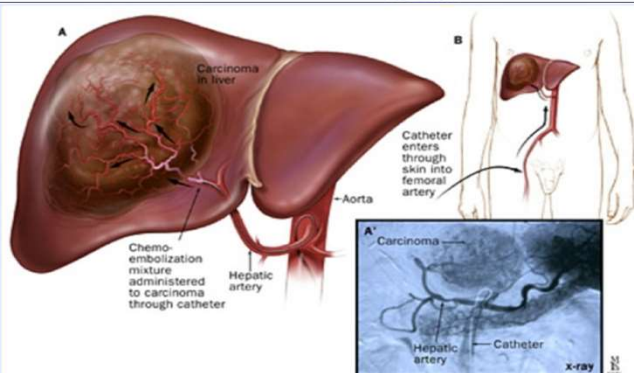
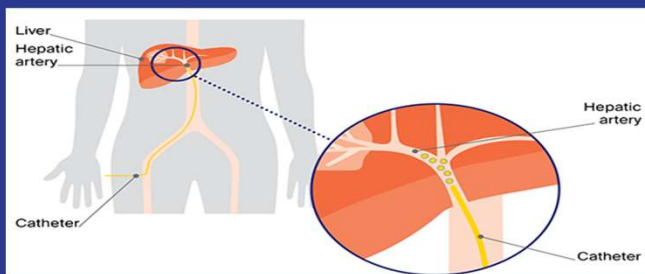
Contraindications:

- Poorly Compensated Advanced Liver Disease:** TACE is contraindicated in cases of advanced liver disease with poor compensation.
- Refractory Encephalopathy:** Patients with encephalopathy that is refractory to medical management should avoid TACE.
- Poor Performance Status:** Patients with a poor performance status may not be suitable candidates for TACE.
- Uncorrectable Bleeding Diathesis:** TACE should be avoided in individuals with uncorrectable bleeding diathesis.
- Extensive Extrahepatic Metastatic Disease:** If HCC is not the life-limiting factor, and there is extensive extrahepatic metastatic disease, TACE may not offer substantial benefits.
- Active Infection:** Active infections should be treated and resolved before considering TACE as a treatment option.



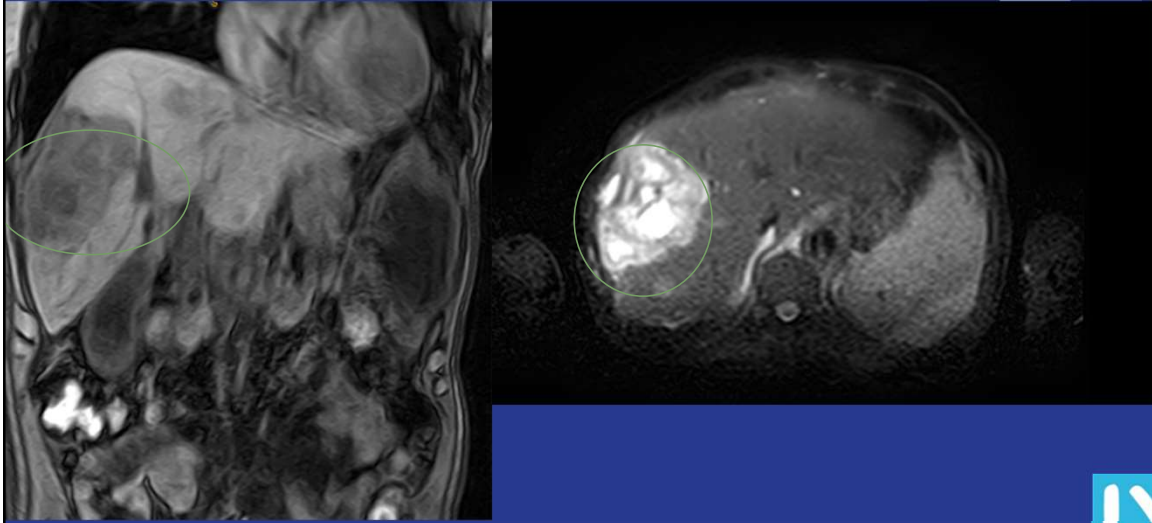
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Trans arterial Chemotherapy-Embolization TACE



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Trans arterial Chemotherapy-Embolization TACE



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Trans arterial Chemotherapy-Embolization TACE



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Trans arterial Chemotherapy-Embolization TACE



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Iliofemoral Vein and IVC Angioplasty/Stenting

Indications:

Angioplasty and stenting are employed to treat the following conditions:
Iliofemoral Vein/Inferior Vena Cava (IVC) Obstructions
May-Thurner Syndrome (Iliofemoral and IVC Obstructions)
Residual Obstruction after Balloon PTA and Extrinsic IVC Compression

Patency Rates:

Primary Patency Rates in iliofemoral venous angioplasty and stenting:

6 months: 88%

12 months: 78.3%

24 months: 78.3%

Secondary Patency Rates for the same time durations:

6 months: 100%

12 months: 95%

24 months: 95%



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Symptoms of Obstruction:

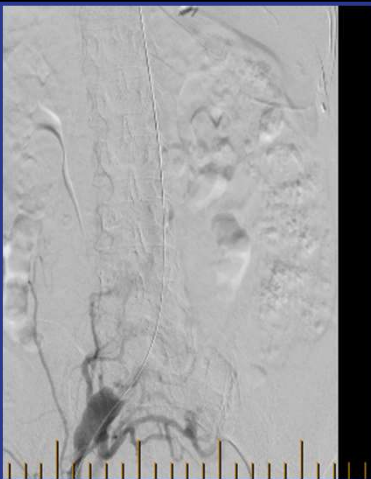
- IVC stenting is recommended when patients experience:
- Feelings of heaviness in the lower limb.
- Open sores (ulcers).
- Pain.
- Skin discoloration.
- Swelling.
- Varicose veins.

Chronic Venous Occlusion:

- For cases of chronic, occlusive deep venous thrombosis (DVT) and post-thrombotic syndrome, symptoms may include:
- Pain and heaviness.
- Limb swelling.
- Delayed wound healing.
- Ulcers.
- Varicosity.
- Skin changes, discoloration, and eruptions, sometimes accompanied by hair loss.



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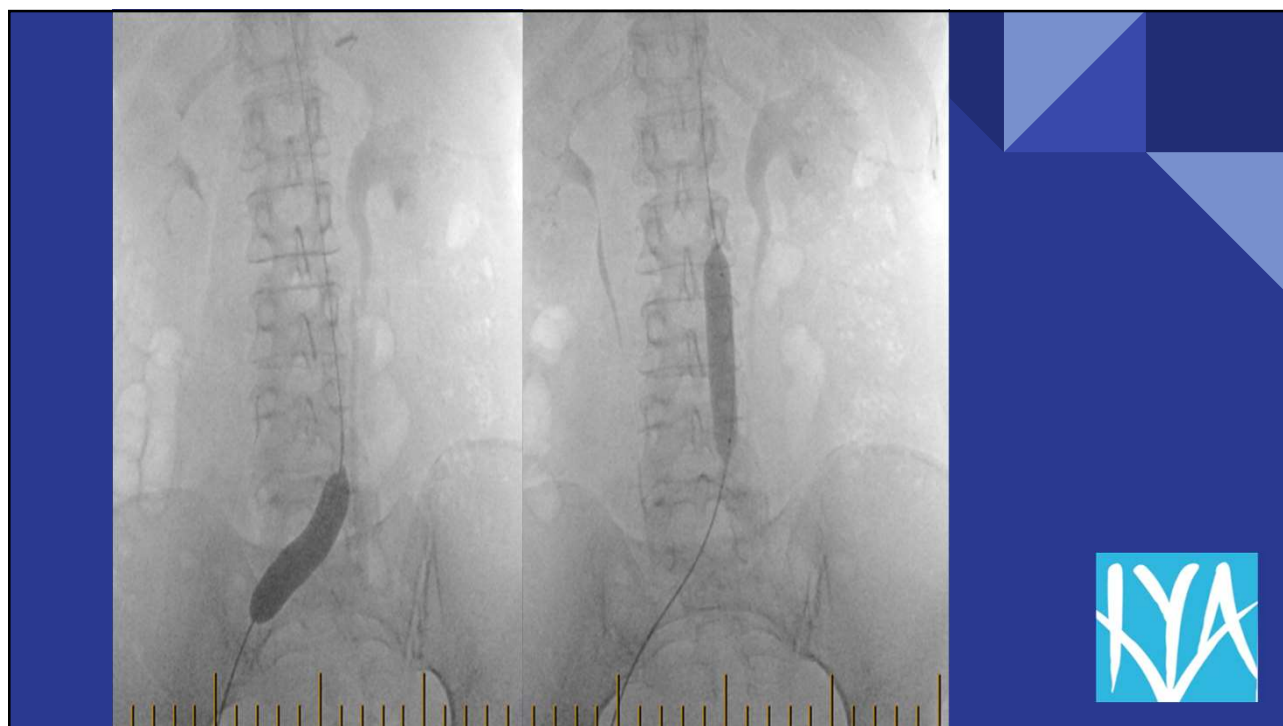
No flow in the Left Common and External Iliac veins

Complications

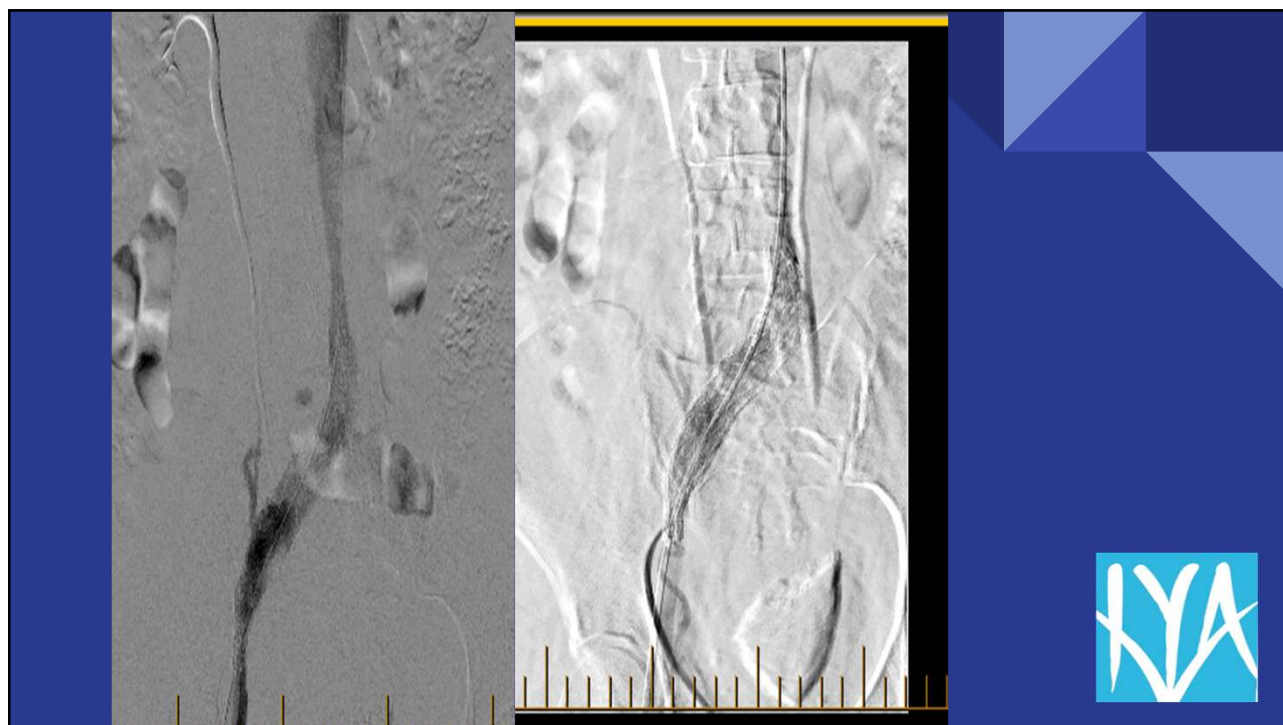
1. Bleeding from the puncture site is the most common
2. Thrombosis at the angioplasty site
3. Vein rupture



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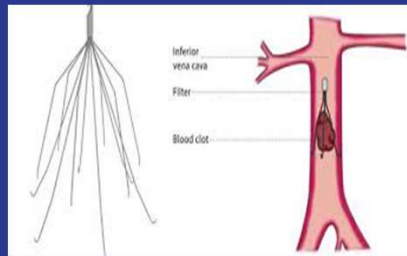
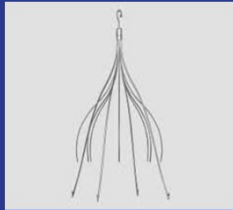
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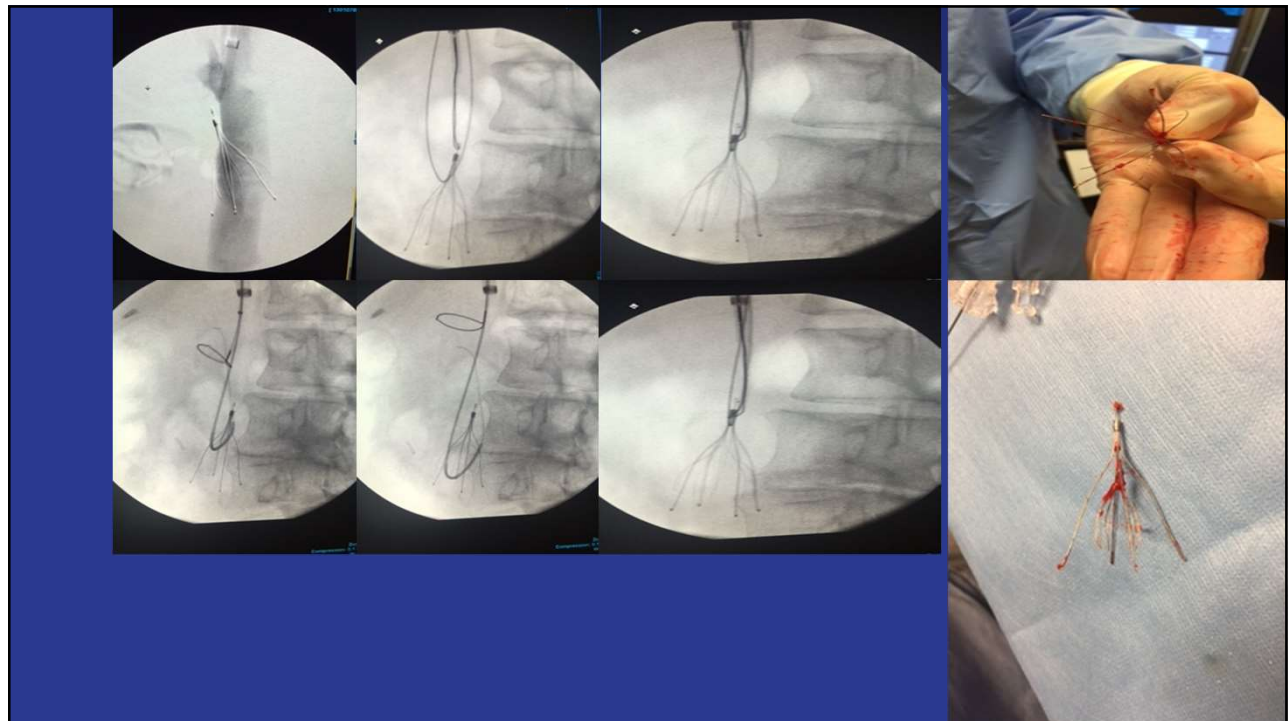
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IVC FILTER PLACEMENT AND RETRIEVAL

- MOST CAN BE REMOVED WITHIN ONE YEAR
- IVC FILTER USED TO PREVENT PULMONARY EMBOLUS SINCE 90% of PE is caused by lower extremity DVT.
- Multiple IVC filters are approved to be used in the US.
- **Celest** platinum By Cook, **Denali** Bard IVC filter, **Optease** By Cordis (SHOULD NOT BE USED. High tendency to thrombose. Retrieval failure rate is high)



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Venogram with thrombolysis and thrombectomy

- Treatment of Acute and Subacute Deep Vein Thrombosis (DVT)
- Outpatient Setting for Convenience
- For cases of DVT:
- If the thrombosis is **below the knee**, consider medical treatment and schedule a follow-up in two to four weeks.
- For extensive occlusive DVT **above the knee**, the recommended approach is to perform a venogram and thrombectomy



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- Using minimal amount of local TPA 4-6 mg local TPA in the affected region.
- Thrombectomy performed using 6 or 8 french guiding catheters.
- follow up in 4-6 weeks

- @IYA MEDICAL
- 1751 Patients treated in 24 months
- 1423 Treated with thrombolysis and thrombectomy and IVC filter placed and removed successfully
- 328 Treated with thrombolysis and thrombectomy without IVC filter



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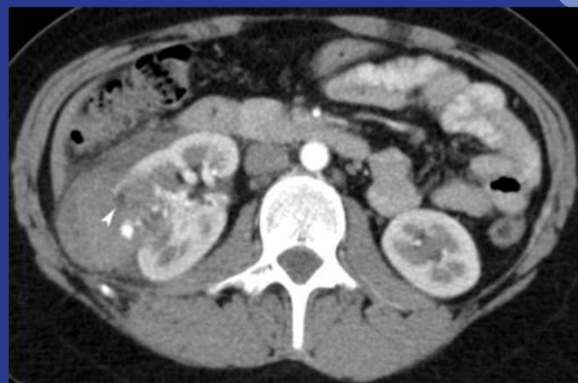
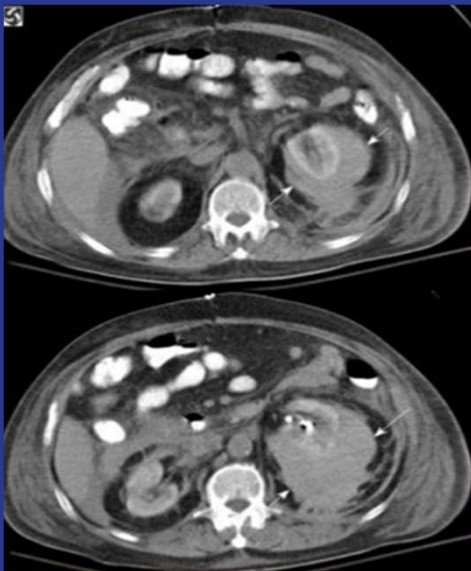
NEPRHOLOGICAL PROCEDURES

- RENAL BIOPSIES
- RENAL CANCER CRYOABLATION
- RENAL CANCER THERMAL ABLATION
- SELECTIVE ARTERIAL EMBOLIZATION
- KIDNEY STONE MANIPULATION
- PERCUTANEOUS NEPHROSTOMY TUBE PLACEMENT
- RENAL ARTERY ANGIOPLASTY & STENTING
- URETERAL STENT PLACEMENT & EXCHANGE



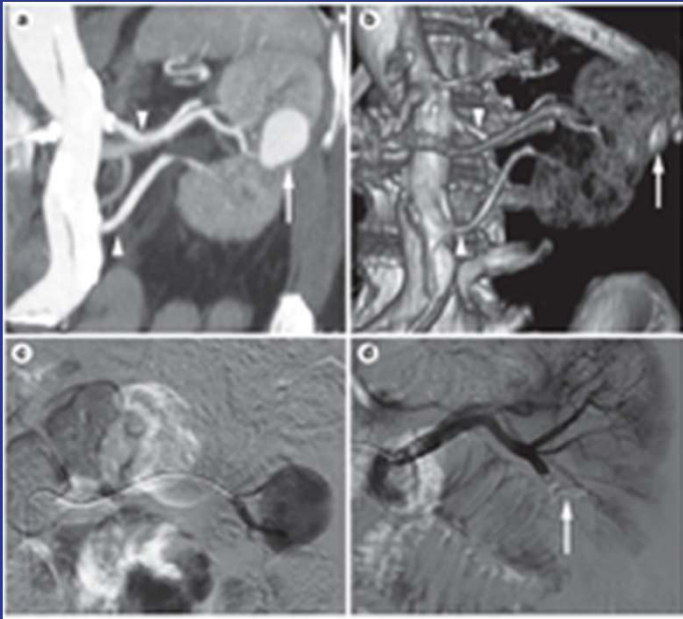
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Perirenal hematoma



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Post Bx **Pseudoaneurysm**

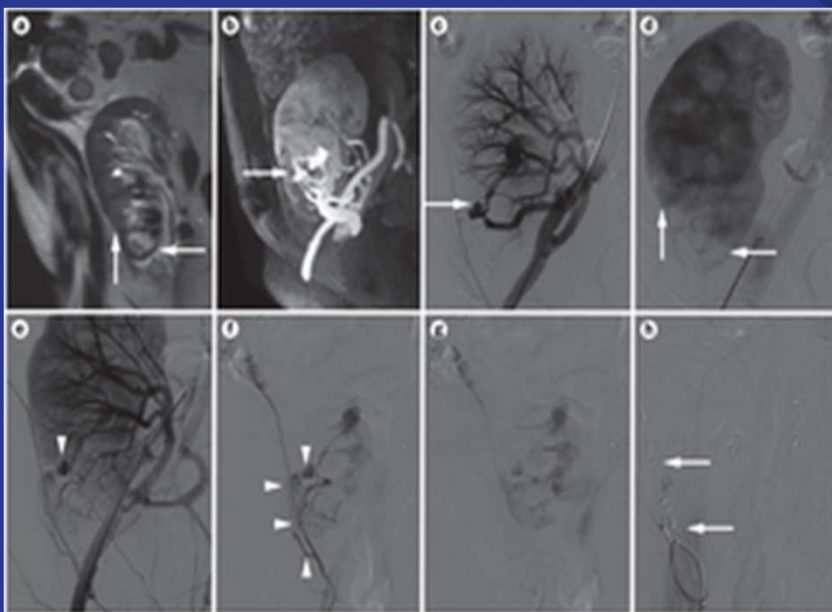


Nature Reviews | Nephrology



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AV fistula post multiple biopsies



Nature Reviews | Nephrology



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Cryoablation

Mechanisms of Cryoablation

Cryoablation Effects:

Cryoablation induces cellular damage, cell death, and tissue necrosis through two primary mechanisms:

Direct Mechanisms:

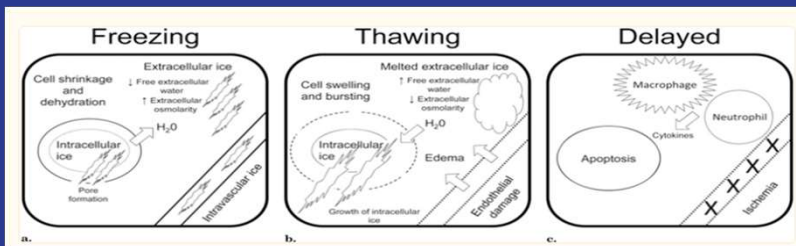
Cold-induced injury directly affects and damages cells, leading to tissue destruction.

Indirect Mechanisms:

Cryoablation also influences the cellular microenvironment, creating changes that impair tissue viability.

Percutaneous Cryoablation:

In percutaneous cryoablation, cryoprobes are guided into malignant tissue through imaging assistance. This method enables the precise application of cryoablation for therapeutic purposes.



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Cryoablation

Advantages of Cryoablation

Real-Time Monitoring:

A primary advantage of cryoablation over other thermal ablation techniques is the ability to monitor the ablation zone in real time during the procedure.

Less Painful Procedure:

Cryoablation is typically less painful than heat-based thermal ablation techniques, such as microwave or radiofrequency ablation. This is due to the anesthetic effect provided by the cooling of tissues and nerves.

Lower Complication Rate:

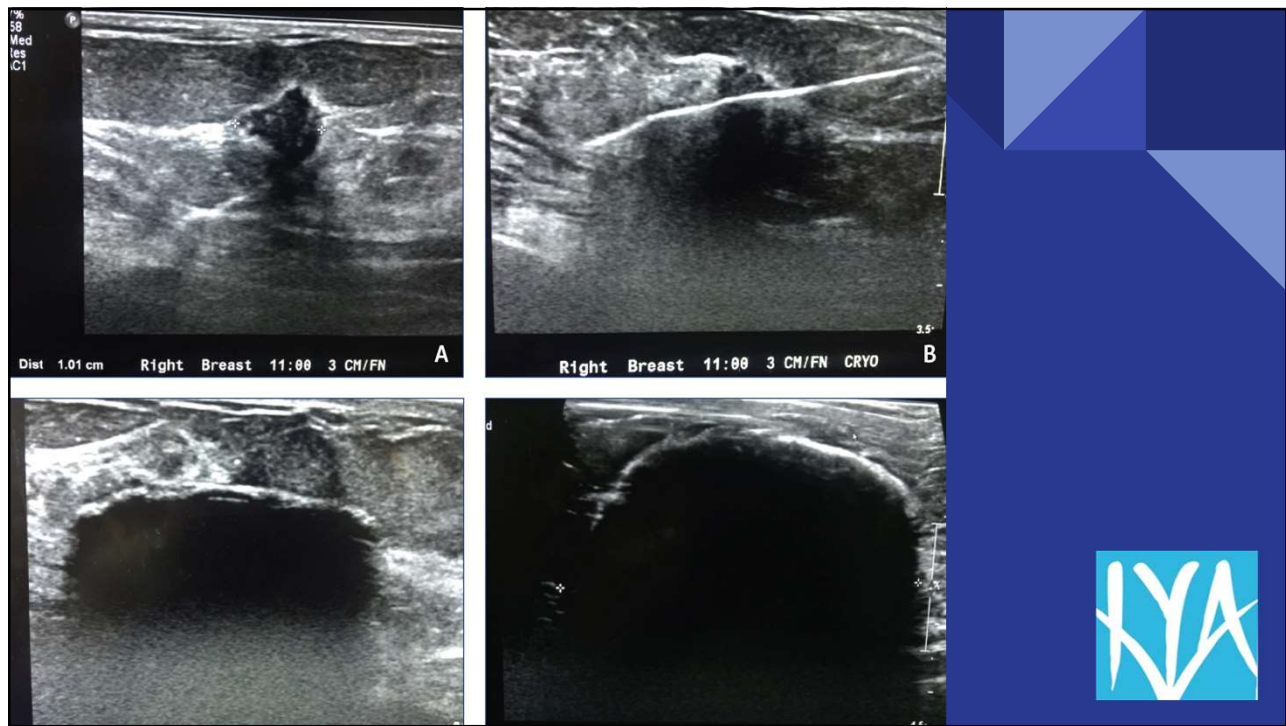
Cryoablation has shown a lower complication rate when compared to radiofrequency ablation in the treatment of renal cell cancer.

Indications:

Renal cancer
Head & Neck Squamous
Cell Cancer
Primary Bone cancer
Prostate Cancer

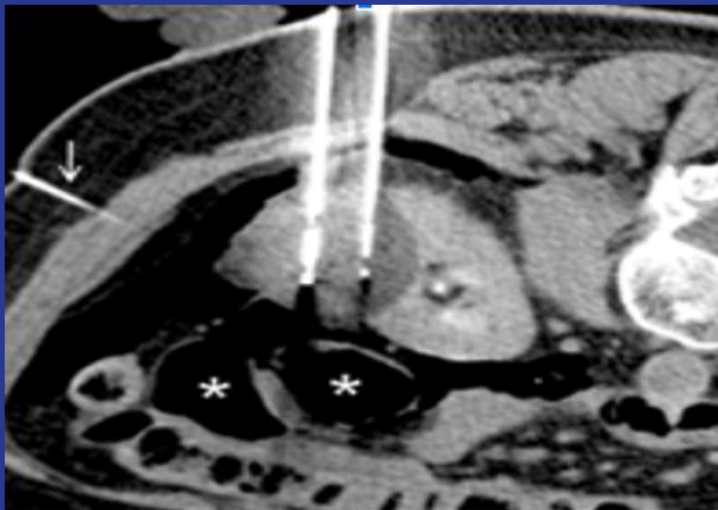
- Cryoablation preserves the cancer tissue proteins and Antigen, unlike thermal ablations, thus, allows an immune response to the tissue.
- This enables an autoimmune robust response to the cancerous tissue

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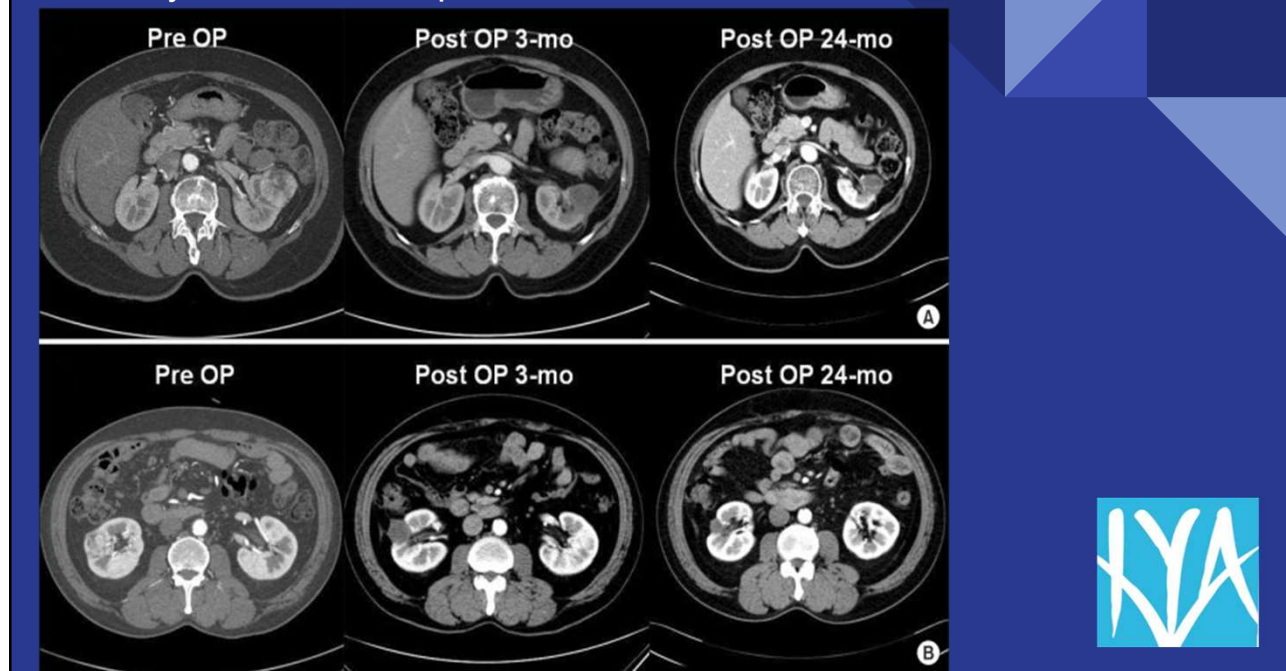
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Cryoablation: Complete resolution of RCC



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Cryoablation: Complete resolution of RCC



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Kyphoplasty: Minimally Invasive Vertebral Body (VB) Fracture Treatment

- Kyphoplasty is a safe and highly effective minimally invasive procedure used to treat patients suffering from back pain. It is particularly valuable for those with osteoporotic and tumor-related vertebral body (VB) compression fractures, as well as hemangiomas.
 - An inflatable bone tamp (balloon) is carefully inserted into the vertebral body.
 - The balloon is inflated within the VB, compacting the bone and creating a cavity.
 - Bone cement is then injected into the cavity under real-time image guidance.
 - Kyphoplasty is a valuable intervention for relieving pain and restoring vertebral body integrity in patients with compression fractures.
- Success in Kyphoplasty is characterized by achieving significant pain relief and/or improved mobility.
- In patients with osteoporosis, Kyphoplasty demonstrates success rates of up to 96%.
- For cases with **neoplastic** involvement, Kyphoplasty can yield success rates as high as 100%.
- To qualify for Kyphoplasty, patients must meet specific criteria:
- Clinical and Radiological evidence of a Vertebral Compression Fracture, which is at least 3 weeks old or older. Diagnosis can be confirmed through methods such as Magnetic Resonance Imaging (MRI).
- In cases where MRI is contraindicated, nuclear medicine bone scans can be used to localize symptomatic levels amenable to treatment.
- Additionally, Computed Tomography (CT) and Plain films (X-ray) may be performed as a minimum requirement for diagnostic assessment.

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Kyphoplasty

• Contraindications

- **Asymptomatic VB Compression Fractures:** Intervention may not be necessary for fractures that are asymptomatic and not causing discomfort or functional limitations.
- **Patient Improving on Medical Therapy:** If a patient is experiencing improvement in symptoms with medical therapy, invasive intervention may be unnecessary.
- **Ongoing Local or Systemic Infection:** Active infections may require treatment and resolution before considering other interventions.
- **Retropulsed Bone Fragment with Myelopathy or Neurologic Symptoms:** In cases where a retropulsed bone fragment results in myelopathy or neurological symptoms, intervention may be warranted.
- **Spinal Canal Compromise Due to Tumor-Related Myelopathy:** Spinal canal compromise caused by tumors, leading to myelopathy, may necessitate intervention.
- **Uncorrectable Coagulopathy:** If a patient has an uncorrectable coagulopathy, certain interventions may not be feasible.
- **Allergy to Bone Cement or Opacification Agent:** Allergies to substances used in the procedure can be a contraindication for certain interventions.

Complications

- a. The most common complication is cement extravasation 10%
- b. Clinically significant complications are rare:
 - (1) Delivery of cement into the spinal canal resulting in partial motor loss
 - (2) Anterior cord syndrome associated with an extra-pedicular approach
 - (3) Cement pulmonary embolus



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Kyphoplasty



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Kyphoplasty

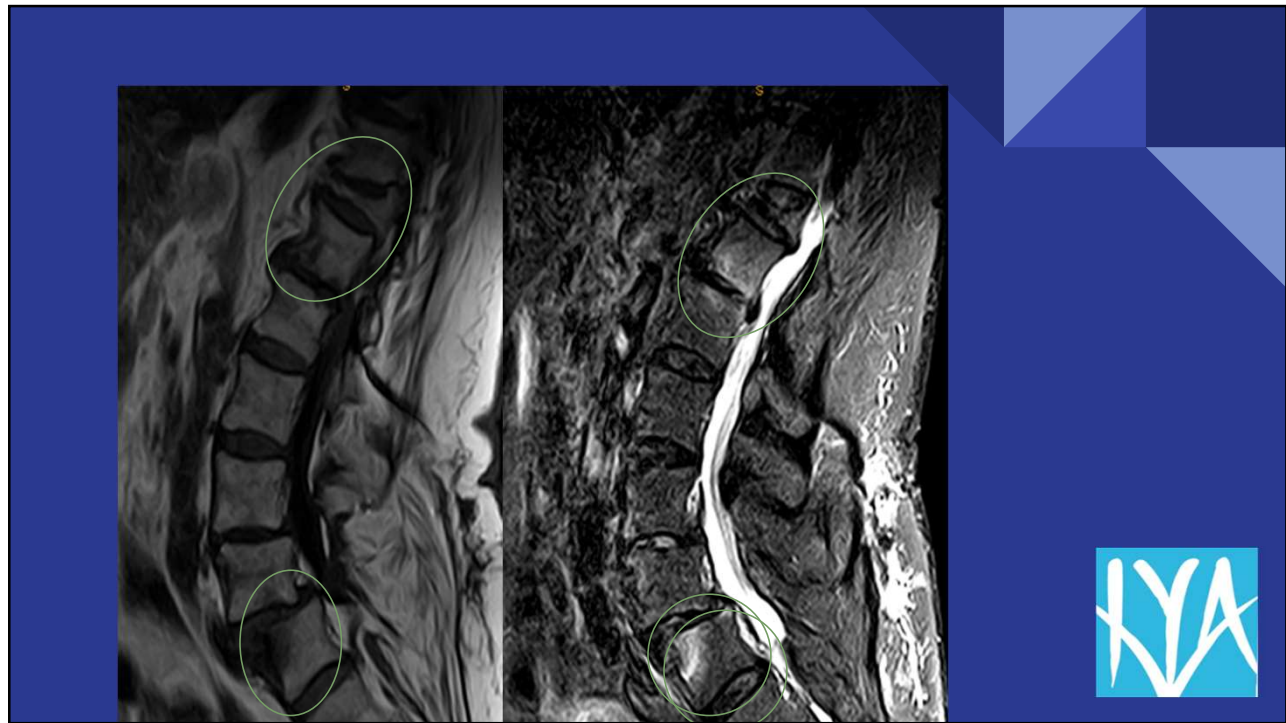


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Kyphoplasty



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Nerve blocks

Lumbar radiculopathy is defined as the objective loss of sensory and/or motor function as a result of a connection block in the axons of a spinal nerve or its roots

Nerve blocks can be done with I. Injections II. RF Ablation

Indications

- I. Selective nerve root block
 - a. Diagnostic workup for back pain
 - b. Temporary pain relief of radiculopathy in those with
 - (1) Disc herniation
 - (2) Recurrent radiculopathy after discectomy
- II. Epidural steroid injection
 - a. Temporary relief of radiculopathy
 - b. As a diagnostic tool to determine type and level of surgical treatment
 - c. Symptoms related to a nerve root but no definite radiologic diagnosis explaining the symptoms

Contraindications

Absolute

1. Coagulopathy
2. Systemic or local infection
3. Pregnancy
4. Technical inability to target the nerve root

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Nerve blocks

Results

1. Diagnostic blocks with only local anesthetic may be effective within minutes; steroid within several days, maximal after 7 days.
2. Therapeutic blocks have a mean duration of 3 to 6 months.

Complications

1. General

a. Infection; b. Bleeding; c. Transient headache; d. Transient lower extremity weakness or paresthesia; e. Thecal sac puncture; f. Steroid side effects:

- (1) Glucose disturbance
- (2) Sleeplessness/insomnia
- (3) Aggressive behavior/mood disturbance
- (4) Transient decrease in immunity

2. Nerve root blocks

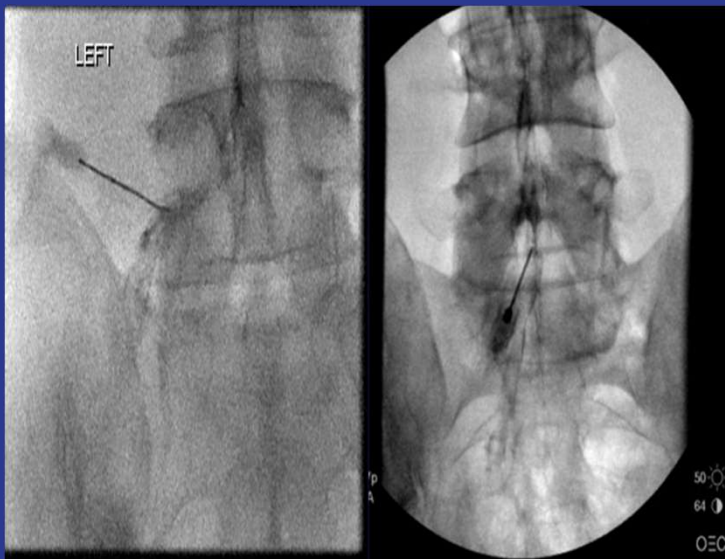
- a. Direct nerve root injection may result in severe sustained radicular pain.
- b. Intravascular injection of steroid: thrombosis

3. ESIs

- a. Dural puncture: 7% incidence. b. Epidural hematoma



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Sacroiliac Joint Injection

Discomfort originating from the sacroiliac (SI)

Clinically, patients with pain suspected to be originating from the SI joint(s) complain of unilateral pain (although it may be bilateral), with no evidence of arthropathy.

They may have sitting intolerance, groin pain, or referred numbness, tingling, or burning in the lower extremity and buttock region

Indications

1. Diagnostic
2. Therapeutic: a. Inflammatory; b. Degenerative

Complications

1. Infection; 2. Bleeding; 3. Lower extremity weakness or paresthesia (transient); 4. Difficulty voiding (transient)

Results

1. 90% have pain relief within 12 hours
2. 50% having immediate pain relief
3. Longer period of symptomatic relief, averaging approximately 10 months



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Nerve blocks: SI joint/Sciatica



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Spinal Facet Procedures

Facet-mediated pain can account for a significant percentage of people with back pain.

Facet joint disease may be aggravated by superimposed spinal degenerative conditions, such as disc height loss, or by asymmetric spinal loading as seen in scoliosis or spondylolysis

In facet degenerative change, there is poor correlation between imaging and clinical symptoms.

Magnetic resonance imaging (MRI), CT, and other imaging modalities are best considered as methods to assess for other contributors of back or neck pain.

Through careful clinical evaluation, including assessing the point of maximal tenderness to palpation, as well as the cutaneous distribution of the pain, determination of the culprit facet joint(s) can be made.

The two major types of facet procedures are:

- intra-articular injections
- medial branch blocks (MBB)

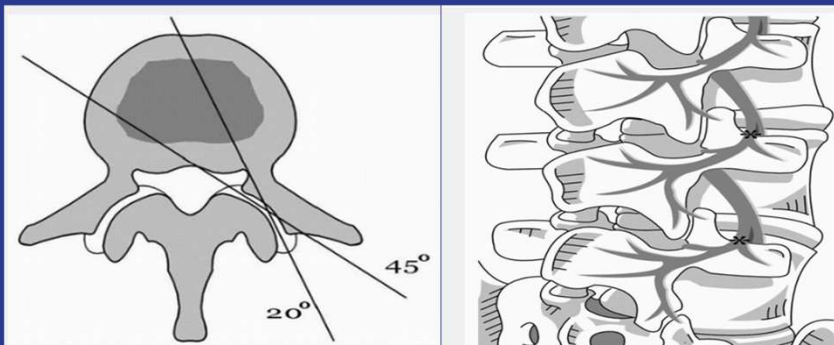


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Spinal Facet Procedures

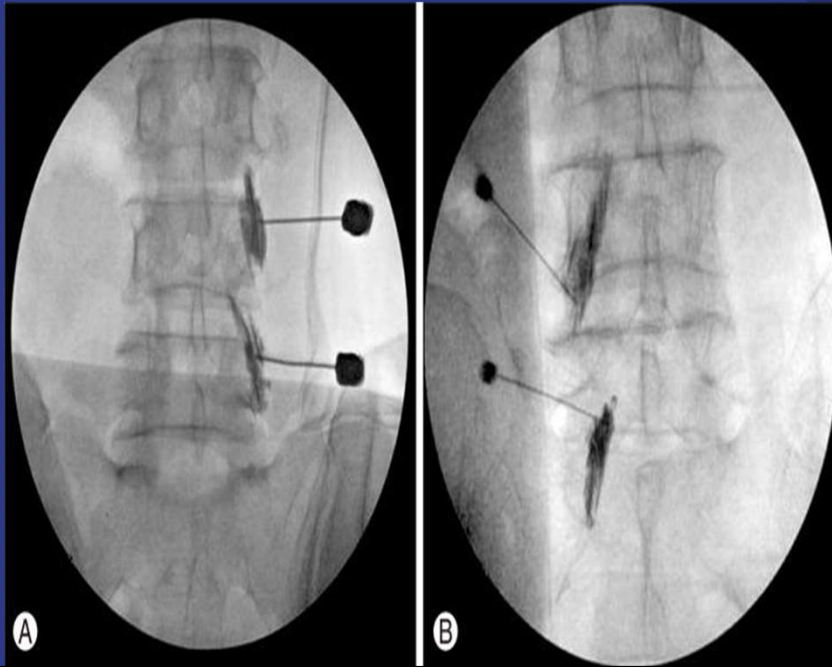
Indications

1. Back or neck pain consistent with a facet syndrome
2. Complex spinal axis pain felt to have a facet mediated component
3. Management for those having failed other spine-directed procedures, such as vertebroplasty, nerve root block, or epidural steroid injection



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Spinal Facet Procedures



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Venous ablation

Varicose veins are enlarged and tortuous veins, affecting up to one-third of the world's population.

They can be a cause of chronic venous insufficiency

Characterized by oedema, pigmentation, eczema, lipodermatosclerosis, atrophie blanche, and healed or active venous ulcers.

They can cause pain, burning discomfort, aching, and itching as well as generalized aching.

Varicose vein disease can affect quality of life as it is cosmetically unattractive, can cause phlebitis, bleeding, skin pigmentation, and ulcers.



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Varicose vein treatment options include:

1. Conservative treatments (stockings, lifestyle modifications, sick leave, and medications)
2. Variety of surgical interventions.
3. Surgery is commonly used to treat 'main stem' varicose veins (where the vein is stripped).

4. Endovascular procedures:

- a. Radiofrequency ablation therapy
- b. Sclerotherapy.

radiofrequency ablation therapy use specific catheter devices to heat and cause thrombotic and fibrotic closure damaging the endothelium and the inner media.

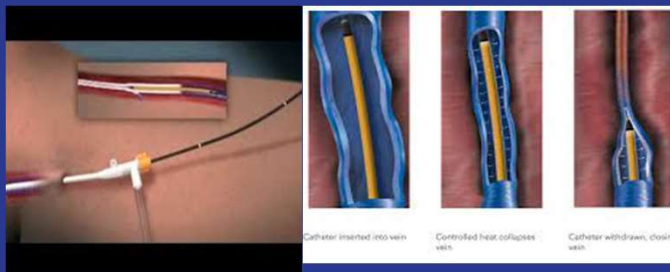
Sclerotherapy is another endovascular procedure that aims to obliterate the varicose veins using liquid or foam preparations injected inside the lumen of the varicose vein.



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Complications

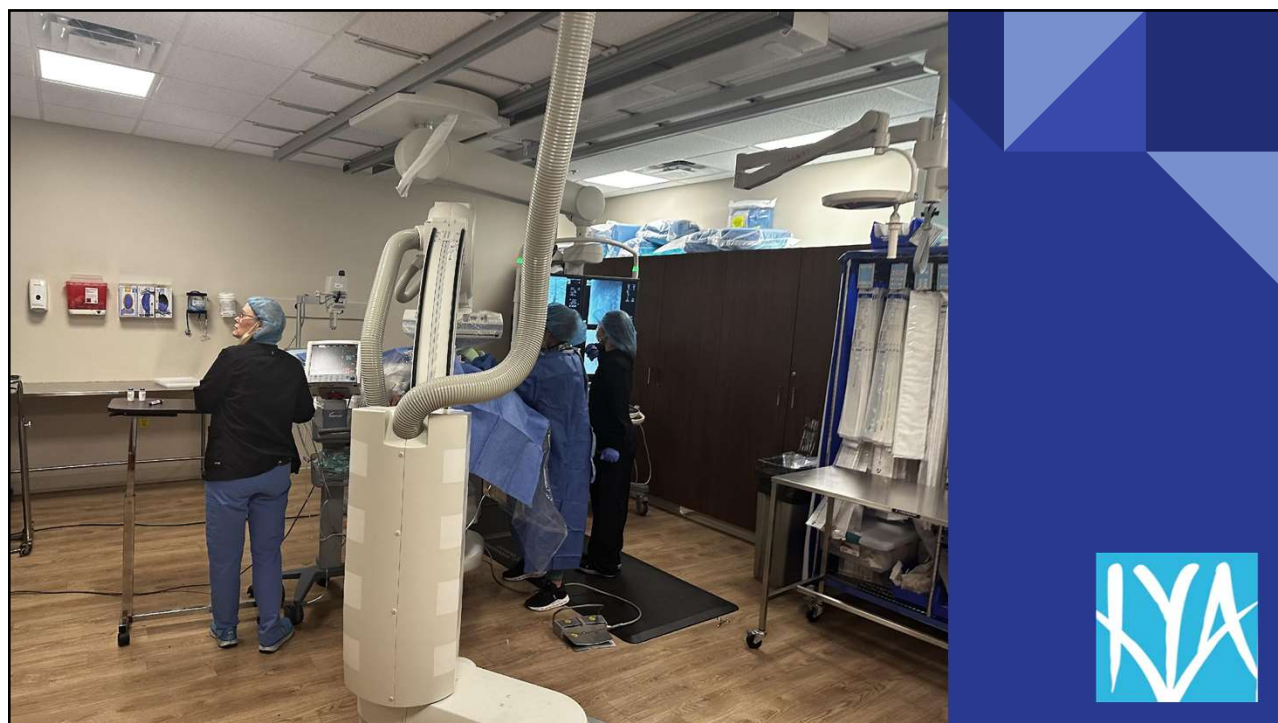
1. hematoma formation, skin pigmentation, ulceration and necrosis, superficial thrombophlebitis
1. thromboembolic complications (deep vein thrombosis and pulmonary embolism as defined by the authors of primary studies)
1. anaphylactic reaction



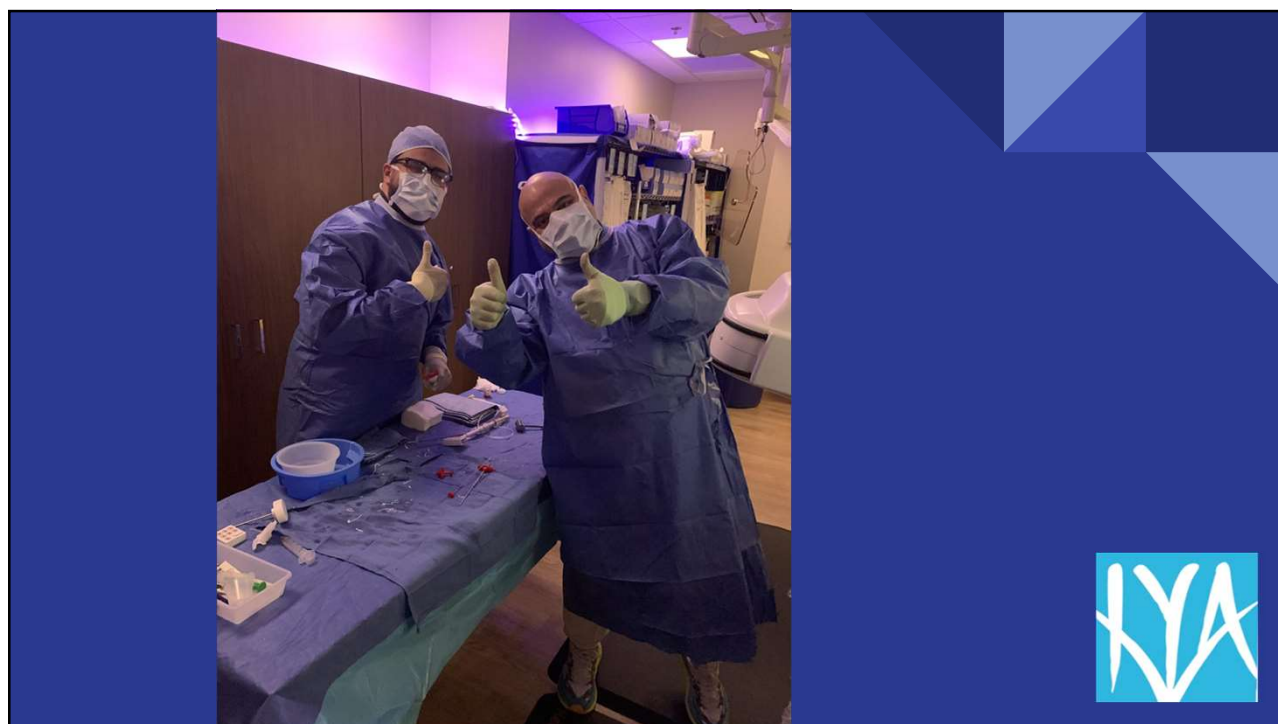
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@ IYA MEDICAL

378 patients in two years

253 patients pain relief in three weeks

118 improved in 8-10 weeks

3 repeat embolization

4 no significant change

A photograph of the exterior of the AGHA Medical Imaging & Surgery building. The building is a modern, multi-story structure with large windows and a sign in the foreground that reads "AGHA MEDICAL IMAGING & SURGERY" and "14901".

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