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RESEARCH QUESTION

Can duplex ultrasound or venography be used to detect May-Thurner Syndrome (MTS) and other pelvic vein compression syndromes at an earlier stage of disease for adults with lower extremity leg pain and edema?

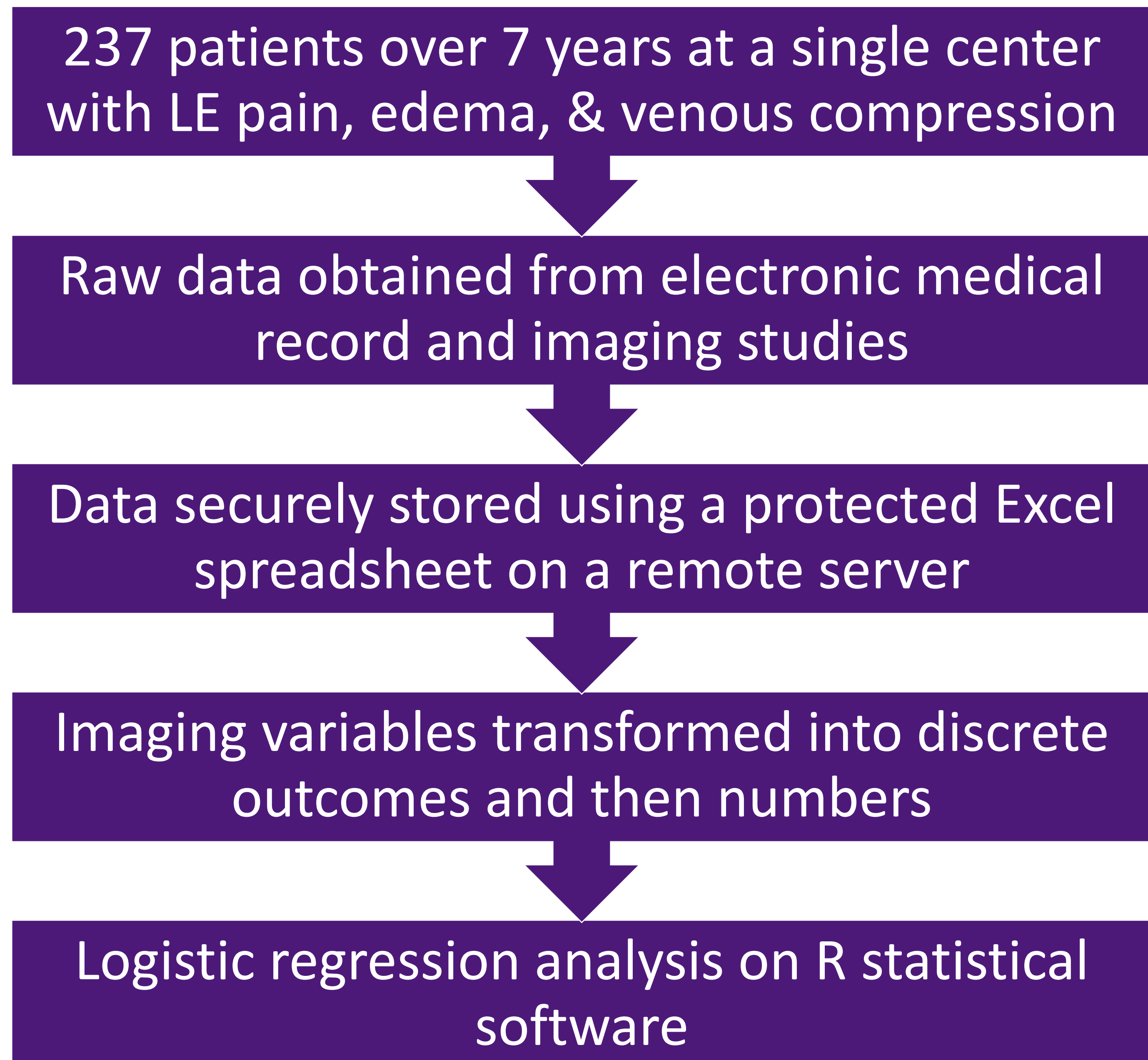
BACKGROUND

- Classical MTS is left CIV compression
- Changes in biofluid mechanics contribute to vascular pathology and clinical sequelae

$$\tau = \eta\gamma = \eta \frac{dv}{dz}$$

- τ = shear stress, η = viscosity, γ = shear rate, $\frac{dv}{dz}$ = velocity change / point distance change
- Endothelial plasma membrane stressors → cellular injury → neointimal hyperplasia → ↑ shear stress, ↑ turbulent flow, ↓ venous outflow → venous hypertension
- Absence of reliable non-invasive diagnostic imaging delays appropriate care

METHODS



Patients with lower extremity leg pain and edema may be diagnosed with May-Thurner Syndrome and other pelvic vein compression syndromes at an earlier stage of disease using duplex ultrasound.

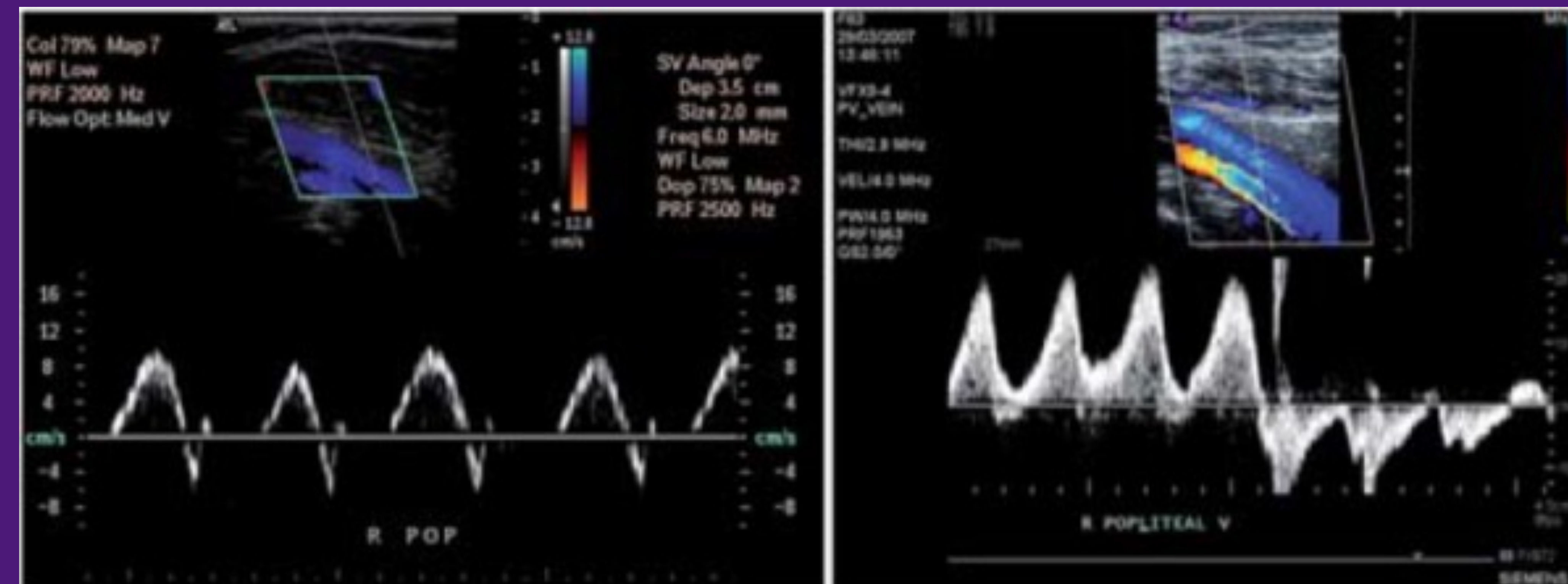


Figure 1. Duplex Ultrasound of the popliteal vein. Left: Normal popliteal vein. Right: Incompetent popliteal vein

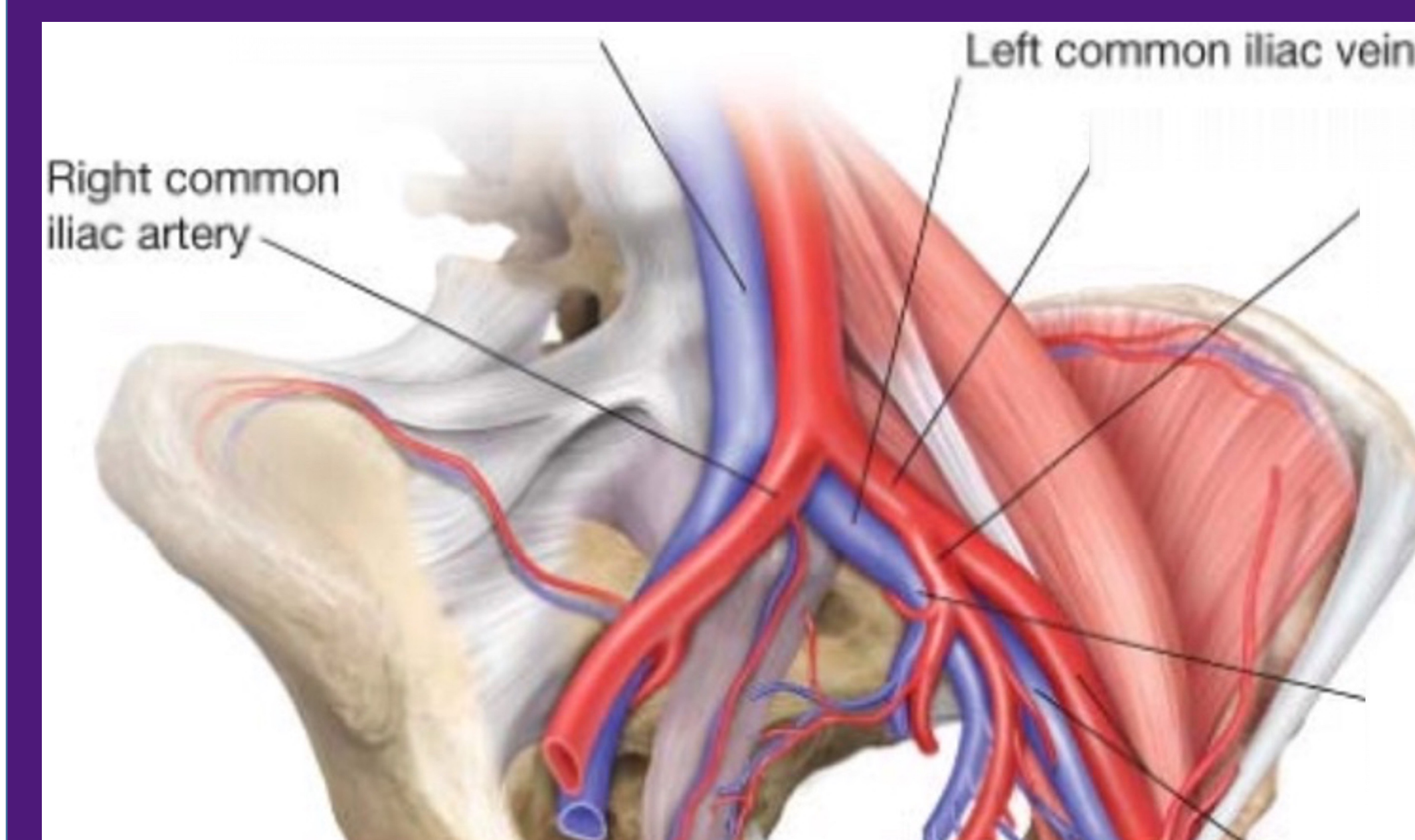


Figure 2. Normal pelvic vascular anatomy relevant to MTS pathology

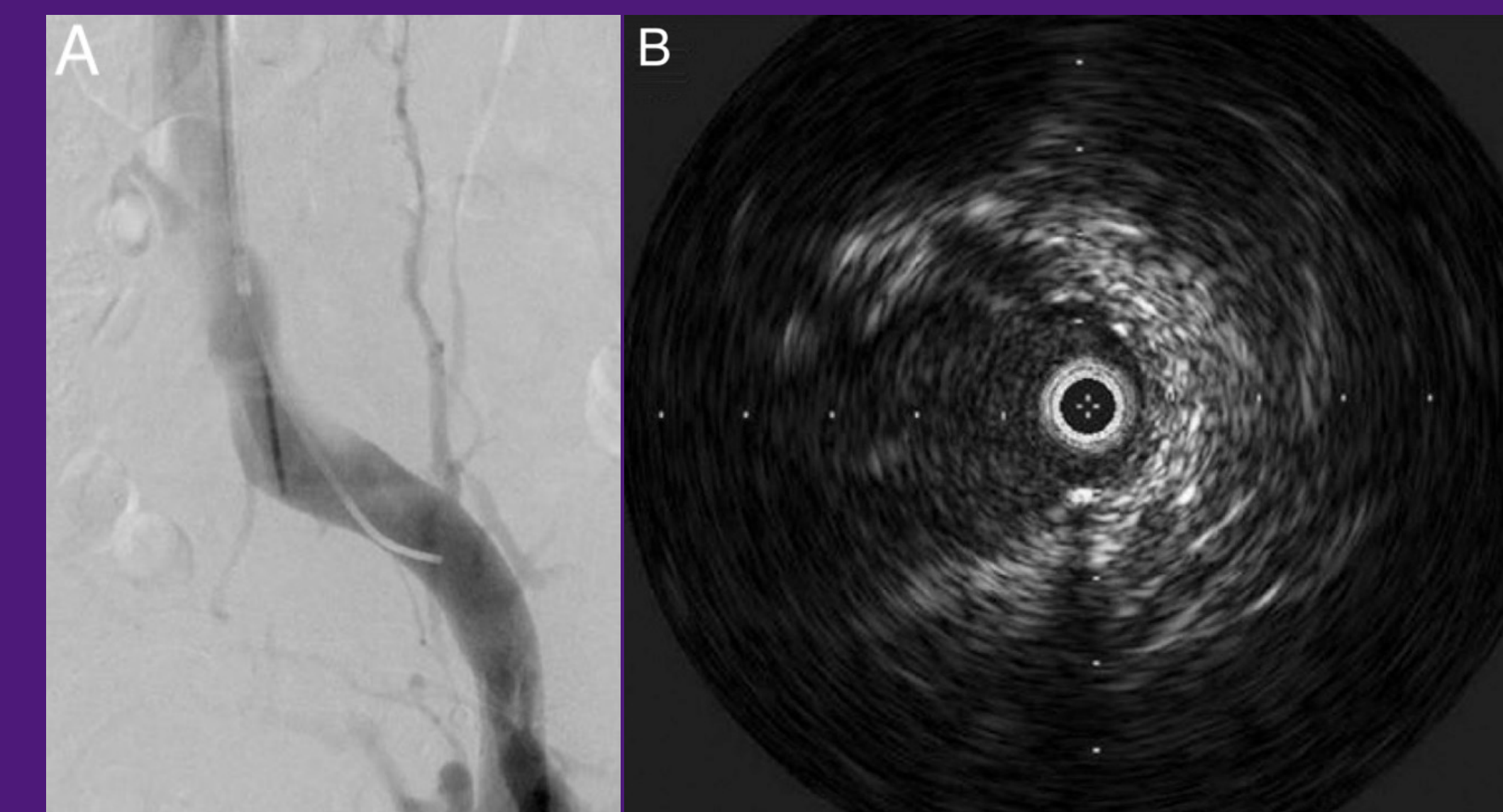


Figure 3. A) Venography showing stenotic left CIV. B) IVUS showing a portion of same stenotic segment.

RESULTS

Duplex Ultrasound to Venography Analysis

Left p-value = 0.0245*		CFV Ultrasound Compressibility	
		Normal	Reduced
Venography	<50% Stenosis	101	2
	≥50% Stenosis	56	7

Right p-value = 0.0135*		CFV Ultrasound Compressibility	
		Normal	Reduced or Absent
Venography	<50% Stenosis	81	1
	≥50% Stenosis	52	9

Right p-value = 0.0325*		CFV Ultrasound Spontaneity	
		Normal	Reduced, Absent, or Pulsatile
Venography	<50% Stenosis	69	13
	≥50% Stenosis	42	19

- ↓ compressibility at L CFV on duplex US predicts ≥50% stenosis on venography
- ↓ or absent compressibility at R CFV on duplex US predicts ≥50% stenosis on venography
- ↓, absent, or pulsatile spontaneity at R CFV on duplex US predicts ≥50% stenosis on venography

Duplex Ultrasound to IVUS Analysis

Left p-value = 0.008**		CFV Ultrasound Competency	
		Normal	Reduced
IVUS	<50% Stenosis	34	28
	≥50% Stenosis	63	20

- Normal competency of left CFV on duplex ultrasound predicts ≥50% stenosis on IVUS

FUTURE DIRECTIONS

- Prospective multi-center study correlating refined imaging to the presence of MTS
- Post-intervention clinical outcomes for patients diagnosed with MTS using refined imaging



Thesis



ePoster