Outcomes And Predictors Of Failure Of Iliac Vein Stenting

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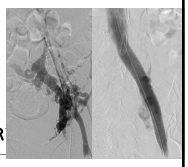


Disclosures

I was a site PI for the Zilver Vena VIVO clinical trial and the VIVID iliac vein stent trial

Iliac Vein Stenosis

- Stent liberally / Use IVUS
  - Use large appropriately sized stents
  - Land in healthy proximal and distal zones
  - Extend into the IVC and below the inguinal ligament (if needed)
  - Supported by current guidelines (SVS, AHA, SIR)

UPMC experience

Objectives

Assess outcomes and predictors of iliac vein stent failure after acute DVT thrombolysis and stenting

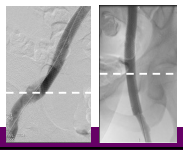

CLINICAL RESEARCH STUDIES

Outcomes and predictors of failure of iliac vein stenting after catheter-directed thrombolysis for acute iliofemoral thrombosis

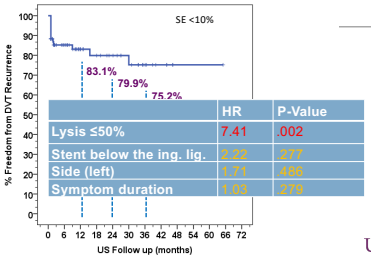
JVSVL 2019

Methods

- Retrospective Study
  - Consecutive patients 5/2007 – 9/2017
    - DVT thrombolysis & stenting. 142 lysed, 73 stented

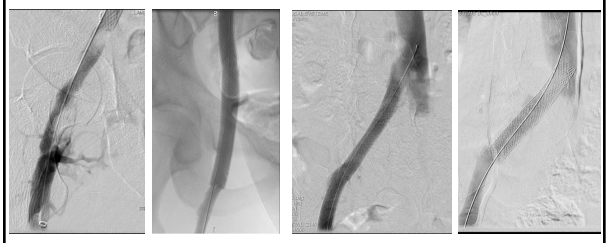


Primary Patency



	HR	P-Value
Lysis ≤50%	7.41	.002
Stent below the ing. lig.	2.22	.277
Side (left)	1.71	.486
Symptom duration	1.03	.279

Stent Liberally / Land in healthy zones



Neglen et al J Vasc Surg 2008 Rollo JC et al J Vasc Surg VL 2017 Avgerinos et al J Vasc Surg VL 2017

Stenting across the inguinal ligament Wallstent data (venous indication)

Contrary to arterial stenting, stents can be safely placed across the inguinal crease with minimal risk of stent fractures, and minimal effect on long-term patency.

Patency rate is

- -not related to the length of stented area or the placement of the stent across the inguinal ligament
- -dependent upon the etiology and whether the treated post-thrombotic obstruction is occlusive or not.

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Neglen P et al. Venous stenting across the inguinal ligament J Vasc Surg 2008;48:1255-61

New stent designs

Improved flexibility

Improved radial force

Improved crush resistance

Lower profile, predictable deployment

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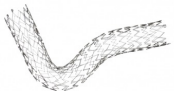
New Generation Venous Stents

VENOVO BARD

ZILVER VENA COOK MEDICAL



ABRE MEDTRONIC

- Predictable deployment
- Higher radial force
- Uniform radial force
- Longer stents

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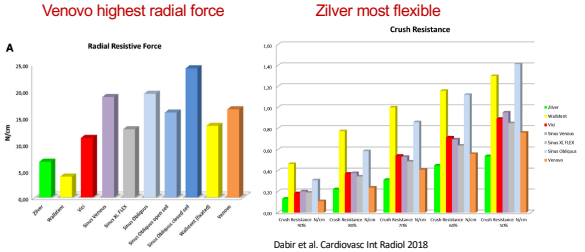
University of Pittsburgh Medical Center

Venous Stents

Venovo highest radial force

Zilver most flexible



Dabir et al. Cardiovasc Int Radiol 2018

University of Pittsburgh Medical Center

Stent Fracture. No head-to-head comparison

Abre Study (Abre). No stent fracture reported at 12 months. 44% of patients stented across the inguinal ligament.

Vernacular Study (Venovo). No stent fracture reported at 2 years. 9.2% of patients stented across the inguinal ligament.

Vivo Study (Zilver Vena). No stent fracture reported at 12 months. 32.5% of patients stented across the inguinal ligament.

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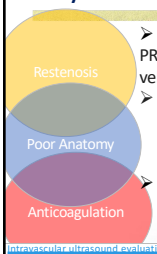
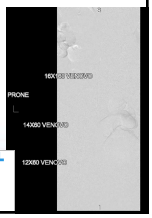
Why Stents Fail?



- Poor inflow or outflow

PROMISE trial: assessed by low peak velocities in the CFV and FV

- IVUS stent deployment significantly protects against 30-day and 2-year stent reintervention compared to venography alone.
- Extension below the inguinal ligament?



Intravascular ultrasound evaluation during iliofemoral venous stenting is associated with improved midterm patency outcomes. Avgerinos ED, et al J Vasc Surg Venous Lymphat Disord. 2022 Nov;10(6):1294-1303.

Criteria to predict mid-term outcome after **stenting** of chronic **iliac vein** obstructions (PROMISE trial). Hügel U, Khatami F, Kucher N, Baumgartner I. J Vasc Surg Venous Lymphat Disord. 2022 Aug

Anatomic Stent Failure

- Stent occlusion
- Stent fracture
- Short stack/incomplete coverage of disease segment
- Infra-inguinal extension with no inflow
- Shelving due to pelvic vein curvature
- ISR

Saleem T et al. J Vasc Surg. 2003 May; 11(3):525-531

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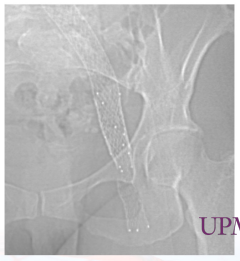
Why stents fail?



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Conclusions. Iliac Stents Fail

- **Residual thrombus (DVT), Inflow, Outflow, Landing Zones, Med Rx**

- **Future work**:

-Oblique/confluence device other to avoid contralateral jailing

-Venous stent with drug elution and/or anticoagulation for chronic obstruction

- Comparative trials to match the construct and behavior of novel venous stents to the disease/pathology treated

- **Familiarity with the construct and behavior of novel venous stents is paramount to choose the right stent for the right pathology**

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