

VENOUS ANEURYSMS

Indications and Options for Repair

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PRESENTER DISCLOSURE

Presenter: Gerrit Winkelaar

- I have no current relationships with commercial entities

CASE PRESENTATION

- 67 yo otherwise healthy female
- Checking on a house for a friend
- Locks herself inside an upper floor bathroom and the inside doorknob comes free
- Now trapped inside without her phone
- Climbs OUT of the upper floor window, hanging onto the sill, drops onto the roof of a shed and twists her left knee
- Recovers her phone
- Complains of ligamentous knee pain and swelling of her leg below the knee

CASE PRESENTATION

Venous ultrasound to rule
out DVT

“Popliteal Aneurysm”

CASE PRESENTATION

CT angiogram

Examination:
Left popliteal bruit
on auscultation

2 cm limb
circumference
difference

CASE PRESENTATION

Selective angiogram

Repair:
Prone approach

Defunctioning of AVF
Suture repair of popliteal
artery and vein at AFV
connection site

Lateral aneurysmorrhaphy
of venous aneurysm

VENOUS ANEURYSM: DEFINITION

- Solitary area of venous dilation that communicates with a main venous structure by a single channel
- Exclusive of an associated AV fistula, pseudoaneurysm or segment of varicose veins
- Extent of dilation varies in the literature
 - 1.5x adjacent
 - 2 x adjacent
 - More complex definitions in the portal venous system

PIECING TOGETHER THE LITERATURE

- Case reports
 - Case Series
 - Local experience
 - Retrospective reviews
 - Systematic reviews
-
- No high-quality evidence and considerable heterogeneity in findings

FOR INSTANCE:

Calligaro, K.D. · Ahmad, S. · Dandora, R. ...

Venous aneurysms: surgical indications and review of the literature

Surgery. 1995; **117**:1-6

- 20 year retrospective
 - 31 patients with venous aneurysms of the lower extremity
 - 71% had VTE
- 50% VTE when treated with anticoagulation alone

Presentation and management of venous aneurysms

[David L. Gillespie, MD, RVT](#) · [J.Leonel Villavicencio, MD](#) · [Chris Gallagher, MD](#) · ... · [Mark R. Jackson, MD](#) · [Emmanouil Pikoulis, MD](#)

Volume 26, Issue 5, P845-852, November 1997

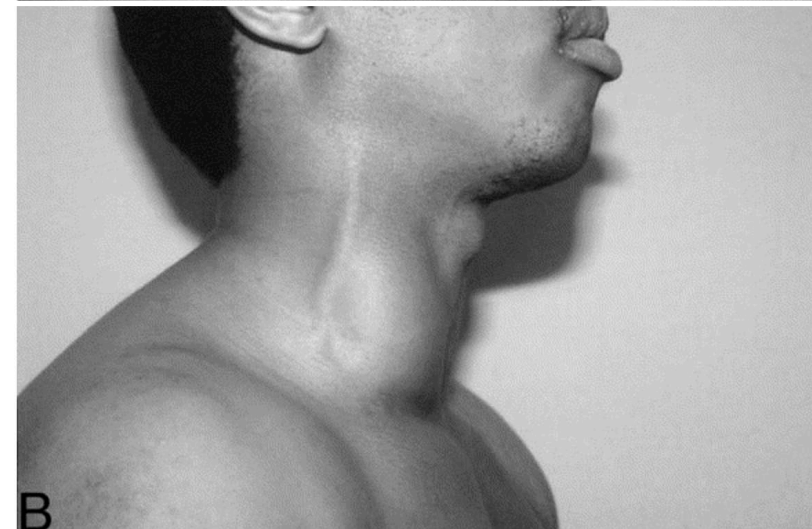
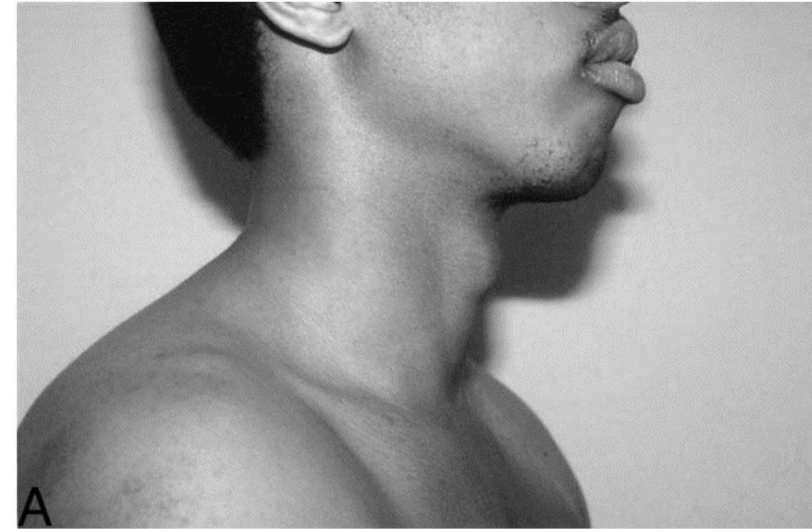
- 22 year retrospective
- 35 patients with venous aneurysms of the lower extremity
- 15% had VTE

PRESENTATION OF VENOUS ANEURYSMS

- Dependent on location
 - Neck: Cosmetic concerns
 - Upper extremity
 - Pain or mass
 - VTE is rarely reported
 - Abdomen:
 - Pain
 - GI hemorrhage due to fistula formation
 - VTE
 - Duodenal or biliary compression
 - Portal venous hypertension
 - Lower extremity:
 - Mass most common
 - Pain
 - Swelling
 - Thromboembolism

JUGULAR VENOUS ANEURYSMS

- Cosmetic
 - Large bulge with Valsalva
- No reported VTE or other complications



Presentation and management of venous aneurysms

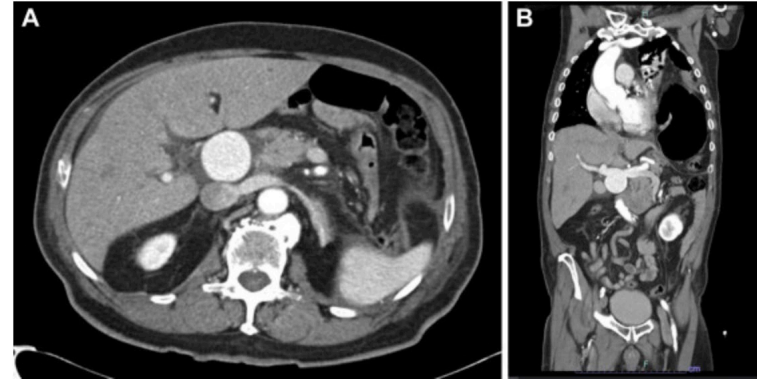
UPPER EXTREMITY

- Described less frequently than jugular aneurysms
- Usually incidentally identified
- Rare VTE source

ABDOMINAL VENOUS ANEURYSMS

- Sites

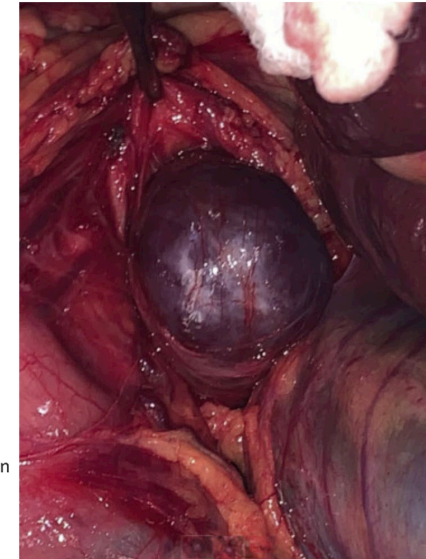
- IVC
- Portal/SMV
- Splenic
- Iliac veins



- Portal venous aneurysms are the most common of the visceral venous aneurysms but account for < 3% of all venous aneurysms

- Associated with a history of

- Pancreatitis
- Trauma
- Cirrhosis
- Portal hypertension



Operative management of an incidental portal vein aneurysm in the setting of an incarcerated congenital diaphragmatic hernia

[Tej A. Sura, BS](#) · [Mina L. Boutros, MD](#) · [Miriam I. Ruiz, MD](#) · [Michael S. Williams, MD](#) 

ABDOMINAL VENOUS ANEURYSMS

- Portal venous aneurysms
 - Duodenal compression
 - Common bile duct obstruction
 - Chronic portal hypertension from stagnant flow and/or thrombosis
 - Surgical treatment recommended for complications or growth
 - Unclear what rate of growth is acceptable and at what size to intervene
- Calligaro et al:
 - Patients with abdominal venous aneurysms
 - 41% had life threatening complications
 - Recommended prophylactic surgical intervention in low-risk patients
 - No size threshold

LOWER EXTREMITY VENOUS ANEURYSMS

Contemporary management and outcomes of peripheral venous aneurysms: A multi-institutional study

Rhusheet Patel ¹, Karen Woo ², Thomas W Wakefield ³, Robert J Beaulieu ⁴, Manar Khashram ⁵, Giovanni De Caridi ⁶, Filippo Benedetto ⁶, Sherene Shalhub ⁷, Asmaa El-Ghazali ⁷, Jeffrey E Silpe ⁸, Mihai Rosca ⁸, Tina U Cohnert ⁹, Gregor K Siegl ⁹, Christopher Abularrage ¹⁰, Rebecca Sorber ¹⁰, Catherine M Wittgen ¹¹, Paul G Bove ¹², Graham W Long ¹², Kristofer M Charlton-Ouw ¹³, Hunter M Ray ¹³, Peter Lawrence ², Donald Baril ¹⁴

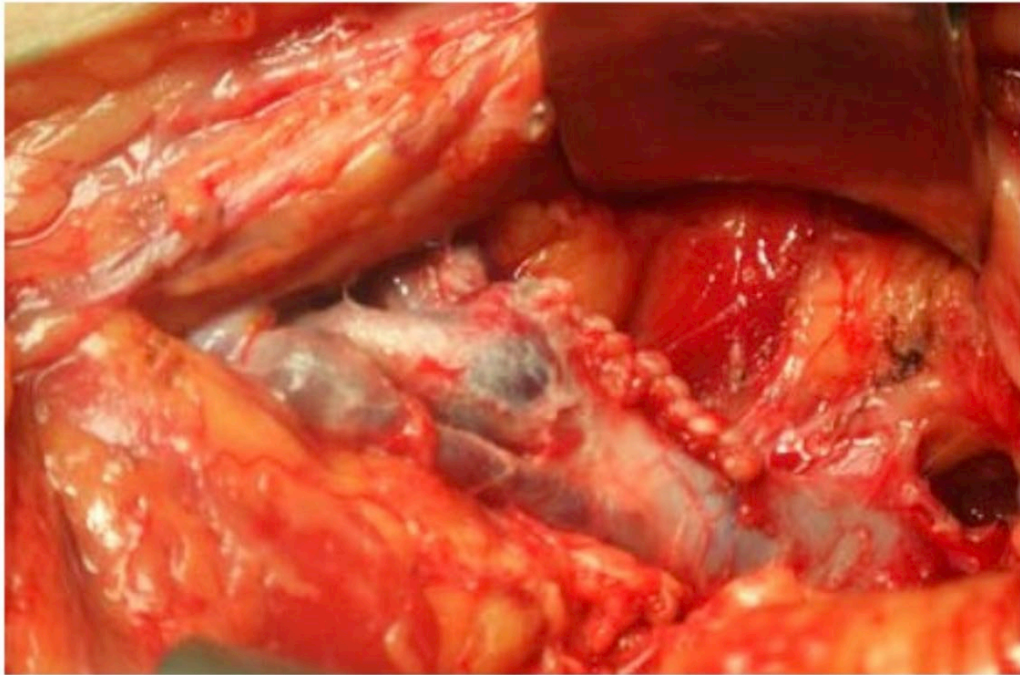
J Vasc Surg Venous Lymphat Disord. 2022 Nov;10(6):1352-1358.

- 66% popliteal aneurysms
- 17% ilio-femoral

- Findings:
 - 20% of popliteal venous aneurysms present with DVT or PE
 - 33% present with pain
 - 47% incidental
- DVT/PE risk associated with:
 - Larger diameter > 2.5 cm
 - Saccular configuration
 - Fusiform morphology with > 25% diameter thrombus burden
- 40% failure rate in preventing VTE with anticoagulation alone

OPTIONS FOR REPAIR

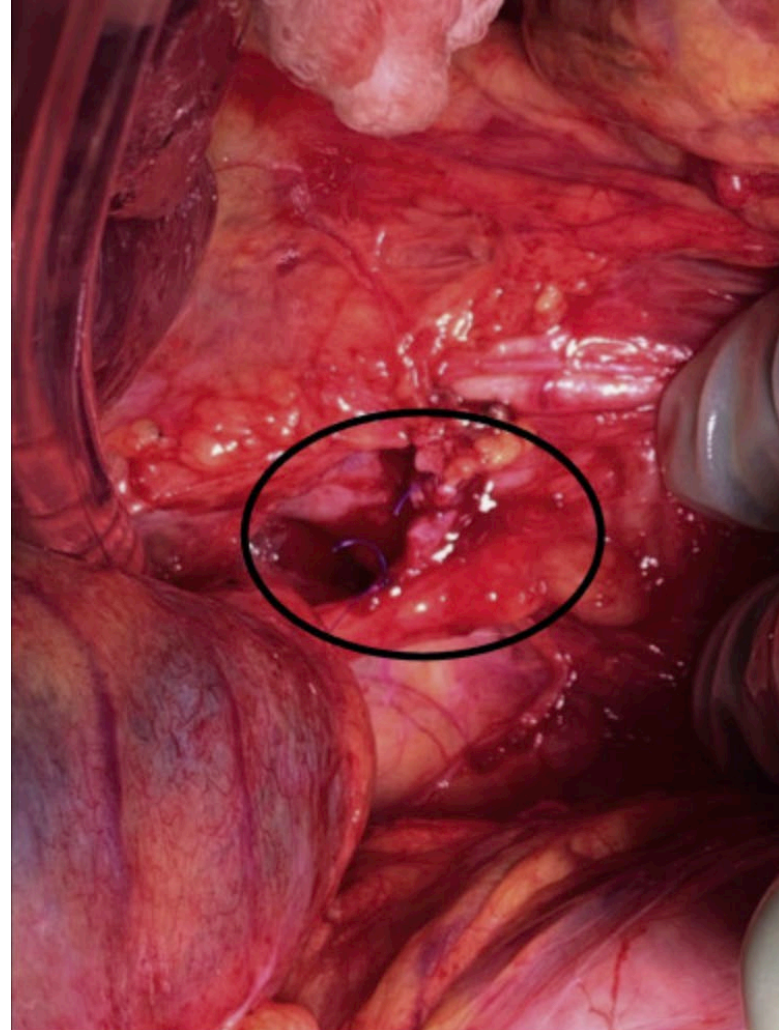
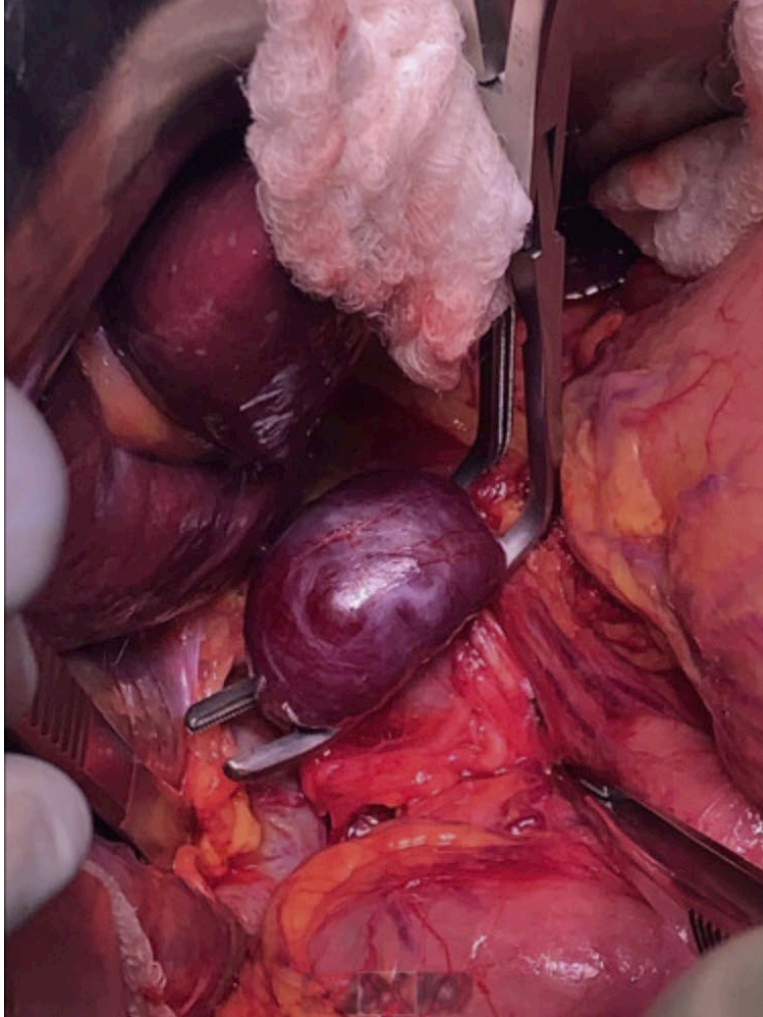
- Lateral aneurysmorrhaphy
 - Most commonly described



- Satinsky clamp at the level of the normal wall of the proximal and distal vein – marks the wall
- Satinsky clamp then placed deeper onto the vein and Blalock two-layer repair performed using the original clamp mark as a guide

OPTIONS FOR REPAIR

- Lateral aneurysmorrhaphy: Portal vein



OPTIONS FOR REPAIR

- Open Plication
 - Described for patients with luminal thrombus
 - Proximal and distal control with heparin on board
 - Longitudinal venotomy
 - Thrombectomy with redundant wall resection and primary closure
- Concerns:
 - Adequate removal of organized thrombus
 - Thin vein wall and integrity of repair
- Interposition grafting
 - Option for large thrombus burden
 - No publications recommend a specific conduit
 - Small or long saphenous vein depending on the size requirements
 - 3 months of anticoagulation mentioned in some reports
 - No use of adjunctive AV fistula creation reported

OPTIONS FOR REPAIR

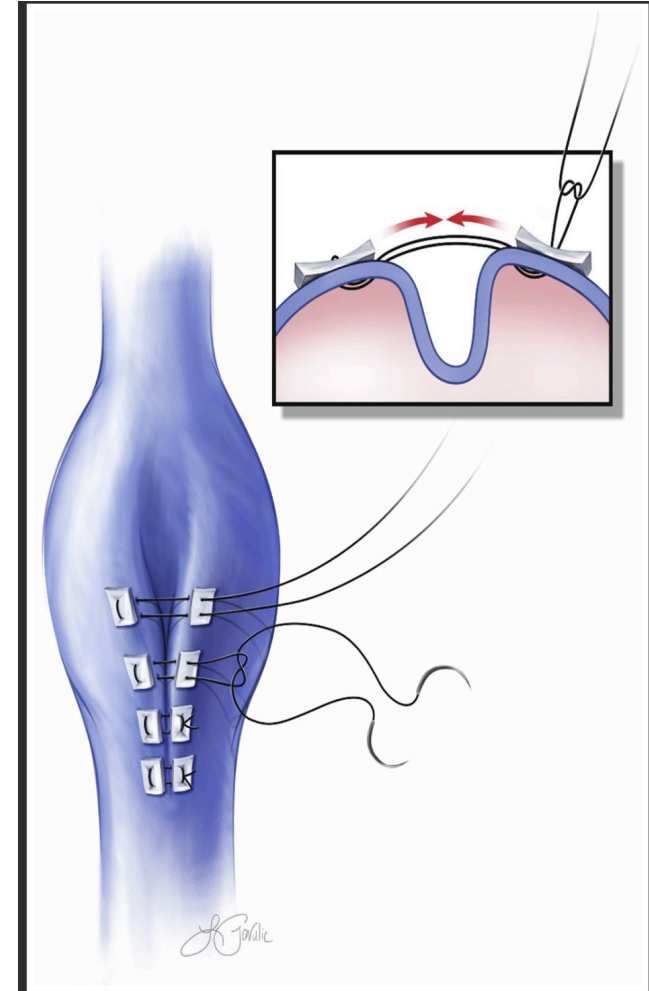
- Closed Plication

Closed plication is a safe and effective method for treating popliteal vein aneurysm

Robert J Beaulieu ¹, Anna M Boniakowski ¹, Dawn M Coleman ¹, Chandu Vemuri ¹,
Andrea T Obi ¹, Thomas W Wakefield ²

J Vasc Surg Venous Lymphat Disord. 2021 Jan;9(1):187-192.

- 10 cases reported – no complications
- No anticoagulation post op



OPTIONS FOR REPAIR

- Excision and ligation
 - Internal Jugular
 - Peripheral upper extremity
 - Popliteal with large thrombus burden and no conduit for reconstruction
- Most common treatment reported by Gillespie et al in 1997 - 77%
- Endovascular
 - Less than 10 case reports in the literature
 - Visceral (splenic) stenting via trans hepatic portal approach
 - Iliac venous aneurysm associated with AVF – AVF embolized and aneurysm size reduced

SUMMARY

- Majority of venous aneurysms are found in the lower extremity
 - Significant rate of VTE with anticoagulation alone
 - Indications for repair:
 - Popliteal aneurysm over 2.5 cm
 - > 25% luminal clot burden
 - Saccular configuration
 - All iliofemoral venous aneurysms
- Upper extremity and jugular aneurysms have negligible risk of VTE and can be monitored
 - No guidelines on frequency or threshold for intervention
- Intra-abdominal aneurysms have a high rate of life-threatening events and should be repaired in low-risk patients
- Lateral aneurysmorrhaphy seems to be the most commonly utilized repair method

