


Popliteal Venous Aneurysm When & How to Treat



**NORTHWESTERN
UNIVERSITY**

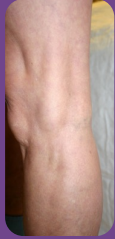
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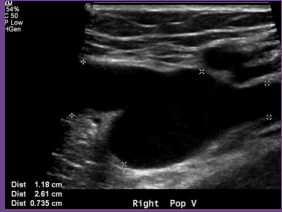
Disclosures

- Speaking fees WL Gore

Popliteal Venous Aneurysms

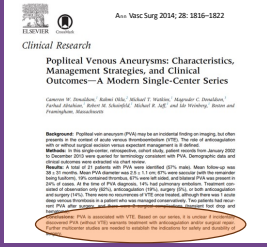
- Still, very rare
 - 0.1-2%
 - Less than 300 cases
 - Largest multicentric series
 - Patel et al 40
 - Noopeny et al 39






Diat 1.18 cm
Diat 2.61 cm
Diat 0.735 cm
Right Pop V

When to Treat?





When to Treat?

Observation or AC for small PA's or in elderly patients

Surgery if High Risk for Embolism

- Symptomatic
- Size > 2 or 2.5 cms
- Turbulent flow
- Saccular
- Thrombus (>25%)

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

Abstract: Popliteal venous aneurysms result in the risk of pulmonary embolism (PE) and chronic venous insufficiency (CVI) among patients in the setting of deep vein thromboses. An observational, retrospective, multi-institutional study was conducted to evaluate the contemporary management and outcomes of popliteal venous aneurysms.

Methods: We performed a retrospective, multi-institutional review of all patients with asymptomatic venous aneurysms treated from 2010 to 2018. A venous aneurysm was defined as a saccular or fusiform vein aneurysm (VIA) > 1.5 cm.

Results: A total of 48 popliteal venous aneurysms from 13 institutions were analyzed, with a mean size of 2.6 cm (range 1.2-5.0 cm) and a mean diameter of 1.8 cm (range 0.7-3.5 cm). The mean follow-up time was 18 months (range 3-60 months). The most common presentation was asymptomatic (50%), followed by embolism (33%), and pain (17%). The most common management strategy was observation (33%), followed by end-to-end anastomosis (29%), and bypass (29%). The most common complication was thrombosis (17%).


Conclusion: Popliteal venous aneurysms are a rare but potentially serious condition. Contemporary management strategies include observation, end-to-end anastomosis, and bypass. The choice of management strategy should be individualized based on patient characteristics and aneurysm features.

Keywords: Popliteal venous aneurysm, end-to-end anastomosis, bypass, thrombosis, pulmonary embolism.

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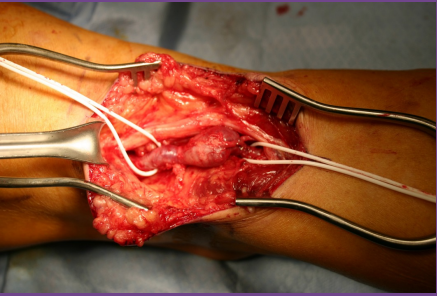
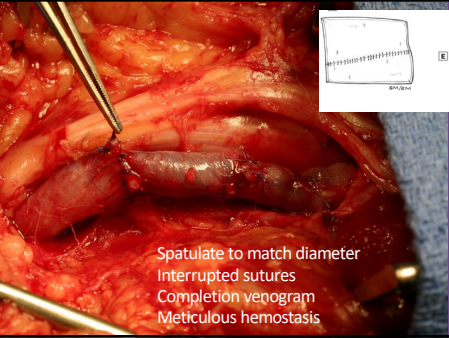
How to Treat?

- Surgical options:
 - Aneurysmectomy with lateral venorrhaphy
 - Plication (open or closed)
 - Resection with end-to-end anastomosis
 - Bypass using for conduit
 - Internal Jugular Vein
 - Saphenous panel or spiral



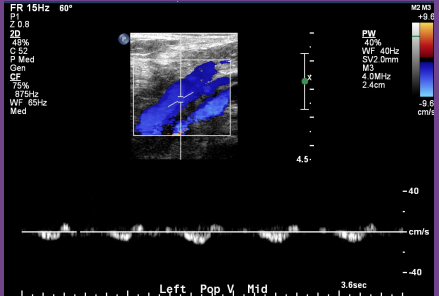
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Spatulate to match diameter
Interrupted sutures
Completion venogram
Meticulous hemostasis

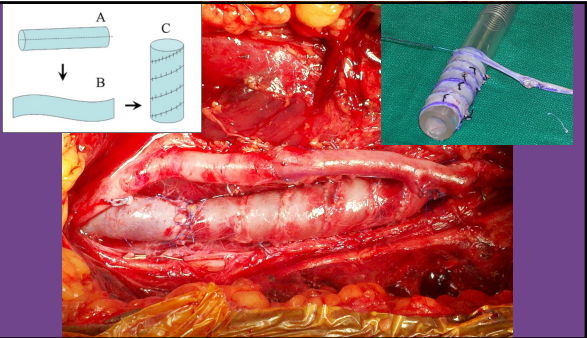
AC for 3 months



FR 15Hz 60°
PI 2.0.8
2D
48Hz
C 5.2
P Med
Gain
GE
75%
WF 88Hz
Med

PW 48Hz
WF 40Hz
SV 2.0mm
MS
4.0MHz
2.4cm

4.5
-40
-40
cm/s
3.6sec
Left Pop V Mid



A, B, C diagrams showing different vessel repair methods: A (spatulated end-to-end), B (interposed patch), and C (interposed conduit).

Clinical Research

Popliteal Venous Aneurysms: Characteristics, Management Strategies, and Clinical Outcomes—A Modern Single-Center Series

Not all PVA need to be treated
Single center, retrospective
Patients with PE select themselves out
2 yr follow up?

13	Observation
4	AC
1	Surgery
3	Surgery + AC

Mean f/u 38 months

NO recurrent VTE after Rx
 1 DVT (observation)
 2 Recurrent aneurysm
 2 Complications

Ann Vasc Surg 2014; 28: 1816–1822

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Editor's Choice

Treatment of popliteal vein aneurysms

Thomas Szupiany, MD; Donald Kopp, MD; Karen Pflaum, MD; Wilma Schilling, MD; Benjamin Muehlenberg, MD; and Barbara Grottel, MD; Hansjörg and Ferdinand Grottel, and Zoltan Bekerecs

ONE Activity

ABSTRACT

OBJECTIVE: Popliteal vein aneurysms are associated with high risk for deep venous thromboses (DVT) and pulmonary embolism. The goal of this study was to report treatment strategies for distal vein aneurysms in that subunit after long-term follow-up.

DESIGN: A prospective, descriptive study from 2008 to 2014 with retrospective evaluation and analysis of medical records in a tertiary care center. This was a retrospective study of patients with popliteal vein aneurysms who were treated with observation, AC, or surgery. The study was conducted in a tertiary care center with a dedicated vascular laboratory.

SETTING: A tertiary care center with a dedicated vascular laboratory.

PARTICIPANTS: A total of 21 patients with popliteal vein aneurysms were included in the study. The study included 13 patients who were treated with observation, 4 patients who were treated with AC, and 1 patient who was treated with surgery. The study also included 3 patients who were treated with surgery and AC.

MEASUREMENTS AND MAIN RESULTS: The mean follow-up time was 38 months. There were no recurrent VTE after treatment. There was 1 DVT (observation), 2 recurrent aneurysms, and 2 complications.

CONCLUSIONS: Not all PVA need to be treated. Single center, retrospective. Patients with PE select themselves out. 2 yr follow up? VTE complications may be lower than we thought. Complications related to resection have been under reported.

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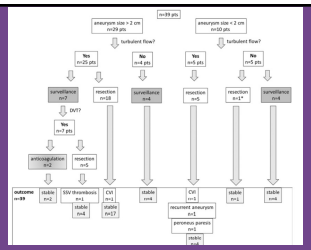
Thomas Ruppel MD, Gabriel Hipp MD, Kaye Hays MD, Wilma Schilling MD, Joseph Hernandez MD, and Stefan Czornyj MD, University of Heidelberg Germany and Zurich Switzerland

CONCLUSION

OBJECTIVE: Popliteal vein aneurysms are associated with high risk for acute venous thrombosis (VTE) and pulmonary embolism (PE). The purpose of this study was to evaluate the management of popliteal vein aneurysms (PVA) with the widespread use of venous duplex scanning (VDS). PVA are increasingly found in patients with deep vein thrombosis (DVT) and are associated with a high risk for acute VTE and PE. The purpose of this study was to evaluate the management of PVA with the widespread use of VDS. PVA are increasingly found in patients with DVT and are associated with a high risk for acute VTE and PE. The purpose of this study was to evaluate the management of PVA with the widespread use of VDS.

ABSTRACT

Popliteal vein aneurysms (PVA) are increasingly found in patients with deep vein thrombosis (DVT) and are associated with a high risk for acute venous thrombosis (VTE) and pulmonary embolism (PE). The purpose of this study was to evaluate the management of PVA with the widespread use of venous duplex scanning (VDS). PVA are increasingly found in patients with DVT and are associated with a high risk for acute VTE and PE. The purpose of this study was to evaluate the management of PVA with the widespread use of VDS.



Guidelines 5.6.0 of the American Venous Forum on the management of venous malformations and aneurysms

No.	Guideline	Grade of recommendation (strong/weak)	Grade of evidence (A, high quality; B, moderate quality; C, low or very low quality)
5.6.1	We recommend surgical repair of non asymptomatic lower extremity venous aneurysms because of the risk of thromboembolic complications.	1	B

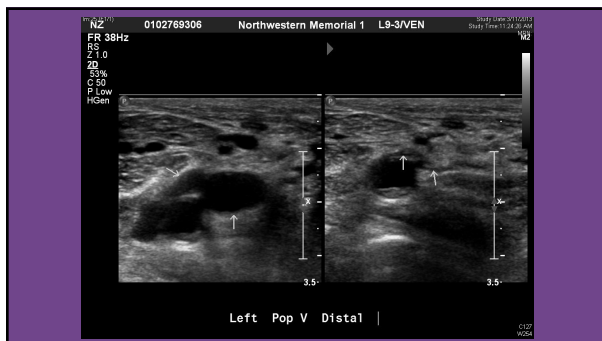
Really?

Management of symptomatic and asymptomatic popliteal venous aneurysms: A retrospective analysis of 25 patients and review of the literature

Carsten Böhm, MD, Philipp Schindler, MD, Michael Pertsch, MD, Jochen Frank, MD, Jan-Luca Magina, MD, and Hans-Günther Schmidt, MD, *Consilium and Lern, Mainz*

Objective: Popliteal venous aneurysms (PVA) are an uncommon but potentially life-threatening disease because they can be a source for pulmonary emboli (PE). With the widespread use of venous duplex scanning, PVA are increasingly found in patients with deep vein thrombosis (DVT) and are associated with a high risk for acute VTE and PE. The purpose of this study was to review our experience in the management of PVA diagnosed by patients with DVT and to present our treatment strategy. We retrospectively analyzed 25 patients with PVA who were treated by our venous clinic between 1998 and 2009. There were 20 women and five men, with an average age ranging from 58 to 79 years (mean age, 69 years). Twenty-four percent (6/25) presented with PE and 76% (19/25) of PVA were diagnosed during investigation for chronic venous disease (varicose veins, n = 13; post-thrombotic syndrome, n = 10). The diagnosis of PVA was achieved in all cases with venous duplex scanning and phlebography. Aneurysms were located in the proximal popliteal vein (n = 17) and in the distal popliteal vein (n = 8). During the period 1/1/2001 to 31/12/2009, we treated 40 (11/2001) had an isolated aneurysm. The patients with PE underwent cardiac arrest, with one requiring a pulmonary embolism. The follow-up was considered a statistically significant correlation between PE and the presence of thrombus (OR = 7) without thrombus, P = .025. Aneurysms were treated with surgical resection and ligation (n = 19), resection with end-to-end anastomosis (n = 2), resection with interruption of the parent vein (n = 2), or the superficial femoral vein (n = 1), and resection with vein reconstruction (n = 1). The patients were reoperated 3.1 and 4.6 times after vein ligation and resection, respectively. No operative deaths occurred, and no patient had evidence of a recurrent PE. Postoperative minor complications (DVT) included venous stasis (n = 2), postoperative thrombosis of the surgical popliteal vein (n = 2), and wound infection (n = 1). Postoperative thrombosis of the surgical popliteal vein occurred in three patients, and patients were treated with anticoagulation therapy. Thrombotic thrombocytopenic syndrome (TTP) was observed in one patient. The study included 25 patients with PE and 10 patients presenting with thrombotic venous disease. Because of the significant risk of thromboembolic complications, surgical treatment that is associated with a low morbidity rate is indicated in all PVAs. Tangential aneurysmectomy with ligation and resection is the procedure of choice. (J Vasc Med Biol 2010;22:192-193)

Leg edema 3-4 wks after, US occluded bypass



Popliteal Venous Aneurysms

- All should be repaired due to risk for embolism
- Aneurysmorrhaphy vs repair
- Conduits include IJV, panel, spiral GSV
- Avoid purse-string effect
- Completion venography very useful
- Short course of anticoagulation

Conclusions

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No.	Guideline	Grade of recommendation (strong/weak)	Grade of evidence (A, high quality; B, moderate quality; C, low or very low quality)
5.6.1	We recommend surgical repair of vein asymptomatic lower extremity venous aneurysms because of the risk of thromboembolic complications	1	B
5.6.2	For aneurysms of superficial veins of the arm or leg or of deep veins of the arm we recommend observation unless cosmetic reasons or complications warrant repair	2	B
5.6.3	For jugular vein aneurysms we recommend observation unless cosmetic reasons or psychological reasons warrant surgical repair	2	C
5.6.4	For abdominal venous aneurysms we recommend repair because of the risk of rupture and thromboembolism	2	B
5.6.5	Thoracic venous aneurysms are infrequently associated with rupture or thromboembolic complications and can be observed in most cases	2	B

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From the Society for Clinical Vascular Surgery

Contemporary management of lower extremity venous aneurysms

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Los Angeles, Calif

ABSTRACT
OBJECTIVE: Lower extremity venous aneurysms may lead to venous morbidity in patients, including pulmonary embolism (PE) and chronic venous insufficiency. However, because of the low incidence of these aneurysms, no criteria for their treatment exist. The objective of this study was to review the presentation and management of lower extremity venous aneurysms at our institution.
Methods: A retrospective review of all patients with isolated lower extremity venous aneurysms treated at a single tertiary care medical center from 2003 to 2017 was conducted.
Results: Five male and six female patients with lower extremity venous aneurysms were identified, with a mean age of 55.5 years. These patients presented with deep venous thrombosis (DVT) three presented with pain, and five venous aneurysms were found incidentally. None of 8 patients had aneurysms involving the popliteal vein, one was in the femoral vein, and one was in the common femoral vein. Diagnosis was made by duplex ultrasound in five patients, magnetic resonance imaging in five patients, and computed tomography angiography in one patient. Mean aneurysm to adjacent vein ratio was 2.0. In patients who had venous aneurysms diagnosed incidentally without thromboembolic clinical features, three patients who were initially treated conservatively with oral anticoagulation demonstrated no further aneurysm enlargement. The indication for operation was deep venous thrombosis or PE in three patients and lower extremity swelling in three patients of whom two presented with oral anticoagulation. Three patients had minor resection, two patients had aneurysmectomy and ligation of the vein, and one patient underwent aneurysmectomy with ligation of an incompetent vein in situ. Mean follow-up was 48 months, with no recurrent thromboembolism. Postoperative complications included postoperative hematomas (one) and superficial thrombophlebitis (one).
Conclusions: Lower extremity venous aneurysms continue to represent a rare but potentially morbid vascular disease. Symptomatic patients demonstrated a clear benefit from surgery in combination with conservative management. Larger multicenter studies are required to properly characterize the natural history and management of this disease. (J Vasc Surg Venous and Lym Dis 2018;7:617-621.)
Keywords: venous aneurysm; Deep venous thrombosis (DVT); Thromboembolism; Lower extremity; Low frequency

A systematic review of venous aneurysms by anatomic location

Katherine A. Tapan MD, Thomas M. Makris MD, and Mark A. Ashman MD, New York, NY

ABSTRACT
Objective: Venous aneurysms are uncommon vascular anomalies that may be identified anywhere in the body. However, they vary after categorization by their location, but with the advent of imaging modalities, systematic review of these lesions has not been conducted. Our objective was to review the presentation of venous aneurysms, evaluate imaging modalities for defining them, and management.
Methods: The English language literature was searched for the topic of location of the venous aneurysm and management by using MeSH terms: venous aneurysm, CT scan, ultrasound, and vein repair of primary venous aneurysm. The following terms related to the location of the venous aneurysm and management by using MeSH terms: deep vein, superficial vein, and common femoral vein.
Results: A total of 100 articles were included. Eighty-two were published in the field of the location of the venous aneurysm and management by using MeSH terms: venous aneurysm, CT scan, ultrasound, and vein repair of primary venous aneurysm. The remaining 18 articles were published in the field of the location of the venous aneurysm and management by using MeSH terms: deep vein, superficial vein, and common femoral vein. The most common location of the venous aneurysm was the lower extremity (45%), followed by the upper extremity (25%), and the thorax (15%). The most common imaging modality used to define the venous aneurysm was duplex ultrasound (45%), followed by computed tomography angiography (25%), magnetic resonance imaging (15%), and ultrasonography (15%). Management was to support these lesions and/or to treat aneurysms in isolated lower extremity aneurysms of the extremities or to treat with surgical intervention in the presence of venous thromboembolism. We report the anatomic management of these lesions in our institution. Presentation review by anatomic location.
Conclusions: Venous aneurysms are uncommon vascular anomalies that may be identified anywhere in the body. However, they vary after categorization by their location, but with the advent of imaging modalities, systematic review of these lesions has not been conducted. Our objective was to review the presentation of venous aneurysms, evaluate imaging modalities for defining them, and management.
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Ann Vasc Surg 2014; 28: 1816-1822

Clinical Research

Popliteal Venous Aneurysms: Characteristics, Management Strategies, and Clinical Outcomes—A Modern Single-Center Series

Gannon W. Donaldson¹, Robert Oliba¹, Michael T. Washburn¹, Margarita C. Donaldson¹, Farhad Akhavan¹, Robert M. Schuchfeld¹, Michael R. Jull¹, and Jodi Winberg¹ Boston and Framingham, Massachusetts

Background: Popliteal vein aneurysm (PVA) may be an incidental finding on imaging, but often presents in the context of acute venous thromboembolism (VTE). The role of anticoagulation with or without surgical excision versus expectant management is ill defined.
Methods: In the single-center, retrospective, cohort study, patient records from January 2002 to December 2013 were queried for terminology consistent with PVA. Demographic data and clinical outcomes were extracted via chart review.
Results: A total of 21 patients with PVA were identified (57% male). Mean follow-up was 38 ± 23 months. Mean PVA diameter was 2.5 ± 1.1 cm. CT was most common (57%) imaging modality. PE was confirmed in 10% of cases, DVT was confirmed in 24% of cases. At the time of PVA diagnosis, 14% had pulmonary embolism. Treatment consisted of anticoagulation only (57%), anticoagulation (21%), surgery (15%), or both anticoagulation and surgery (7%). There were no recurrences of VTE once treated, although there was 1 acute deep venous thrombosis in a patient who was managed conservatively. Two patients had recurrent PVA after surgery, and there were 2 surgical complications (transient foot drop and hematomas).
Conclusions: PVA is associated with VTE. Based on our series, it is unclear if incidentally discovered PVA without VTE warrants treatment with anticoagulation and/or surgical resection. Further multicenter studies are needed to establish the indications for safety and suitability of surgery.

21 patients in 11 years
Mean Diameter 2.5 cms

13 Observation
4 AC
1 Surgery
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