

# EVIDENCE BASED STATEMENT

DOMAIN **04**, Statement **08**

TOPIC: “Artero-venous malformations diagnostic and treatment protocol”

## SEARCH TERMS & SOURCES

Query used for the literature search / Search engines used (PubMed, Embase, Cinhal and the Cochrane)  
(( "Arteriovenous Malformations/diagnostic imaging"[Mesh] OR "Arteriovenous Malformations/drug therapy"[Mesh] OR "Arteriovenous Malformations/radiotherapy"[Mesh] OR "Arteriovenous Malformations/surgery"[Mesh] OR "Arteriovenous Malformations/therapy"[Mesh] )) AND "Lower Extremity"[Mesh]

## INCLUSION CRITERIA

- Lower limb only
- Reviews
- Publication < 10 years, only ENG

## SEARCH RESULT BEFORE - AFTER SELECTION

5 (before) - 5 (after selection)

## PERTINENT LITERATURE NOT IDENTIFIED BY THE LITERATURE SEARCH

1. Soulez G, Gilbert Md Frcpc P, et al. Interventional Management of Arteriovenous Malformations. Tech Vasc Interv Radiol. 2019 Dec;22(4):100633.
2. Lee BB. ISVI-IUA consensus document diagnostic guidelines of vascular anomalies: vascular malformations and hemangiomas. Int Angiol. 2015 Aug;34(4):333-74.

# EVIDENCE BASED STATEMENT

## Domain 4; Statement 8

### IDENTIFIED REFERENCES

1. Ornelas-Flores MC, Rojas-Reyna GA, Hinojosa-Gutiérrez CG, Leo SG. Endovascular management of a complex high-flow lower limb arteriovenous malformation: Case report and literature review. *Cir Cir.* 2021;89(S1):14-9.
2. Maharaj MM, Biju R, Khashram M, Hussain Z. Delayed Fragmentation and Distal Embolization of Retained Microcatheter Causing Lower Limb Ischemia: Case Report and Review of the Literature. *World Neurosurg.* 2020;140:369-73.
3. Gao X, Guo J, Tong Z, Guo L, Zhang J, Gu Y. Successful Treatment of Acquired Arteriovenous Fistulas after Iliac Vein Thrombosis. *Ann Vasc Surg.* 2020;62:499.e15-.e20.
4. Parin L, Madhu G, Anil T, Sonali B. Anesthetic Management of a Patient with Cowden Syndrome and Review of Anesthetic Concerns. *J Clin Anesth.* 2017;38:173-4.
5. Slama R, Long B, Koyfman A. The emergency medicine approach to abdominal vascular graft complications. *Am J Emerg Med.* 2016;34(10):2014-7.

# EVIDENCE BASED STATEMENT

## Domain 4; Statement 8

### TEXT FOR INCLUSION IN THE DOCUMENT

DOMAIN 04, Statement 08, TOPIC: “Artero-venous malformations diagnostic and treatment protocol”

Artero-venous malformations (AVM) represent a rare condition, and they are the least common type of congenital vascular malformations. They can be classified in low-flow, high-flow, and mixed AVMs. High-flow AVMs represent 10% of lower-limb AVMs. The most common place to find them is the cranium, followed by the extremities and finally in the trunk.

**[Sicard GA. Rutherford's Vascular Surgery and Endovascular Therapy. New York:Elsevier;2018]**

All AVMs are potentially limb threatening and even life-threatening. An early aggressive approach to all AVMs is warranted to reduce, if not prevent, the immediate risk of bleeding as well as the long-term risks of cardiac failure and gangrene. Clinically, it is difficult to select the optimal treatment to enhance long-term success in managing AVMs. Surgical excision offers the best opportunity for “cure.” However, diffuse excision of infiltrating AVMs of the extratruncular form can be associated with significant morbidity as well as with failure of attempted cure.

**\*[Lee B-B, Do YS, Yakes W, Kim DI, Mattassi R, Hyon WS. Management of arteriovenous malformations: a multidisciplinary approach. J Vasc Surg. 2004;39(3):590-600.]**

It is often accompanied by excessive blood loss in addition to serious complications. Thus, incomplete removal of the AVM is a frequent result of attempts to avoid the high morbidity associated with total excision.

**[Lee B-B, Bergan JJ. Advanced management of congenital vascular malformations: a multidisciplinary approach. Cardiovasc Surg. 2002;10(6):523-33.]**

Minimally invasive embolization techniques are alternative therapeutic options. The goal of any AVM embolization is to eliminate the AVM nidus. A combination of approaches to deliver embolic agents using transarterial, direct puncture, or retrograde transvenous embolization may be required.

**[Soulez G, Gilbert Md Frcpc P, et al. Interventional Management of Arteriovenous Malformations. Tech Vasc Interv Radiol. 2019 Dec;22(4):100633].**

The most commonly used embolic agents have been ethanol and n-butyl cyanoacrylate. Additionally, various types of coils, and/or contour particles such as ivalon were used in various combinations, simultaneously or in stages, depending upon the location, severity, and extent of the AVM. Another commonly used agent in AVM treatment is the slowly polymerizing agent Onyx.

**[Yakes W. Percutaneous embolization of arteriovenous malformations at the plantar aspect of the foot. J Vasc Surg 2016;64:1478-82.]**

# EVIDENCE BASED STATEMENT

## Domain 4; Statement 8

### STATEMENT FOR PUBLIC EVIDENCE-BASED AWARENESS

DOMAIN 04, Statement 08

**“An arterial component inside a venous malformation should always be excluded before designing the treatment strategy”**

### SELECTED REFERENCES

1. Sicard GA. Rutherford's Vascular Surgery and Endovascular Therapy. New York:Elsevier;2018
2. \*Lee B-B, Do YS, Yakes W, Kim DI, Mattassi R, Hyon WS. Management of arteriovenous malformations: a multidisciplinary approach. J Vasc Surg. 2004;39(3):590-600.
3. Lee B-B, Bergan JJ. Advanced management of congenital vascular malformations: a multidisciplinary approach. Cardiovasc Surg. 2002;10(6).
4. \*Soulez G, Gilbert Md Frcpc P, et al. Interventional Management of Arteriovenous Malformations. Tech Vasc Interv Radiol. 2019 Dec;22(4):100633
5. Yakes W. Percutaneous embolization of arteriovenous malformations at the plantar aspect of the foot. J Vasc Surg 2016;64:1478-82.

### identified LITERATURE BIAS

Heterogenous hemodynamic impact of the artero-venous malformations assessed in the different studies.

### SUGGESTED NEXT LINES OF RESEARCH

Artero-venous malformations best imaging options identification