

# **Vascular anomalies of the extremities: an update**

A protocol submitted for fulfillment of  
master's degree in general surgery

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## ***List of Abbreviations***

<b>AP</b>	Antero-posterior
<b>AT</b>	Anterior tibial
<b>AVFs</b>	Arterio-venous fistulas
<b>AVM</b>	Arterio-venous malformation
<b>bFGF</b>	Basic fibroblast growth factor
<b>CAVMs</b>	Capillary arterio-venous malformation
<b>CD</b>	Cluster of differentiation
<b>CFA</b>	Common femoral artery
<b>CH</b>	Congenital hemangioma
<b>CIA</b>	Common iliac artery
<b>CLVM</b>	Capillary-lymphatic-venous malformation
<b>CMs</b>	Capillary malformations
<b>CT</b>	Computed tomography
<b>CTA</b>	Computed tomography angiography
<b>CVM</b>	Congenital vascular malformation
<b>DSA</b>	Digital subtraction angiography
<b>EIA</b>	External iliac artery
<b>GLUT1</b>	Glucose transporter 1
<b>IFN</b>	Interferon
<b>IH</b>	Infantile hemangioma
<b>IIA</b>	Internal iliac artery
<b>KHE</b>	Kaposiform hemangioendothelioma
<b>LIC</b>	localized intravascular coagulopathy
<b>LMs</b>	Lymphatic malformations
<b>LSV</b>	Long saphenous vein
<b>LVMs</b>	Lymphatic venous malformations
<b>MRA</b>	Magnetic resonance angiography
<b>MRI</b>	Magnetic resonance image
<b>NBCA</b>	N-butyl cyanoacrylate
<b>Nd:YAG</b>	Neodymium-.yttrium aluminum garnet
<b>PA</b>	Popliteal artery
<b>PeA</b>	peroneal artery
<b>PFA</b>	Profunda femoral artery
<b>PG</b>	Pyogenic granuloma

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<b>PT</b>	Posterior tibial
<b>PTA</b>	Posterior tibial artery
<b>SA</b>	Subclavian artery
<b>SFA</b>	Superficial femoral artery
<b>SSV</b>	Short saphenous vein
<b>TLPS</b>	Transarterial lung perfusion scintigraphy
<b>VEGF</b>	Vascular endothelial growth factor
<b>VMs</b>	Vascular malformations
<b>VMs</b>	Venous malformations
<b>WBBPS</b>	whole-body blood pool scintigraphy

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## **Aim of the work**

This study is designed to understand the nature, the course, the pathology, how to diagnose, and how to treat the vascular malformations of the extremities.

## **Introduction**

There have been few areas in medicine in which so much confusion and controversy have existed than in the field of vascular malformation (***Rohrich & Spicer, 1986***).

Vascular malformations occur as a result of an arrest in the development of the vascular system (***Gloviczki et al., 2009***).

Vascular malformations are congenital errors in vascular morphogenesis. They are categorized by the nature of their predominant vascular channels. Some are clinically apparent at birth, but other types appear later, usually by the fourth decade. Because of the late appearance, they are often called “acquired lesions,” but in fact, they most likely develop from a dormant analog, present since birth (***Fishman & Mulliken, 1998***).

Vascular malformations and hemangiomas can cause significant morbidity and even mortality in both

children and adults. For a number of reasons, physicians often confuse these lesions. The nomenclature for classifying these lesions is often used interchangeably and inappropriately (**Donnelly et al., 2000**).

Vascular anomalies are among the most common congenital abnormalities in infants and children. Historically, the treatment of these lesions has been impeded by confusing terminology and lack of a precise classification system. Lesions were named with descriptive terms such as strawberry hemangioma or port-wine stain or histopathologic terms such as capillary hemangioma, cavernous hemangioma, or lymphangioma (**Mulliken et al., 2000**).

The management of vascular anomalies is a dynamic and rapidly developing subspecialty, which requires interdisciplinary care and collaboration (**Al-Adnani et al., 2006**).

With greater understanding of classification and diagnosis, as well as with the numerous areas of research bringing further awareness on the complexity of these lesions, we are improving our ability to treat them (***Buckmiller & Lisa , 2004***).

Many new developments in the basic science of these lesions are allowing better understanding of why these lesions occur while improving our management in these patients (***Buckmiller & Lisa, 2004***).

So, we try in this work to uncover the hidden areas in vascular malformations of extremities and their management.

### **Aim of the work**

This study is designed to understand the nature, the course, the pathology, how to diagnose, and how to treat the vascular malformations of the extremities.

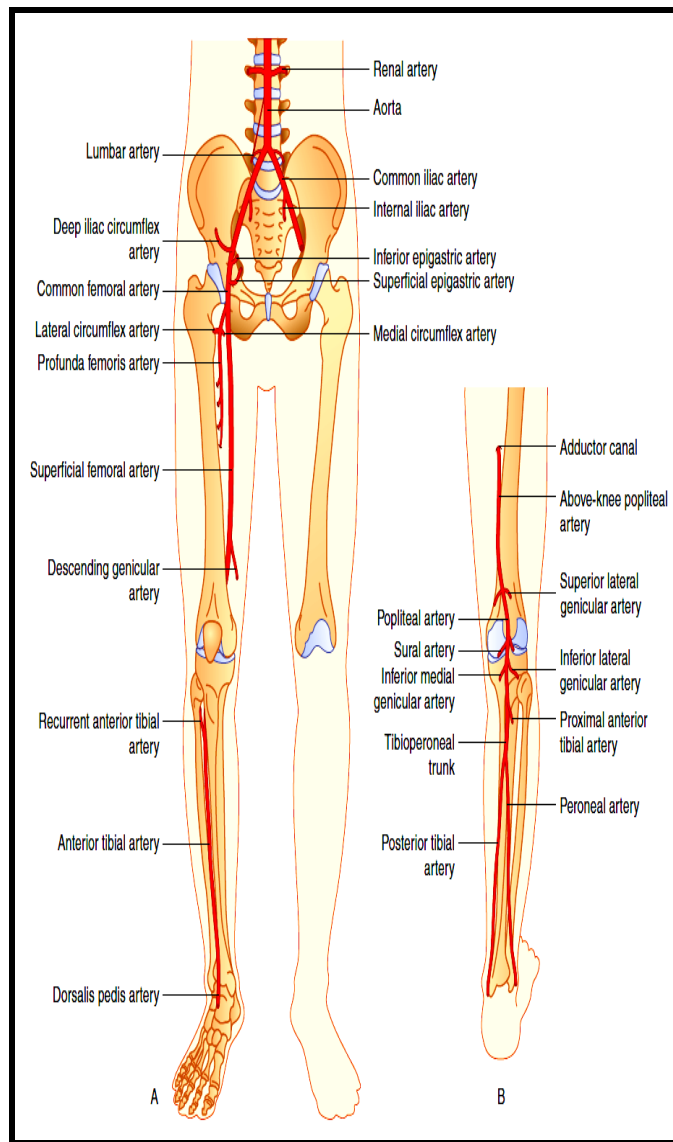
## **Gross anatomy**

### **ANATOMY OF THE LOWER LIMB ARTERIAL SYSTEM**

The aorta lies slightly to the left of the midline in the abdomen, and its bifurcation is located at the level of the fourth lumbar vertebra in the region of the umbilicus. The aorta divides into the left and right common iliac arteries (CIA) at the aortic bifurcation (***Thrush & Hartshorne, 2005***).

The CIA divides into the external and internal iliac arteries at the iliac bifurcation, which lies deep in the pelvis (***Thrush & Hartshorne, 2005***).

The external iliac artery varies in length (6–12 cm) and gives off the deep circumflex iliac artery and inferior epigastric artery, before becoming the common femoral artery (CFA) at the level of the inguinal ligament. The CFA divides into the deep femoral artery, also known as the profunda femoris artery, and the superficial femoral artery (SFA) at the level of the groin. The SFA follows a medial course down the thigh, becoming the popliteal artery at the level of the adductor canal above the knee (***Thrush & Hartshorne, 2005***).



(Fig. 1)

(Arterial system of the lower limb)

(Quoted from Thrush & Hartshorne, 2005).