
What's new: Management of venous leg ulcers

Approach to venous leg ulcers

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Learning objectives

After completing this learning activity, participants should be able to evaluate and treat the symptoms and signs of early venous disease, prevent or delay the occurrence of venous leg ulcers, assess the differential diagnosis of leg ulcers, and delineate an approach to the evaluation of leg ulcers.

Disclosures

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Leg ulcerations are a common problem, with an estimated prevalence of 1% to 2% in the adult population. Venous leg ulcers are primarily treated in outpatient settings and often are managed by dermatologists. Recent advances in the diagnosis and treatment of leg ulcers combined with available evidence-based data will provide an update on this topic. A systematized approach and the judicious use of expensive advanced therapeutics are critical. Specialized arterial and venous studies are most commonly noninvasive. The ankle brachial pressure index can be performed with a handheld Doppler unit at the bedside by most clinicians. The vascular laboratory results and duplex Doppler findings are used to identify segmental defects and potential operative candidates. Studies of the venous system can also predict a subset of patients who may benefit from surgery. Successful leg ulcer management requires an interdisciplinary team to make the correct diagnosis, assess the vascular supply, and identify other modifiable factors to optimize healing. The aim of this continuing medical education article is to provide an update on the management of venous leg ulcers. Part I is focused on the approach to venous ulcer diagnostic testing. (J Am Acad Dermatol 2016;74:627-40.)

Key words: leg ulcers; lipodermatosclerosis; venous disease; venous leg ulcers; wound healing.

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Abbreviations used:

ABPI:	ankle brachial pressure index
CEAP:	clinical, etiology, anatomy, and physiology
DVT:	deep venous thrombosis
LDS:	lipodermatosclerosis
TcPCO ₂ :	transcutaneous pressure of carbon dioxide
TcPO ₂ :	transcutaneous pressure of oxygen
VLU:	venous leg ulcer

INTRODUCTION

Leg ulcers are a common problem, with an estimated prevalence of 1% to 2% in the adult population, similar to the prevalence of psoriasis and alopecia areata.¹⁻³ With shifting demographics toward an aging population, sedentary lifestyles, an increased prevalence of obesity, and the emergence of various chronic diseases, leg ulcers will likely continue to be a significant burden on the health care system.^{4,5} Despite the myriad potential causes of leg ulcers, a majority are caused by vascular abnormalities, with venous disease being the most common cause. Recent advances in the diagnosis and treatment of leg ulcers combined with the latest available evidence indicate a need for an update on this topic. A systematized approach and the judicious use of advanced expensive therapeutics are critical. The aim of this continuing medical education article is to provide an update on venous leg ulcers (VLUs). Part I is focused on the diagnostic approach to VLUs. In part II, the current medical and surgical management options will be reviewed.

EPIDEMIOLOGY**Key points**

- **Approximately 1.5 to 3 per 1000 adults have active leg ulcers in North America**
- **Venous leg ulcers are more common in elderly patients, but 22% of individuals develop their first venous leg ulcers by 40 years of age, and 13% by 30 years of age**

The overall incidence of venous disease has been documented to be 76.1 per 100,000 person-years.⁶ It is estimated that approximately 1.5 to 3 per 1000 North American adults have active leg ulcers.⁷ Although chronic leg ulcers may be caused by many pathologies, upwards of 70% are related to venous disease, and approximately 20% are caused by arterial insufficiency or mixed arteriovenous disease.^{8,9} The annual prevalence for individuals 65 to 95 years of age is reported as 1.69%; the overall male incidence is 0.76% and the female incidence is slightly higher (1.42%).¹⁰ Previous epidemiologic

studies identified a number of risk factors for venous disease, including the following: advanced age, female sex,^{11,12} a family history of leg ulcers, non-Hispanic white race, obesity, a history of deep venous thrombosis (DVT) or phlebitis, previous serious traumatic leg injury, chronic lower extremity edema, a sedentary lifestyle, and any occupation requiring prolonged long periods of standing.¹³⁻¹⁵

Although VLUs are more common in elderly patients, 22% of individuals develop their first VLUs by 40 years of age and 13% before 30 years of age, affecting their ability to work and participate in social activities. As a result, many patients living with chronic leg ulcers experience a diminished quality of life, acute and chronic pain, and associated physical disabilities.¹⁶ While upwards of three quarters of VLUs heal after 6 months, the annual reported recurrence rates range from 6% to 27%.^{17,18} High recurrence rates may be attributable to persistence of underlying disease and a number of psychosocial and economic factors.^{7,19} However, even when best practice pathways are implemented, only 50% to 75% of leg ulcers achieve complete healing after 6 months of treatment.²⁰

PATHOPHYSIOLOGY OF VENOUS DISEASE/VENOUS ULCERS**Pathogenesis of venous disease****Key point**

- **Valve dysfunction, outflow obstruction, arteriovenous malformation, and calf muscle pump failure contribute to the pathogenesis of venous disease**

The venous system is constructed like a ladder, with deep and superficial veins forming the 2 sides connected by perforator veins as the rungs (Fig 1). The calf muscle pump acts as a “peripheral heart,” propelling venous blood toward the heart during calf muscle pump contraction. Unidirectional valves in the vein allow blood flow in 1 direction toward the heart and prevent reverse flow or reflux. However, pooling of venous blood (venous disease) can occur if: (1) the valves are damaged from congenital conditions, trauma, recurrent infection, or inflammation caused by a DVT resulting in reverse flow or leakage around the closed valves; (2) there is obstruction associated with previous clotting with a DVT, or outflow obstruction caused by obesity, pregnancy, or a pelvic mass/growth; (3) arteriovenous malformations as a congenital disease composed of abnormal connections of arteries and veins; or (4) the calf muscle pump is ineffective because of muscle wasting, immobility, or limited

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