What's new: Management of venous leg ulcers

Treating venous leg ulcers

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Learning objectives

After completing this learning activity, participants should be able to identify appropriate therapeutic strategies linked to venous and other leg ulcer diagnoses based on the evidence, highlight the role of compression therapy as the key component of venous leg ulcer management, assess educational methods to improve patient adherence to compression and other health promotion measures posthealing, and evaluate venous ulcer patients for referral to specialized centers and when to use adjunctive therapy.

Disclosures

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Venous leg ulcers account for approximately 70% of all leg ulcers and affect 2.2 million Americans annually. After a comprehensive patient and wound assessment, compression therapy remains the cornerstone of standard care. Adjuvant care with topical or systemic agents is used for wounds that do not heal within 4 weeks. Once healed, long-term compression therapy with stockings or surgical intervention will reduce the incidence of recurrence. This continuing medical education article aims to outline optimal management for patients with venous leg ulcers, highlighting the role of a multidisciplinary team in delivering high quality care. (J Am Acad Dermatol 2016;74:643-64.)

Key words: management; medical therapy; surgical intervention; varicose veins; venous leg ulcers.

INTRODUCTION

Venous leg ulcers (VLUs) are an important medical problem. The chronic and recurrent nature of VLUs causes morbidity, severely reduces quality of life, and increases the cost of health care. Standard evidence-based care includes compression therapy and the use of adjunctive agents, which have been shown to accelerate healing, improve quality of life, and likely reduce cost.[1] Emerging therapies, including venous surgical interventions, hold

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Abbreviations used:

ABPI:	ankle brachial pressure index
BSE:	bilayered skin equivalent
CVI:	chronic venous insufficiency
EST:	electrostimulation therapy
FDA:	US Food and Drug Administration
IPC:	intermittent pneumatic compression
LDS:	lipodermatosclerosis
MPFF:	micronized purified flavonoid fraction
MTS:	May–Thurner syndrome
NPWT:	negative pressure wound therapy
RCT:	randomized controlled trials
SEPS:	subfascial endoscopic perforator surgery
VLU:	venous leg ulcer

promise, particularly in the prevention of ulcer recurrence. Before initiating treatment, a comprehensive patient and wound assessment should be performed to evaluate coexisting conditions that may impair healing. This includes addressing anemia, hypoproteinemia, malnutrition, thrombophilia, and patient behaviors, such as smoking (Fig 1).[1-4] In an effort to better understand the basis of treatment, a brief review of underlying pathophysiology is warranted. In healthy patients in the upright position, the venous system must overcome the force of gravity to facilitate the return of blood to the heart. The 2 main forces that make this return possible are active calf muscle contraction (augmented by ankle movement) and the reactive closing of the venous valves. These 2 forces work in concert to propel venous return and prevent retrograde blood flow.[2] A defect in any component of these 2 pathways can lead to venous insufficiency. These defects can include outflow problems, such as venous obstruction, or calf muscle impairment caused by deep venous thrombosis and reflux problems related to dilated veins or incompetent venous valves. In a compromised venous system, venous pressure is not reduced but rather sustained (as opposed to being reduced, which normally occurs) during leg exercise, such as walking, and this is referred to as sustained ambulatory venous pressure or venous hypertension. Sustained ambulatory venous pressure increases hydrostatic pressure within the venous system. The increased hydrostatic pressure forces fluid containing proinflammatory molecules to leak into interstitial tissue. This triggers a cascade of physiologic changes and edema formation, leading to ulcer formation (detailed in part I of this continuing medical education article).

COMPRESSION THERAPY

Key points

- **Compression therapy is critical for the care of venous leg ulcers because it corrects impaired venous return**

Fig 1. Common clinical pictures of venous leg ulcers, which present as shallow ulcers over the medial malleolus surrounded by pigmentary changes.

- **Compression therapy is the mainstay of treatment for patients with venous leg ulcers and can be provided by 3 different techniques: (1) bandage systems, (2) stockings/hosiery, or (3) intermittent compression devices**

The physiologic effects of compression include accelerating venous flow, reducing venous reflux and edema, promoting oxygenation in the surrounding dermal skin tissue, and eventually stimulating fibrinolysis.[3]

Compression therapy can be provided through 3 techniques or types of compression systems. The first is sustained wear bandage systems, typically comprised of ≥2 components. The second is through removable stockings or hosiery. The third is through intermittent compression devices, which are pumps used periodically throughout the day. These compression techniques or systems have several different methods to deliver external pressure to the venous system.

Compression bandages

Compression bandages are classified as either elastic (long stretch) or inelastic (short stretch). Elastic bandages have an extensibility of 100% to 200%; inelastic bandages have an extensibility of 40% to 99%. Elastic bandages contain elastomeric fibers that provide easy stretchability and a sustained "squeeze" as the bandages recoil to their original length (Fig 2, *A*). Optimal use of elastic bandages occurs when the bandage is stretched from the relaxed state to the stopping distance (ie, maximum stretch), then relaxed and applied at 50% stretch to exert elastic energy in both directions of the bandage (Fig 2, *B*). By contrast, inelastic bandages are rigid and resist lateral expansion of the calf muscle during active contractions, such as when walking.