

Open Surgical Reconstruction for Deep Venous Occlusion and Valvular Incompetence



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KEYWORDS

- Deep venous insufficiency • Deep venous obstruction • Venous bypass
- Venous valve repair • Venous valve replacement • Venous valvuloplasty
- Venous transplantation • Venous transposition

KEY POINTS

- First-line therapy for patients with deep venous obstruction is compression therapy and treatment of pathologic superficial or perforator disease. In patients who fail conservative management and have failed or have no endovascular options, open venous bypass can be considered.
- Of venous bypasses, the Palma procedure has the best patency and clinical outcomes. Hybrid procedures for femoral occlusive disease and complex reconstructions for ilio-caval disease have a more guarded outcome.
- First-line therapy for patients with deep venous valvular insufficiency is compression therapy and treatment of any concomitant superficial or perforator reflux or obstructive disease amenable to endovascular techniques. In patients who have persistent significant clinical disease, open surgical repair can be considered.
- Valvuloplasty is first choice in patients with significant clinical symptoms who have intact and incompetent valves.
- In patients without intact valves, the options are vein transposition, valve transplant, and autologous neovalve creation, which are generally selected in that order and based on available anatomic conditions.

INTRODUCTION

Venous insufficiency and/or venous occlusive disease affecting the superficial, perforator, or deep veins of the lower extremity are common problems affecting a significant proportion of the United States population. These conditions are

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frequently comorbid in patients^{1,2} and, either alone or in combination, manifest as lower extremity venous hypertension with resultant signs and symptoms (the venous stasis syndrome). The underlying pathologic complication, regardless of the anatomic location, can manifest itself on a spectrum ranging from no physical findings, telangiectasias, or reticular or varicose veins, to swelling, chronic skin changes, or ulcerations (clinical, etiologic, anatomic, and pathologic [CEAP] classification).³ Patients may have no or mild or moderate associated discomfort (eg, pain, itching), venous claudication, or constant pain. It is estimated that 150,000 new cases of venous stasis syndrome and more than 20,000 new venous ulcers are diagnosed annually.⁴ In a population study, 7% to 20% of adults older than age 50 years were noted to have venous stasis skin changes. Another study reported trophic changes in 6.2% of adults studied with incidence increasing with age; 22% of legs with trophic changes had deep functional disease defined as either reflux or obstruction (9% of individuals and 5.6% of legs). In this study, superficial disease alone was almost 3 times more common than deep disease with or without commitment superficial disease (14.9% vs 5.6%). Superficial disease was present in 48% of legs with deep disease.⁵ So, although a significant component of venous disease is located in the superficial (great saphenous vein [GSV] or small saphenous vein) or perforator systems, and is treated conservatively and/or with endovascular options, there remains a subset of patients afflicted with deep venous disease who require treatment to alleviate persistent symptoms. Some deep venous occlusive disease is amenable to endovascular options, which is generally the first option chosen by the patient and their physician due to its minimally invasive nature. However, a smaller number of patients with deep venous disease will ultimately require an open surgical repair to provide some relief. The goal of this article is to outline general indications for intervention and options for reconstruction for deep venous occlusive disease and deep venous valvular incompetence.

DEEP VENOUS OCCLUSIVE DISEASE

With limited data available, recommendations for surgical intervention in venous obstructive disease are based on a mixture of observational studies, case series, and expert opinion (grade 2C recommendations).⁶ Similar to endovascular interventions, patients should have failed conservative management, which generally includes at least 3 months of compression therapy, as well as elevation of the extremity, especially at night, with or without wound care as needed. Because of the increased risks and potentially modest benefit associated with an open operative approach, surgical interventions are often considered in patients with more advanced venous disease. Based on the CEAP classification of venous disease, these patients generally have significant skin changes and are at risk of (C4b) or have had (C5) or have (C6) lower leg ulcers. According to the most recent Society for Vascular Surgery and American Venous Forum guidelines, patients with infrainguinal obstruction and CEAP score of C4b or greater might be considered for surgical reconstruction. However, in patients with iliac vein or inferior vena cava (IVC) occlusive disease, surgical reconstruction is currently recommended only in patients with recalcitrant venous ulcers who have failed endovascular reconstruction.⁶ It should be noted, however, that the level of evidence is 2C at best. Symptomatic patients without ulcerations and a CEAP score of C3 and higher have been offered surgery by experienced practitioners with acceptable outcomes.^{1,7-9}

Approaches for open surgical reconstruction for deep venous occlusion are based on the anatomic location, the extent of the obstruction, and the availability of

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