

CLINICAL VASCULAR EXAMINATION

Raymond G. Cavaliere, DPM

Peripheral vascular disease includes a group of distinct diseases and syndromes with well-defined clinical features which involves the arterial, venous and lymphatic systems. Although their etiologies and manifestations are as diverse from one another as in any other group of systemic diseases, changes seen in the extremities can be easily diagnosed. Although clinical vascular examination will be described, one must never forget to elicit appropriate histories before any diagnosis of peripheral vascular disease is made. The state of circulation can be modified by many factors including, ingestion of food and alcohol, smoking of tobacco, exercise, emotion, position of the limb, environmental temperature, drugs and many disease states. Any positive findings may have direct etiological or prognostic value.

PHYSICAL EXAMINATION

The importance of a complete physical examination can not be overstated. The status of the heart is vital to the diagnosis, treatment and prognosis of many peripheral vascular disorders. Blood pressure differences between both arms could point to coarctation of the aorta or other large vessel stenosis or lesion. Previously undetermined hypertension could prove to be of either etiologic or prognostic significance for lower extremity peripheral vascular disorders.

Examination of the ocular fundus may reveal clues to systemic diseases such as exudates and connective tissue disorders, diabetic or hypertensive changes, and other atherosclerotic/lipid disorder changes.

I. EXAMINATION TO DETERMINE ARTERIAL COMPETENCY

A. Arterial Pulsations

1. Palpation (for tenderness, nodules and grading) (Table 1, Fig. 1A-E)
2. Doppler
3. Auscultation over large and medium sized arteries.
 - a. Carotid, subclavian
 - b. Abdominal aorta
 - c. Iliac
 - d. Femoral
 - e. Popliteal
- B. Collateral Arterial Circulation
 1. Aberrant pulsation
 2. Absent pulsation / warm limb
- C. Allen Test to Detect Occlusive Lesions
 1. Allow for detection of occlusion of the dorsalis pedis artery or the tibial artery distal to the ankle.
- D. Elevation/Dependency Test With Observation for Changes in Color
- E. Venous Filling Time
- F. Doppler Evaluation
 1. Wave forms ankle - brachial index
 2. Qualitative evaluation
- G. Segmental Pressures
- H. Digital Plethysmography

TABLE 1
GRADING OF ARTERIAL PULSATIONS
FROM 0 - 4

0	Absent
1	Marked Impairment
2	Moderate Impairment
3	Slight Impairment
4	Normal

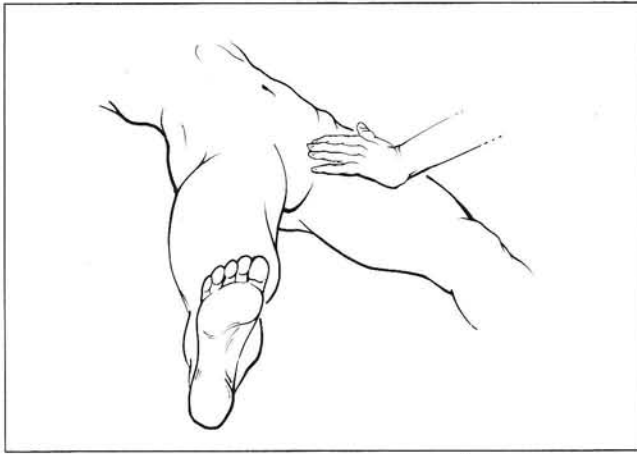


Fig. 1A. Palpation for pulsations in femoral artery

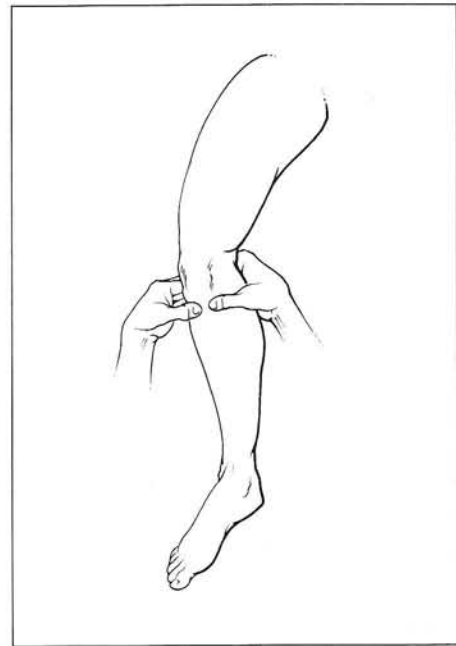


Fig. 1B. Palpating the popliteal artery

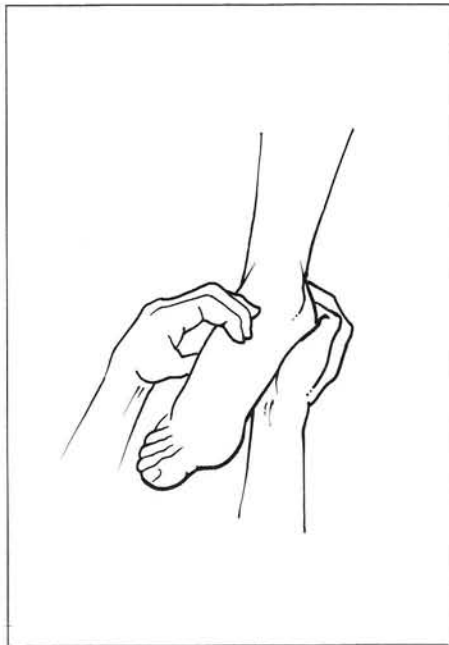


Fig. 1C. Palpating the dorsalis pedis artery

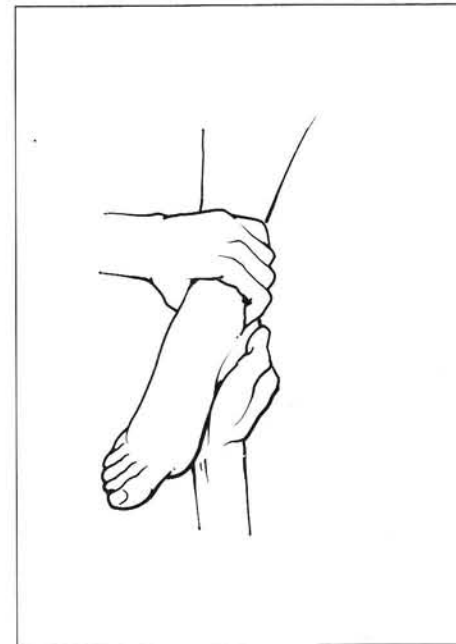


Fig. 1D. Palpating the posterior tibial artery

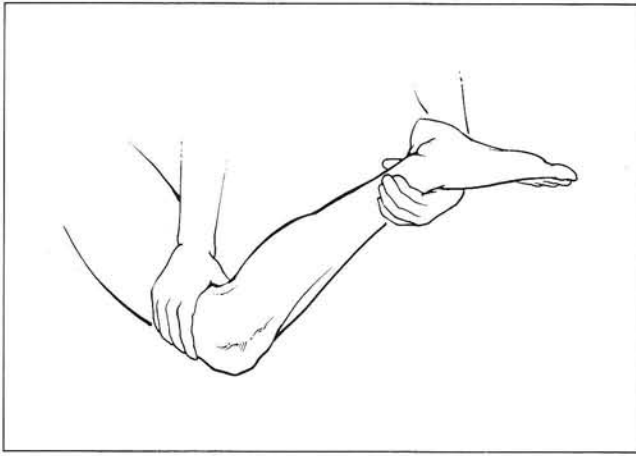


Fig. 1E. An alternative method to palpate for pulsations in the popliteal artery.

- I. Others to include the significance of radiographs, bone scans, digital subtraction angiography and arteriography
- II. CLINICAL TESTS REFLECTING THE STATE OF NUTRITIONAL CIRCULATION IN THE EXTREMITIES.
 - A. Test for Determining the status of the Cutaneous Circulation
 1. Nutritional disturbances of the skin
 2. Alterations in skin temperature
 3. Alteration in sweating
 4. State of the nails
 5. Growth of the hair
 6. Skin color (normal and postural to include the importance of pallor, rubor and cyanosis)
 7. Skin discoloration
 8. Subpapillary venous plexus filling time
 9. The reactive hyperemia test
 10. Skin color changes on pressure (the capillary filling time).
 - B. Test for Determining the State of Muscle Circulation
 1. Claudication time and distance
- III. CLINICAL PROCEDURES FOR THE STUDY OF VENOUS CIRCULATION IN THE EXTREMITIES.
 - A. Clinical evaluation of the Superficial Venous System
 1. Superficial thrombophlebitis
 2. Varicosities (the Brodie-Trendelenburg test and others)

B. Clinical evaluation of the Deep Venous System

1. Deep venous thrombophlebitis
2. Test to determine the patency/competency of deep venous system.

EVALUATION OF EDEMA

When edema of the legs is present and cannot be ascribed to systemic disease, it may due to abnormalities in the lymphatic and/or venous circulation. Other causes include the effects of drugs, orthopedic abnormalities and other diseases localized to the lower extremity. (Table 2) Utilizing the clinical vascular examination, one should be able to make a diagnosis regarding the cause of lower extremity edema.

TABLE 2

CAUSES OF LOWER EXTREMITY EDEMA

- Physiological Edema
- Lymphedema
- Lipedema
- Edema of DVT
- Edema of Chronic Venous Insufficiency
- Drug - Induced Edema
- Other causes
 - Pretibial Myxedema
 - Edema of Livedo Reticularis
 - Edema Due to Compression of the Poplite Vein
 - Angioneurotic Edema
 - Edema Due to Musculoskeletal Problems
 - Edema Following Surgery
 - Edema Secondary to Occult Carcinoma

DIFFERENTIAL DIAGNOSIS OF ULCERATIONS

Many lower extremity ulcers are due to peripheral vascular disease states and therefore can be readily identified through a systemic clinical examination and appropriate history taking. One should remember that some ulcers are secondary to dermatologic, endocrine and hematologic disorders. The ulcer location, the quality or absence

of pain and the clinical vascular examination should be considered in the overall ulcer assessment.

CONCLUSION

Peripheral Vascular Disease is a challenging topic for study as well as for proper clinical evaluation and management. The roll of the podiatric physician includes proper evaluation and diagnosis with treatment of local manifestations of the disease. In many cases, preventative treatment can prevent loss of a limb. Adequate referral and a team approach are indicated in many cases.

BIBLIOGRAPHY

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- Bernstein EF: *Non-Invasive Diagnostic Techniques in Vascular Disease*, 3rd Ed, St. Louis, CV Mosby Co. 1985.