

I wish to emphasize the importance of the Sulkowitch test in determining the excretion of calcium. It is of importance in determining the efficacy of treatment of parathyroid insufficiency with calcium and vitamin C. It is of greater importance, as emphasized by Albright and his group, in the diagnosis of hyperparathyroidism. This easily performed diagnostic test should be used for every patient suspected of having this disease and every patient who has renal stones. The earlier we can diagnose hyperparathyroidism, the less damage will have been done to the patient.

VASCULAR CLINICS. X.
LIPDEMA OF THE LEGS: A SYNDROME CHARACTERIZED
BY FAT LEGS AND ORTHOSTATIC EDEMA

E. V. Allen, M. D., and E. A. Hines, Jr., M. D., Division of Medicine: We wish to describe a clinical syndrome, lipedema of the legs, which is frequently very distressing. In our experience it affects solely women. The chief complaint is of swelling of the legs and feet which has been present for many years; in some instances, first noted in girlhood. On questioning, the physician may elicit that enlargement of the limbs has always been generalized and symmetrical. Usually, it is associated with gradual increase in body weight. There is never a history of recurrent episodes of acute cellulitis such as may occur in the course of lymphedema. The swelling below the knees is accentuated when patients are on their feet much and in warm weather. Aching distress in the legs is common. In many instances, there is a history of a similar condition in other members of the family. Ordinarily, such patients are very sensitive about the appearance of their limbs; they wear long skirts and stand behind chairs when in the presence of strangers. They avoid swimming. Evidence of neurosis is likely to be found. Occasionally, a patient feels that her large legs have "ruined her life." Many are "ashamed" of their legs.

ANATOMIC AND PHYSIOLOGIC BASIS

The basic difficulty in lipedema is the deposition of an unusual amount of fat beneath the skin. An intake of food exceeding the caloric requirements of the body is the obvious cause in cases of generalized obesity. The deposition of fat beneath the skin of the buttocks and legs only, is not easily explained although in many instances it is a hereditary trait. Whatever the basis for increased subcutaneous fat may be, it offers abnormally poor resistance to the passage of fluid into the tissue from the blood and thus permits edema to occur.

Edema is a manifestation of disturbed exchange between the fluid of the blood and that of the tissue. If more fluid than usual leaves blood vessels or if the removal of fluid from the limb is hindered, edema results. Although the transfer of fluid from blood to tissue is primarily controlled by capillary and colloid osmotic pressure, it is greatly influenced by a number of secondary factors, particularly by posture. There is a great tendency toward edema of the feet of well people when they are in the erect posture because the venous pressures rise to as much as 120 cm. of water. Edema is prevented in the erect posture in normal persons as a

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result of an increase in colloid osmotic pressure in the blood of the veins of the feet, as a result of a decrease in volume and velocity of circulation of blood in the legs and as a result of an increase in tissue pressure due to filtration of fluid from blood vessels into extravascular spaces. In the erect posture, this increase in tissue pressure seems to be three to five times as important in limiting loss of fluid from the blood as is the increase in colloid osmotic pressure.^{1,2} More simply stated, a very important mechanism in preventing edema in the erect posture is that by which fluid which leaves the blood vessels and enters the extravascular spaces thereby increases the tissue pressure; this condition in turn hinders the further filtration of the fluid of the blood into tissue spaces. When a person first

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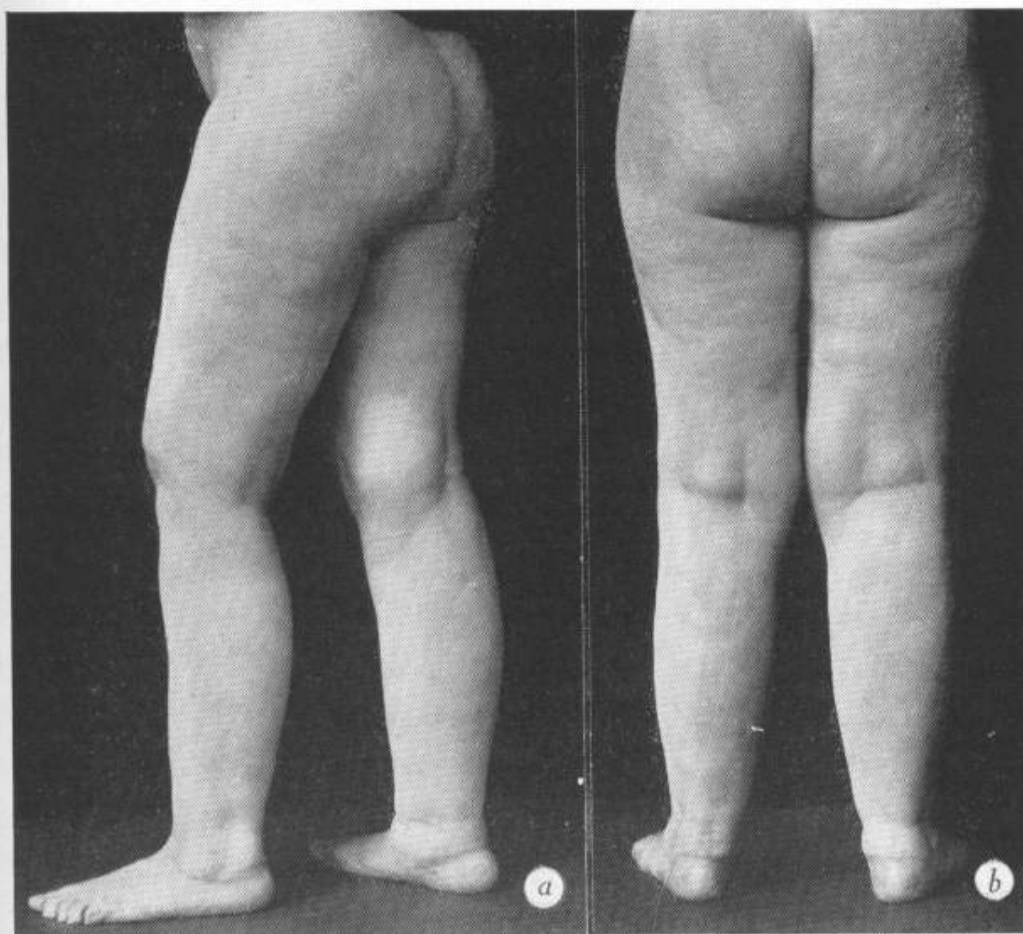


Fig. 1. Lipedema of the lower extremities of a woman aged forty-six years; a, left lateral aspect; b, posterior aspect.

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stands, the filtering pressure exceeds the antifiltering pressure but equilibrium occurs in about thirty minutes. If edema occurs as a result of standing, equilibrium is reached only after more than the ordinary amount of fluid has passed from the blood into extravascular spaces.

An obviously very important extravascular factor in determining when tissue pressure will become great enough to prevent further loss of fluid

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1. Youmans, J. B., Wells, H. S., Donley, Dorothy, and Miller, D. G.: The effect of posture (standing) on the serum protein concentration and colloid osmotic pressure of blood from the foot in relation to the formation of edema. *J. Clin. Investigation* 13: 447-459 (May) 1934.
2. Youmans, J. B., Akeroyd, J. H., Jr., and Frank, Helen: Changes in the blood and circulation with changes in posture; the effect of exercise and vasodilatation. *J. Clin. Investigation* 14: 739-753 (Nov.) 1935.

from blood to tissue is tissue tone. If tissue tone is great edema may be prevented by tissue pressure. If tissue tone is slight, edema may occur because tissue pressure will not become great enough to prevent extensive loss of fluid from the blood to the tissue until edema has occurred. This is the situation in cases of lipedema.

PHYSICAL FINDINGS

Invariably, obesity of the legs and buttocks is present (fig. 1*a* and *b*). The adipose tissue is of a peculiar loose texture. The skin and subcutaneous tissues are soft and pliable. Near the end of a day of activity, some edema may be demonstrable but even shortly after arising from bed in the morning the limbs are large. The edema usually does not involve the feet. Generalized obesity may be present or absent. The weights of



Fig. 2. Lipedema of the lower extremities of a woman aged forty-eight years. The edema could not be explained on the basis of the superficial minor varices.

five illustrative patients were 176, 167, 152, 145 and 132 pounds, respectively. The flesh of the legs below the knees is sensitive to pressure and to pinching. Varices are usually absent but even if they were present, the enlargement of the extremity would not thus be explained (fig. 2).

DIFFERENTIAL DIAGNOSIS

The usual erroneous diagnosis made is lymphedema. In many instances, Milroy's disease is diagnosed because several members of a family may be affected. The points of differentiation are listed in table 1.

TREATMENT

The treatment of lipedema is usually unsatisfactory. In cases of generalized obesity, sharp reduction of weight may help. In cases of obesity affecting only the region below the waist, reduction of weight may cause but little reduction of the localized obesity. The restriction of fluids and

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the use of diuretics such as potassium nitrate are usually without benefit. Reassurance that the condition is not hazardous to health or to life is important. Particularly is it important to inform the patient that "Bright's disease" and heart disease are absent. Heat and gentle massage may relieve the distress. If activity on the feet causes much accentuation of swelling, elastic stockings may be tried but the discomfort caused by them frequently exceeds the benefit realized from their use. A sympathetic discussion of the nature of the condition (with the patient) and an explanation of the physiologic basis are usually helpful. A kindly presentation of the probability that the patient may need to accept the situation and encouragement of the patient to readjust her life and reactions to an unavoidable situation and to live normally may give her courage to do so. In some instances, plastic surgical procedures may be of benefit.

Table 1
Differential diagnosis

Characteristics	Lipedema	Lymphedema
Sex	Women only	Men and women
Obesity	Present	Present or absent
Region involved	Always both limbs	Usually one limb
Pain on pressure	Usually present	Usually absent
Progression	All parts of limb are involved simultaneously	From distal portion of limb, proximally
History of episodes of acute cellulitis	Absent	Occasionally present
Nature of swelling	Usually soft	Usually firm
Pitting edema	Usually minimal	Usually marked
Effect of elevation	Persistent enlargement	Reduction to normal size in early stages
Family history of large legs	Frequently obtained	Almost always not obtained

BOOK REVIEWS

"An introduction to gastro-enterology" by W. C. Alvarez (Edition 3, New York, Paul B. Hoeber, Inc., 1940) is reviewed in the *North Carolina Medical Journal* 1: 123, and in *Southwestern Medicine* 24: 75 (Feb.) 1940.

"Electrocardiographic patterns: their diagnostic and clinical significance" by A. R. Barnes (Springfield, Illinois, Charles C. Thomas, 1940) is reviewed in the *American Journal of Medical Sciences* 199: 406-407, and in the *Ohio State Medical Journal* 36: 334 (Mar.) 1940.

"Clinical diagnosis by laboratory methods" by J. C. Todd and A. H. Sanford (Edition 9, Philadelphia, W. B. Saunders Co., 1939) is reviewed in the *Journal of the American Medical Association* 114: 917 (Mar. 9) 1940.

"Diseases of the gallbladder and bile ducts" by Waltman Walters and A. M. Snell (Philadelphia, W. B. Saunders Co., 1940) is reviewed in the *North Carolina Medical Journal* 1: 176 (Mar.) 1940.