Lipedema, a frequently unrecognized problem

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Lipedema is characterized by symmetric lower extremity enlargement secondary to the deposition of fat. Lipedema is not rare, but it is commonly misdiagnosed as lymphedema. We describe a 20-year-old woman with massive lower extremity enlargement that did not respond to compression therapy. Magnetic resonance imaging of the lower extremities helped to confirm the diagnosis. (J Am Acad Dermatol 2007;57:S1-3.)

Lipedema is a syndrome characterized by bilateral, symmetric lower extremity enlargement due to subcutaneous deposition of fat.[1,2] Involvement typically extends from the buttocks to the ankles; the feet are much less involved or spared entirely.[2-4] Lipedema affects women almost exclusively, typically developing insidiously after puberty and progressing gradually.[1-4] This condition bears some clinical resemblance to lymphedema and is frequently misdiagnosed as such.[1-4] However, in contrast to lipedema, the swelling of lymphedema is due to accumulation of protein-rich interstitial fluid within the skin and subcutaneous tissue caused by lymphatic dysfunction.

Key features of the patient's history and physical examination can distinguish lipedema from lymphedema (Table I). Notably, lipedema responds poorly to compression therapy and causes few epidermal changes.[3-5] In addition, looking for Stemmer's sign (the presence of a skin fold too thick to pinch at the base of the second toe), a finding pathognomonic of lymphedema, has a negative result in lipedema.[6,7]

We describe a patient with massively enlarged lower extremities who, in previous years, had been diagnosed with lymphedema. Despite nearly a year of compression and massage therapy early in the course of the enlargement, the enlargement progressed. On the basis of the patient's history and physical findings, we suspected lipedema. Magnetic resonance imaging (MRI) helped to establish the diagnosis.

From the Department of Dermatology, Johns Hopkins University.
Funding sources: None.
Conflicts of interest: None declared.
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0190-9622/$32.00

doi:10.1016/j.jaad.2006.09.023

CASE REPORT

A 20-year-old morbidly obese, wheelchair-bound Caucasian woman with spina bifida and insensate limbs presented to the Johns Hopkins Wound Center at Bayview for evaluation of a nonhealing, traumatic ulcer. The wound was a well-demarcated, noninflamed, 1.5- × 0.7-cm lesion with a depth of 1 cm on the lateral aspect of the left leg. The patient denied pain in the lesion, but lacked sensation below the waist bilaterally secondary to her spina bifida.

The patient was also concerned by worsening enlargement of her lower extremities that had been inexorably developing over the previous 7 years. The condition had previously been diagnosed as lymphedema, but a year of compression and massage therapy early in its course had not affected the progressing enlargement. Because of this apparent treatment failure, the patient and her physicians decided to stop lymphedema therapy at that time. She had not been treated with compression therapy for several years at the time of this presentation.

Physical examination revealed massive bilateral lower extremity enlargement (Fig 1) with minimal pitting. Although the patient was morbidly obese, the legs were extremely out of proportion to the upper body. There were firm subcutaneous nodules palpable over both legs, but the overlying skin was normal in appearance and texture. Most remarkable was the lack of epidermal change, verrucous hyperplasia, sclerosis, or discoloration characteristic of lipodermatosclerosis or elephantiasis. There was moderate edema of the dorsal foot and a positive result for Stemmer's sign.

Evaluation of a lower extremity MRI revealed marked circumferential enlargement of the subcutaneous tissue due to fatty hypertrophy. Fat lobules were surrounded by thick, fibrous septa and there was thickening of the overlying dermis (Fig 2).

DISCUSSION

Lipedema is not a rare condition; up to 11% of women or postpubertal girls may be affected to some

Table I. Characteristics distinguishing lipedema and lymphedema[1-5,7-11]

Clinical feature*	Lipedema	Lymphedema
Gender	Women almost exclusively	Women and men
Age at onset	Often around puberty	Any age
Distribution	Bilateral lower extremities, symmetric involvement	Unilateral, or one leg affected more severely
Epidermal change	Absent	Present
Foot involvement	Absent, negative Stemmer's sign	Present, positive Stemmer's sign
Buttock involvement	Present	Absent
Nature of swelling	Soft, minimally pitting	Firm, often markedly pitting
Tenderness	Common with pressure	Uncommon
Easy bruising of affected area	Present	Absent
Improvement with elevation and compression	Minimal	Marked
Family history	Frequent	Less common
History of cellulitis, lymphangitis, and venous disease	Uncommon	Frequent
Angiosarcoma risk	No	Yes
MRI findings	Homogenous increase in subcutaneous fat with little/no fibrosis, no skin thickening	Honeycomb pattern fibrosis, edema fluid, skin thickening

MRI, Magnetic resonance imaging.
*Features of both lipedema and lymphedema may be present in patients with lipolymphedema.

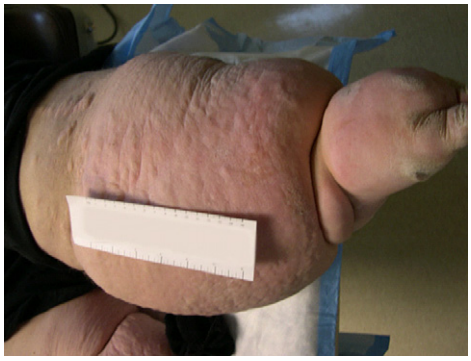

Fig 1. Massively enlarged lower extremity with firm subcutaneous fatty nodules but little epidermal change.

degree.[8] The diagnosis is frequently missed because clinicians lack familiarity with lipedema and because it clinically resembles lymphedema.[1-4] In lymphedema, lymphatic dysfunction causes protein-rich interstitial fluid to accumulate within the skin and subcutaneous tissue, producing swelling. In contrast, lipedema results from the subcutaneous deposition of fat and occurs independently of lymphatic or venous insufficiency.[3,7,9]

Patient history and physical examination are usually sufficient to differentiate lipedema from lymphedema (Table I), although when lipedema has persisted for several years, the distinction may become blurred. Patients with severe, long-standing lipedema may eventually develop mechanical insufficiency of the lymphatic system and superimposed lymphedema, producing "lipolymphedema".[7,8] In lipolymphedema, the initially soft lipedematous tissue may become firm and nodular. Foot enlargement, including a positive Stemmer's sign, may develop (Fig 3).[7,8]

Progression to lipolymphedema has likely occurred in our patient. The bilateral symmetry and lack of epidermal change support a diagnosis of lipedema, but the firm subcutaneous nodules, moderately edematous dorsal aspect of the foot, and positive Stemmer sign suggest superimposed lymphatic involvement. Because our patient's clinical features were complicated, we reviewed a lower extremity MRI to help clarify the diagnosis. Findings consistent with both lipedema and lymphedema were apparent (Fig 2, Table I), pointing to a diagnosis of lipolymphedema.[10,11]

The etiology of lipedema is unknown. Many patients with lipedema have a family history of similarly enlarged legs,[1,2,4] suggesting a genetic basis. The body's hormonal milieu also appears to play a role, given that lipedema occurs almost exclusively in women and onset occurs typically during puberty or other periods of hormonal change, including pregnancy and menopause.[1-4,7,8] Moreover, the rare cases of lipedema in males have tended to be in patients with hepatic cirrhosis or in men receiving hormonal therapy (eg, for prostatic carcinoma).[7,8] Although obese patients may be overrepresented among those with lipedema, persons of normal weight are also commonly affected.[1-4] Thus obesity itself is unlikely

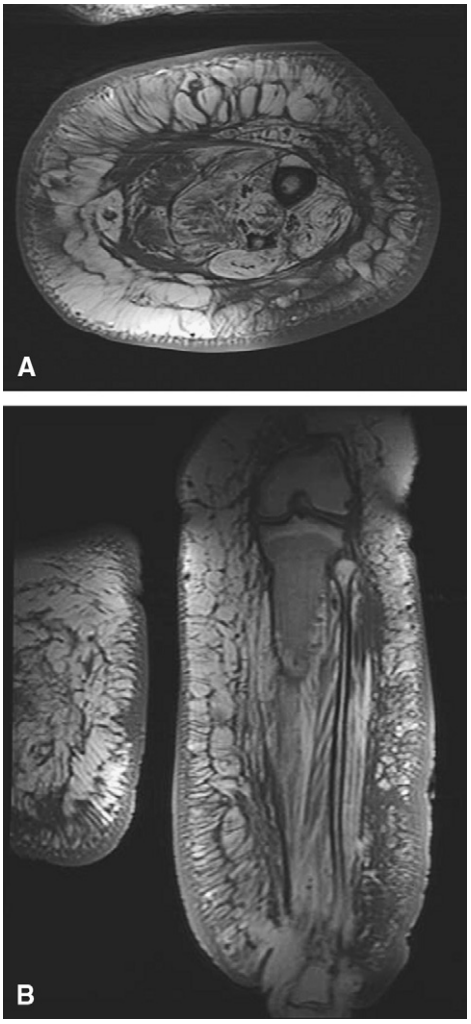

Fig 2. **A**, Axial and **B**, coronal T1-weighted lower extremity MRIs show massive circumferential enlargement of the subcutaneous tissue occupied by fat lobules and fibrous septa.

to be a major determinant of this syndrome. There are no known associations of lipedema with spina bifida or paraplegia, nor are there any described lipedema-associated congenital syndromes. Lipedema does not predispose a person to ulcer development.[3]

Treatment options for lipedema are limited. Dieting, diuretics, leg elevation, and compression appear to be of minimal benefit,[1-5,7] and attempts to treat invasively via lipectomy or liposuction[4,12] are not recommended because they risk causing mechanical damage to the lymphatics.[7,8] Macdonald, Sims, and Mayrovitz[7] remarked that "[p]erhaps the most important service provided by the physician is emotional support and reassurance that this disability is not the patient's fault."

Although long-term low-level compression therapy is unlikely to reverse lipedema, it may help prevent its worsening and progression to lipolymphedema.[3,5] Perhaps if our patient had consistently received compression, the complicating lymphedematous component might not have developed. Once the progression to lipolymphedema has occurred, as in our patient, lymphedema therapy (reviewed in Macdonald, Sims, and Mayrovitz[7]) is required.

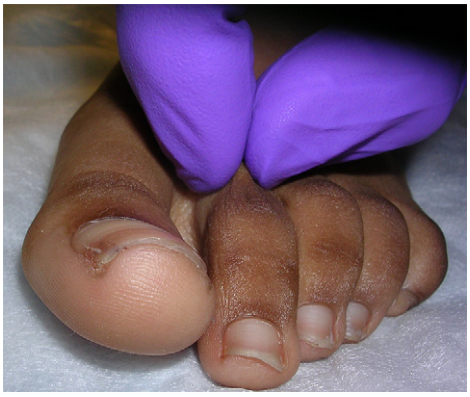

Fig 3. Assessing Stemmer's sign. A positive Stemmer's sign is a skin fold at the base of the second toe too thick to lift. In this image, Stemmer's sign is negative because the skin lifts normally when pinched.

We thank Jens Vogel-Claussen, MD, of the Johns Hopkins University Department of Radiology, for reading the MRIs.

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