

Ultrastructural features of lipoatrophia semicircularis in Behçet's disease

Sirs,

A 42-year-old Korean woman presented to our department with asymptomatic, bilateral, linear skin depressions on the anterolateral aspects of the upper thighs that had persisted over four months. The patient's past medical history was significant for Behçet's disease (BD), as diagnosed according to the criteria put forth by the International Study Group for BD, including recurrent oral ulcerations, genital ulcerations, erythema nodosum-like skin lesions, and arthritis (1). The patient had been treated with colchicine and maintained in an inactive disease state for over two years. The patient had been working at a market, usually standing during working hours. She reported that, due to moderate low back pain, she frequently leaned with her thighs against the refrigerator at her workplace.

Physical examination revealed bilateral linear skin depressions on the anterolateral aspects of upper thighs without remarkable textural or colour changes of the skin surface (Fig. 1a). The patient denied any prior symptoms of redness or tenderness or any history of injections, including insulin, corticosteroids, or acupuncture. The results of laboratory tests, including full blood count, blood glucose, renal and liver function tests, C-reactive protein, anti-streptolysin O, rheumatoid factor, antinuclear antibodies, and venereal disease were unremarkable, except for a slightly elevated erythrocyte sedimentation rate at 29 mm/hr.

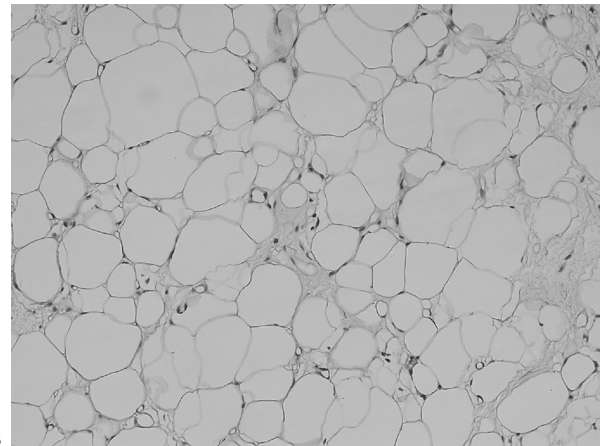
Histopathologically, the specimen showed changes in the subcutaneous fat, in which some of the adipocytes were decreased in size and separated from each other by eosinophilic and hyaline materials. There was some histiocyte and lymphocyte infiltration around the adipocytes (Fig. 1b). Direct immunofluorescence of the biopsy specimen was negative. On the transmission electron microscope image, fat-laden macrophages with lysosomes, numerous fat droplets, and electron dense granules in the cytoplasm as well as lymphocytes were observed in the space produced by the detachment of the fat from the basal lamina (Fig. 2). There was a complete loss of the basal lamina beneath the adipose layer and the cytoplasm of the fat cells was vacuolated. A diagnosis of lipoatrophia semicircularis (LS) was made and four months after her first visit, the patient's lesions had improved slightly without any treatment.

Localised loss of subcutaneous tissue can occur after various forms of panniculitis, drug injections, several infectious diseases, and autoimmune or neurologic disorders. LS is categorised as idiopathic lipoatrophy, or the focal disappearance of subcutaneous fat without definite prior clinical or histologic

Fig. 1. (a) Bilateral symmetrical linear depressions on the anterolateral aspects of both upper thighs. (b) Fat cells are decreased in size and separated from each other by eosinophilic and hyaline materials. A few histiocytes and lymphocytes have infiltrated around the adipocytes (Hematoxylin-eosin stain; original magnification: X200).

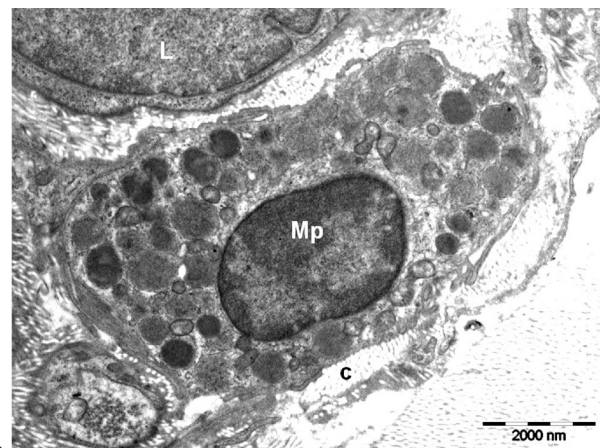


A

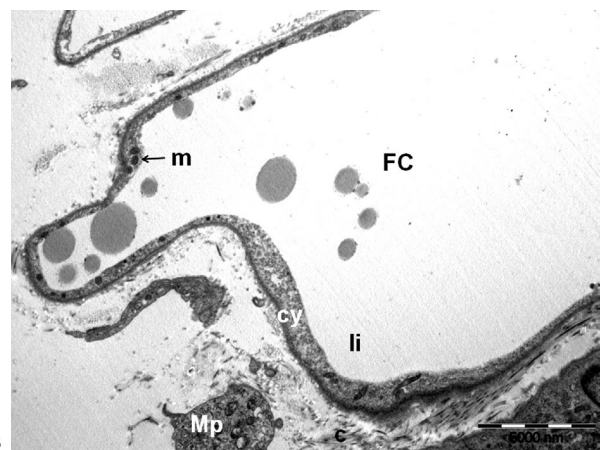


B

Fig. 2. (a) Fat-laden macrophages (Mp) with lysosomes, numerous fat droplets, and electron dense granules in the cytoplasm as well as lymphocytes (L) are observed in the space produced by the detachment of the fat from the basal lamina (transmission electron microscopy X10,000; scale bar: 2,000 nm). (b) Fat cell (FC) demonstrating complete detachment from the basal lamina, and the cytoplasm (cy) of the FC is vacuolated (m, mitochondria; C, collagenous bundles; li, lipid droplet; transmission electron microscopy X5,000; scale bar: 5,000 nm).



A



B

Letters to the editor

inflammatory reaction. The pathogenesis of LS remains unknown. According to previous reports, repeated microtrauma has been suggested as a major pathogenic factor in most but not all case reports (2).

Underlying conditions, especially impaired circulation in the affected regions and underlying rheumatologic disorders, may also be factors (3, 4). Bloch and Runne (3) speculated that patients may have impaired circulation in the affected regions due to congenital abnormalities of the lateral femoral circumflex artery, and that repeated micro-trauma can result in ischemic atrophy of the subcutaneous fat tissue. Haas *et al.* (4) reported the case of a 10-year-old girl who developed LS after treatment of systemic lupus erythematosus with subcutaneous injections of methotrexate. The authors suggested that physical trauma from subcutaneous injections with methotrexate and underlying autoimmune disease might have caused the LS (4).

BD is a systemic inflammatory disease that is a type of vasculitis. Electron microscopic evaluation of erythema nodosum-like lesions in BD patients revealed vacuolar changes of subcutaneous fat cells with detachment

of the cell membrane from the basal lamina that permitted the infiltration of lymphocytes and macrophages (5). In the present study, development of LS in our BD patient can be regarded as an incidental finding. However, our patient's biopsy specimen revealed completely detached fat cells with mixed infiltration of fat-laden macrophages and lymphocytes, which were compatible with the findings of fat cell lysis in erythema nodosum-like lesions of BD.

In conclusion, repetitive trauma to both anterolateral upper thighs may have played a major role in the pathogenesis of LS in this patient with BD, who was prone to inflammatory processes with hypersensitivity of the vascular system.

S.B. CHO^{1*}
B.G. BAE^{1*}
J.E. KWON²
J.M. PARK¹
D. BANG¹

¹Department of Dermatology and Cutaneous Biology Research Institute, and ²Department of Pathology and Brain Korea 21 Project for Medical Science, Yonsei University College of Medicine, Seoul, Korea.

*S.B. Cho and B.G. Bae contributed equally to this work.

Please address correspondence and reprint request to: Dongsik Bang, MD, PhD, Department of Dermatology and Cutaneous Biology Research Institute, Yonsei University College of Medicine, 250 Seongsanno, Seodaemun-gu, Seoul 120-752, Korea. E-mail: dbang@yuhs.ac.

Competing interests: none declared.

References

1. INTERNATIONAL STUDY GROUP FOR BEHÇET'S DISEASE: Criteria for diagnosis of Behçet's disease. *Lancet* 1990; 335: 1078-80.
2. SENEAL S, VICTOR V, CHOUAT D *et al.*: Semicircular lipoatrophy: 18 cases in the same company. *Contact dermatitis* 2000; 42: 101-2.
3. BLOCH PH, RUNNE U: Lipoatrophia semicircularis in the male. Coincidence of arterial variations and micro-traumas as a possible disease cause. *Hautarzt* 1978; 29: 270-2.
4. HAAS N, HENZ BM, BUNIKOWSKI R, KEITZER R: Semicircular lipoatrophy in a child with systemic lupus erythematosus after subcutaneous injections with methotrexate. *Pediatr Dermatol* 2002; 19: 432-5.
5. HONMA T, BANG D, SAITO T *et al.*: Ultrastructure of lymphocyte-mediated fat-cell lysis in erythema nodosum-like lesions of Behçet's syndrome. *Arch Dermatol* 1987; 123: 1650-54.