

# Two Cases of Nodular-cystic Fat Necrosis

You Chan Kim, M.D., Hyang Joon Park, M.D., Yong Woo Cinn, M.D.

*Department of Dermatology, College of Medicine, Dankook University, Cheonan, Korea*

**Nodular-cystic fat necrosis is an unusual, distinctive entity characterized by histologically encapsulated fat necrosis in the subcutis. We report two cases of nodular-cystic fat necrosis. The lesions were subcutaneous nodules. Histopathologically, the nodules showed strong periodic acid-Schiff -positive necrotic adipose tissue with lipomembranous changes and calcification. (Ann Dermatol 13(1) 59~61, 2001).**

**Key Words :** Nodular-cystic fat necrosis, Lipomembranous changes

Nodular-cystic fat necrosis, first described by Przyjemski et al.<sup>1</sup> in 1977, is characterized by histologically encapsulated fat necrosis. It is so rare that only 49 cases (mostly Japanese) have been reported in the literature<sup>2</sup>. We report two additional cases of nodular-cystic fat necrosis developed on the buttocks. To our knowledge, these are the first reported cases in Korean dermatological literature.

## CASE REPORT

### Case 1

A 55-year-old woman presented with an one-year history of a pea sized, mobile, slightly painful subcutaneous nodule on the right buttock. There was no trauma history. Laboratory examinations including hematology, blood chemistry and serum amylase were within normal limits. The excisional biopsy specimen revealed three well-encapsulated nodules of variable size in the subcutis (Fig. 1A). The nodules were composed of adipose tissue showing various amounts of necrosis (Fig. 1B) and they

were strongly periodic acid-Schiff (PAS)-positive. Lipomembranous changes were observed in the nodules except the smallest nodule. No inflammatory cell infiltration was observed in the nodules. Von-Kossa stain-positive calcium deposition was observed only in the largest nodule. The capsules of the nodules were positive with Masson trichrome stain.

### Case 2

A 56-year-old woman presented with a 5-year history of a pea sized, fixed, subcutaneous nodule on the left buttock. She complained of intermittent pain, but there was no history of trauma at the site of the lesion. Excisional skin biopsy showed a solitary well-encapsulated nodule in the subcutis. The nodule was composed of PAS-positive necrotic adipose tissue and was completely encapsulated by thick fibrous tissue (Fig. 2). Lipomembranous changes (Fig. 3) and foci of calcification were observed. No inflammatory cell infiltration was observed in the nodule. Masson trichrome stain demonstrated that the capsule was mainly composed of collagen. There was a separate partial lobule which was composed mostly of viable adipocytes and was surrounded by eosinophilic material. This material stained with PAS, but not with Masson trichrome.

## DISCUSSION

Nodular-cystic fat necrosis is characterized by histologically encapsulated subcutaneous fat

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**Reprint request to :** You Chan Kim, M.D., Department of Dermatology, College of Medicine, Dankook University, Anseo-dong, Cheonan, 330-714, Korea  
Tel: 041) 550-3968, Fax: 041) 562-6542

E-mail: kyccc@anseo.dankook.ac.kr

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**Fig. 1.** Case 1. A. Three well-encapsulated nodules (arrows) of variable size in the subcutis (H&E,  $\times 20$ ). B. A well encapsulated nodule which was composed of necrotic adipose tissue (H&E,  $\times 40$ ).

**Fig. 2.** Case 2. The nodule was composed of PAS-positive necrotic adipose tissue and was completely encapsulated by thick fibrous tissue (H&E,  $\times 20$ ).

necrosis. Clinically the lesions usually present as asymptomatic, multiple, mobile, small nodules<sup>2</sup>. Many authors proposed various names for this disease, mainly nodular-cystic fat necrosis<sup>1,3</sup>, encapsulated fat necrosis<sup>2,4</sup>, and mobile encapsulated lipoma<sup>5</sup>. The term mobile encapsulated lipoma is inappropriate because the lesions in some cases, including our second case, were not mobile<sup>3,6</sup>. The lesions consist of solitary or multiple subcutaneous nodules<sup>7</sup>. Clinically, our case 1 and case 2 showed a solitary subcutaneous nodule respectively, but an excisional biopsy specimen of the first case revealed three well-encapsulated nodules in the subcutis. The lesions usually occurred in two distinct populations: adolescent boys and middle-aged women<sup>3</sup>. The most common location of the lesions was the lower extremities<sup>2</sup>. Also in our cases,

**Fig. 3.** Case 2. Fat necrosis with lipomembranous change (periodic acid-Schiff,  $\times 100$ ).

the lesions occurred on the right buttock in a 55-year-old woman and on the left buttock in a 56-year-old woman. Trauma was documented in more than 25% of patients<sup>2</sup>, but there was no trauma history in our patients.

Nodular-cystic fat necrosis should be differentiated histologically from subcutaneous lipoma<sup>3</sup>. Lipomas are typically surrounded by thin fibrous capsules, however, in contrast to nodular cystic fat necrosis, consist of viable, not necrotic adipocytes.

The pathogenesis of nodular-cystic fat necrosis is unknown. Hurt *et al.*<sup>3</sup> believed that early lesions begin as partial lobules of adipose tissue, because of rapidly compromised blood supply, gradually become completely separated from the surrounding tissue and are subsequently encapsulated by thin fibrous tissue; dystrophic calcification is seen in end stage<sup>3,7</sup>. In our second case, there was a separate

partial lobule which was composed mostly of viable adipose tissue and was surrounded by thin eosinophilic material. Interestingly, the thin capsule stained with PAS, but not with Masson trichrome. As Hurt and Santa-Cruz<sup>3</sup> suggested, we believe that it may be an early lesion which has separated from the surrounding tissue but has not formed collagenous capsule yet. Pujol et al.<sup>8</sup> first described lipomembranous changes in nodular-cystic fat necrosis and suggested that the lipomembranous changes are nonspecific and an uncommon pattern in this disease. However, lipomembranous changes as well as calcification have been observed in most lesions of recent cases<sup>7-9</sup>. In our cases, all the nodules were strongly PAS-positive and showed lipomembranous changes. Calcification was also observed with fat necrosis in the well-encapsulated end-stage lesions in our cases. Our observation seems to support that PAS positivity with lipomembranous change and subsequent calcification may be findings which are frequently seen in the process of fat necrosis in nodular-cystic fat necrosis.

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