

Subcutaneous fat necrosis of newborn children

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Summary. We report a case of subcutaneous fat necrosis of a newborn child which appeared 9 days after birth and was cured without any complications. We propose the reclassification of the etiological factors accompanying this lesion by classifying them in a plurietiological syndrome with some basic or essential factors and other causative factors.

Key words: Fat necrosis, Newborn children

Introduction

Subcutaneous fat necrosis of newborn children is an entity which hardly appears in any bibliography since, in most cases, it follows its course benignantly and may not ever be diagnosed if the pediatrician, dermatologist and pathologist do not work on it together (Moreno et al., 1983).

The main differential diagnosis should be made with the sclerema neonatorum, which is not difficult with a histological study (Lever and Schaumberg-Lever, 1983), but there are no differences in the type of crystals observed at an ultrastructural level (Balazs, 1987), as was first thought (Proks, 1964). The etiology and physiopathology of subcutaneous fat necrosis of newborn children, as well as its complications, remain unknown in spite of the publication of several case reports. We propose the cataloging of this lesion as a plurietiological syndromic complex and not as a single etiological disease.

Materials and methods

Case report

A 3,250 gm. male infant, product of a full term pregnancy, showed signs of fetal distress, due to which a

cesarean was performed. There were Apgar scores of 3 and 1 at 1 and 5 minutes of age, respectively, so reanimation procedures were carried out with admission into the Intensive Care Unit.

He remained in the Intensive Care Unit for 7 days with hypoglycaemia crises which were satisfactorily treated in the appropriate manner. Serum calcium level remained within normal limits all this time.

At 9 days some firmly consistent discrete nodular lesions appeared on the upper back and shoulders. After some days they merged, forming a large, red violaceous plate with normal skin covering (Fig. 1).

Results

A cutaneous biopsy of the lesion area was done and the dermis and epidermis showed no histological alterations. At the subcutaneous fat level a few fibroid tracts with necrotic areas appeared (Fig. 2), in which there were a large number of foreign bodies and multinucleated giant cells (Fig. 3). An abundance of needle-shaped crystals was observed in the cell cytoplasm (Fig. 4).

Discussion

Although the diagnosis of subcutaneous fat necrosis of newborn children does not involve great problems, this is not the case with its etiology.

Some authors have tried to explain the etiology of this entity by attributing it to fetal distress or obstetric trauma (De Vel and Bolin, 1929; Fox, 1933; Pasyk, 1978; Thomsen, 1980; Katz et al., 1984), hypothermia (Collins et al., 1953; Duhn et al., 1968; Silverman et al., 1986), maternal diabetes (Steiness, 1961), vascular anomalies with ischemia and a lack of brown fat (Taieb et al., 1986, 1987) or bad nutrition (Silverman et al., 1986), according to each case, but none of them have managed to throw light on a specific etiology.

We have to accept that this entity does not respond to a single etiology (Silverman et al., 1986) and thus

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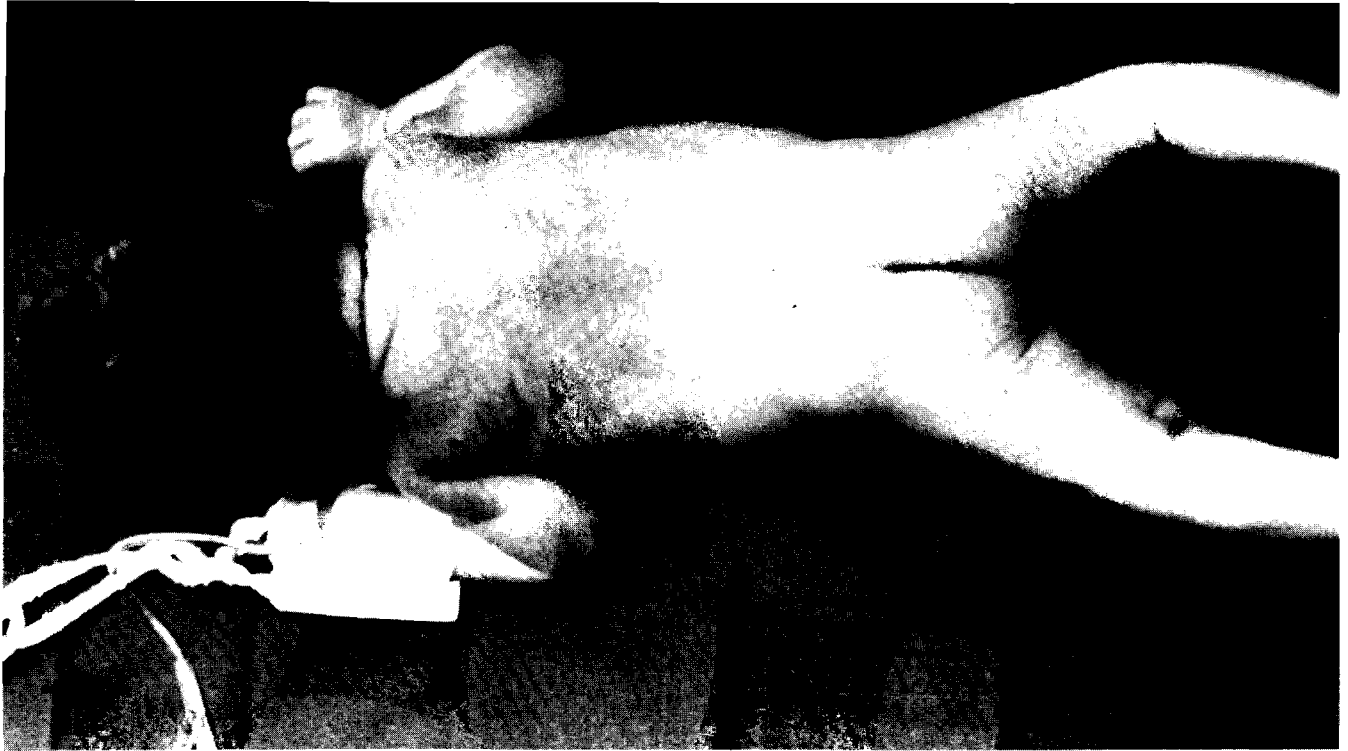


Fig. 1. A newborn male at 9 days of age with some firmly consistent discrete nodular lesions on the upper back and shoulders.

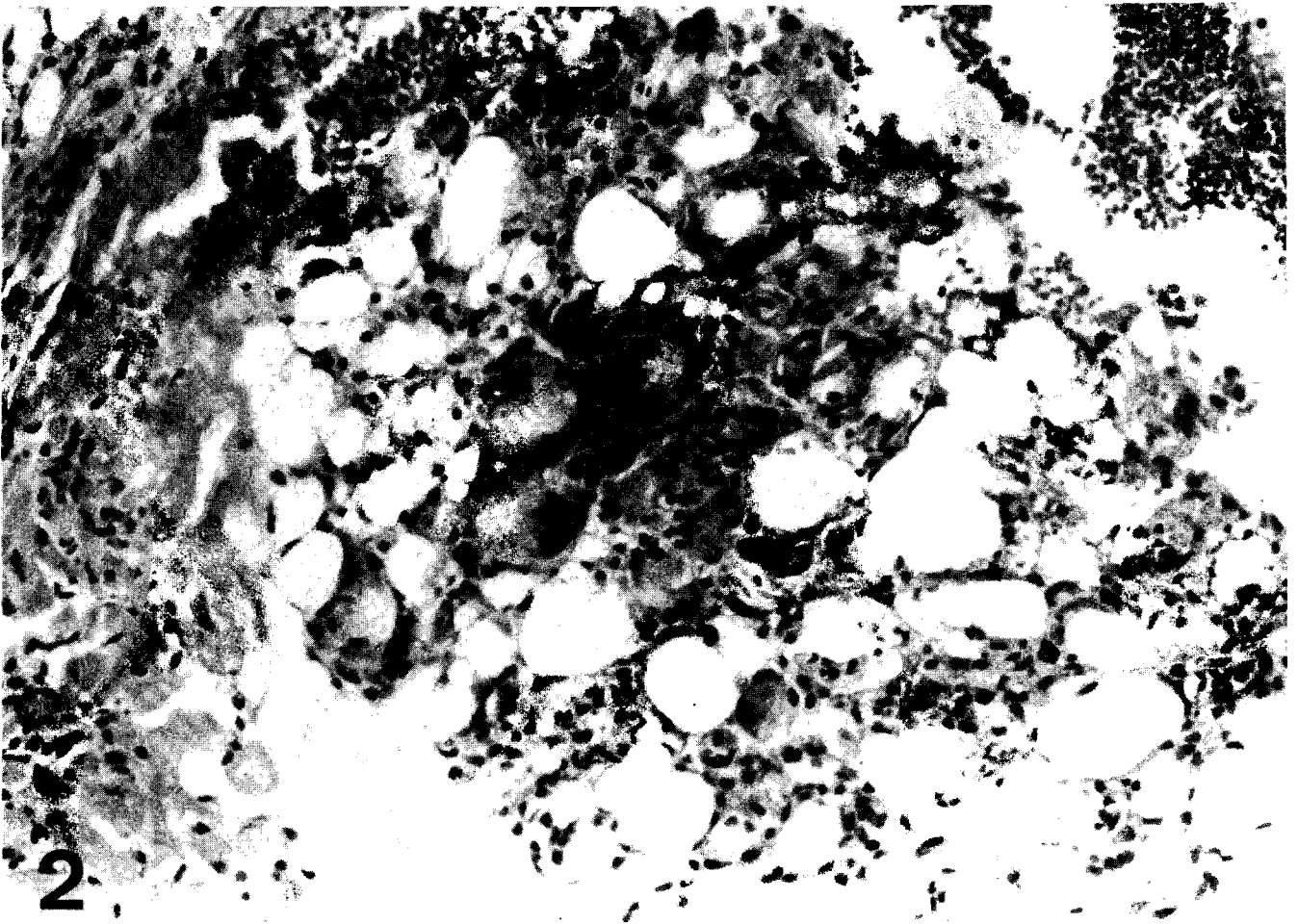


Fig. 2. Subcutaneous fat with necrotic areas, a few fibrotic tracts, lymphocytes and needle-shaped crystals. Hematoxylin-eosin stain. $\times 400$

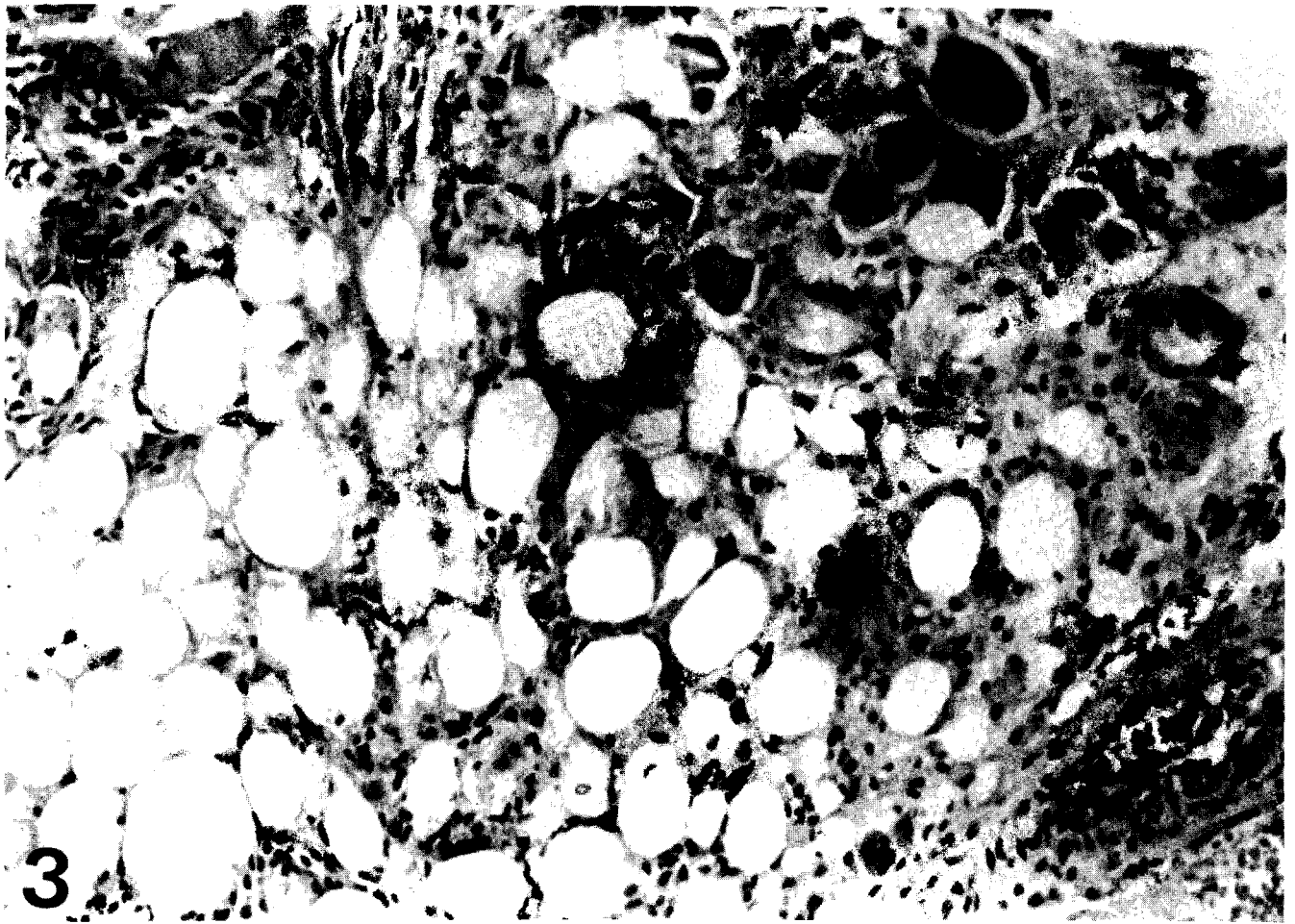


Fig. 3. Necrosis of adipose tissue with granulomatous reaction. Giant cells are prominent. Hematoxylin-eosin stain. $\times 400$

we can talk about some basic essential factors, without which the lesion could not occur, and other causative factors which could set off the disease.

We consider the essential factors to be: 1.- The existence of sufficient subcutaneous fat, in which the necrotic phenomena are produced; explaining why the lesion does not occur in prematurely newborn children (Taieb et al., 1987); 2.- The large amount of saturated adipose acids in the fat of children than in that of adults, which means that it has a higher fusion point (Channon and Harrison, 1926). These two factors are fully documented, with no discrepancies, in recently published material (Taieb et al., 1986, 1987; Norwood-Galloway et al., 1987).

Lately, Taieb et al. (1986, 1987) have tried to explain this lesion as an alteration in the brown fat level caused either by a lack of the fat or hypoxia in it.

We do not consider that a lack of brown fat in these children has been proved although, if it were so, this lack would be an added basic factor but never its sole etiology. On the other hand we consider it unlikely that a hypoxia condition would harm the brown fat as it is specially indicated in these situations (remember that it is the main

adipose component in hibernating animals) because of its much greater vascularization than that of white fat. It would be more feasible to suppose that brown fat hypoxia were caused by an alteration in the vegetative nervous system, as its metabolism depends directly on this system. Yet not all children with subcutaneous fat necrosis suffer alterations in their nervous system. On the contrary, many newborn babies showing fetal distress and neurological alterations do not develop subcutaneous fat necrosis. The only datum which could support this theory of brown fat is the distribution of the fat necrosis lesions, which are superimposed on the anatomical distribution of brown fat. However, the lesion is always observed at the level of subcutaneous white fat.

As far as the causative factors are concerned, there are many and probably not all of them have yet been discovered. But we believe that these factors increase their power when more than one is present in every case. In the case we report there was fetal distress with a cesarean birth and hypoglycaemia crises, though none of the other causative factors were present.

Figure 5 gives an outline of the causative factors, which will no doubt be enlarged in future reports, and their effect on the basic or essential factors. Future experi-

Subcutaneous fat necrosis



Fig. 4. Subcutaneous fat showing radical arrangement of needle-shaped crystals within fat cells. Hematoxylin-eosin stain. $\times 1,000$

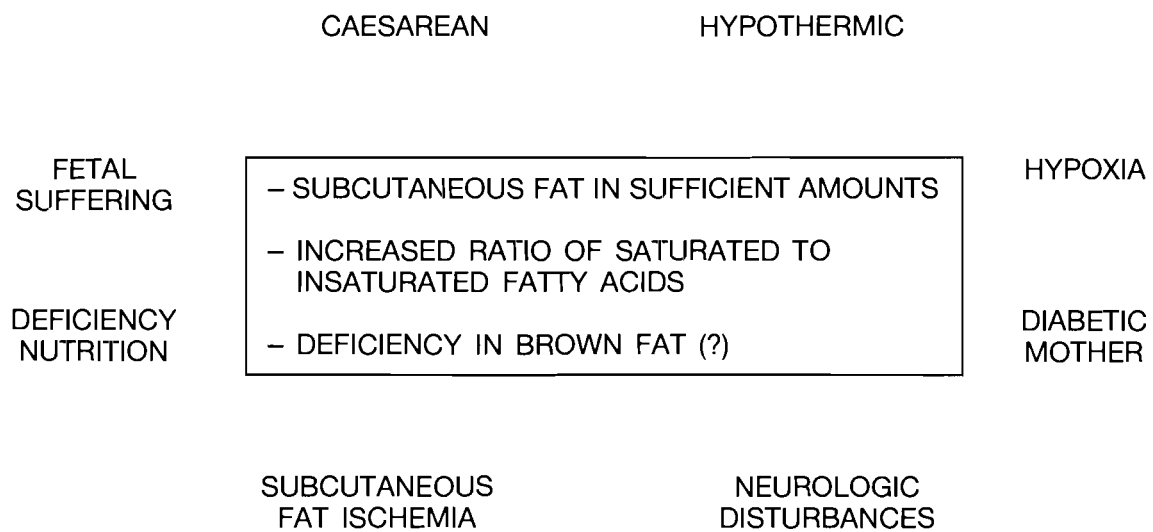


Fig. 5. Outline that explains the development of subcutaneous fat necrosis of newborn children with essential factors and causative factors.

ments must be directed towards discovering whether there really is any alteration at brown fat level or whether the characteristic distribution of this illness is only due to the larger amount of adipose tissue in that area.

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