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Case Report

Myxoid Liposarcoma

Light and Electron Microscopic Investigation*

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Summary. Liposarcoma is an important soft tissue sarcoma. It requires careful classification into types, since prognosis varies considerably with histological appearance. In this case a myxoid sarcoma is shown to contain cells resembling fetal fat with active pinocytosis, and some scanty signet-ring cells. Their ultrastructural appearances are described.

Key words: Liposarcoma — Sarcoma — Soft tissue tumors — Mesenchymal tumors.

The liposarcoma is an important and relatively common malignant tumor of the soft tissues. It must be differentiated from a variety of benign neoplasms and inflammatory conditions, e.g. fat necrosis, pseudosarcomatous fasciitis, lipoma, neurilemoma Antoni type B and especially myxoma (Gläser, 1974; Stout et al., 1966). The histologic appearance of liposarcoma in light microscopy shows a great variety of pictures, yet the majority imitate embryonal adipose tissue. In diagnosis an additional phrase should be added to indicate the type, because the biological behaviour varies with the degree of differentiation. Little is known about the ultrastructure and cytoplasmic differentiation of liposarcoma cells. In the present study a case of myxoid liposarcoma is analysed with the aim to provide information about the cellular differentiation and general ultrastructure of liposarcoma cells.

Case Report

A 26-year-old woman had a nodule in her left groin which had been present for 4 weeks prior to clinical investigation. The suspected diagnosis was inflammation of lymph nodules or inguinal hernia. The nodule was mobile at physical examination and it was painful to palpation. Local excision was admitted, the specimen proved to be a 6 to 4 cm circumscribed tumor of firm constitution, the cut surface was greyish-white and gloosy.

Histopathologic diagnosis (E.-Nr. 732/75) was "myxoid liposarcoma". There is no local recurrence or evidence of metastasis 14 months after surgical treatment. Radiation or chemical therapy was not given postoperative.

Light Microscopy

Histologically the tumor consists of small fat cells intermingled with a myxoid and conspicuous vascular stroma (Fig. 1). Fat cells show differentiation to fetal

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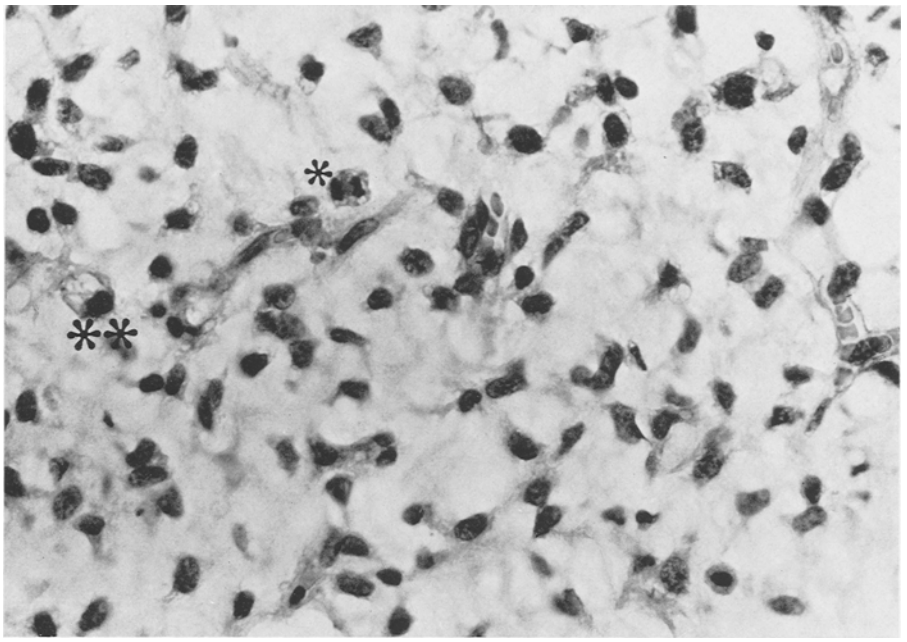

Fig. 1. Myxoid liposarcoma with moderate cellularity and a predominantly myxoid and vascular stroma; notice mitosis (*) and lipoblast (**); H & E, × 620

fat of common type and—in part closely packed together—imitate the appearance of brown fat. The typical cell of myxoid liposarcoma is small, stellate or spindle-shaped with an indefinite cytoplasmic boundary. The nucleus is small and sometimes rather pyknotic in appearance. The cytoplasm often is finely vacuolated by lipid droplets. The myxoid stroma is rich in capillaries but there is no blood vessel invasion visible. Mitotic figures are scanty. In myxoid liposarcoma adult signet-ring fat cells and immature lipoblasts are usually rare and never conspicuous, except for small foci.

Electron Microscopy

Two main types of tumor cells are visible: multivacuolar lipocytes and fibroblast-like cells with only a few lipid droplets. The smaller, closely packed droplets in lipocyts contain strongly osmiophilic substances apparently lipoproteins (Fig. 2). Larger droplets appear to be membrane-bound, and within these droplets various amounts of lipid debris and membran fragments are demonstrable. The nuclei are markedly flattened and margin-displaced and thus liposarcoma cells of this type in light microscopy mimic signet-ring cells (Fig. 3). Sometimes spindle-shaped cells are observed with bundles of intracytoplasmic fibrils and clusters of mitochondrias (Fig. 4). These cells also contain smaller lipid droplets and numerous pinocytic vesicles. Both types of liposarcoma cells show at the periphery free

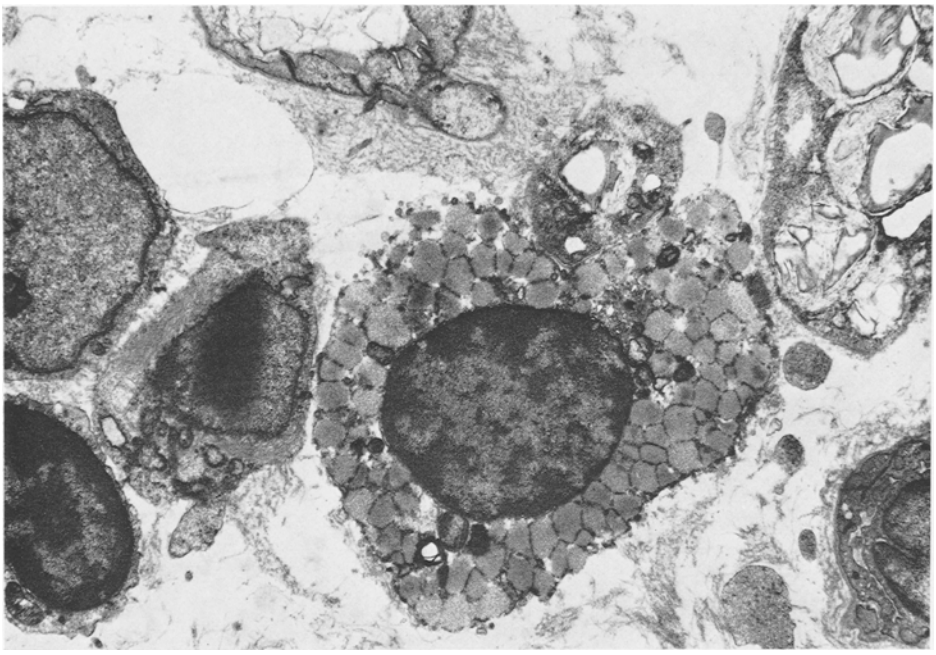

Fig. 2. Electron micrograph of multivacuolar lipoblast; strongly osmiophilic droplets are evident for lipoproteins ($\times$ 8,900)

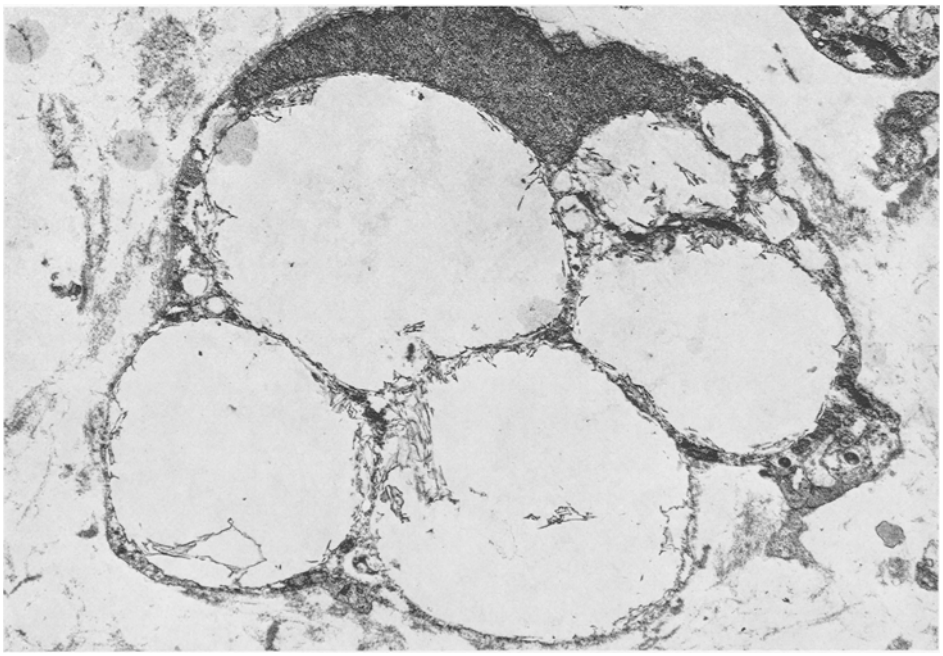

Fig. 3. Liposarcoma cell with flattened nucleus; membrane-bound droplets with membran fragments ($\times$ 8,500)

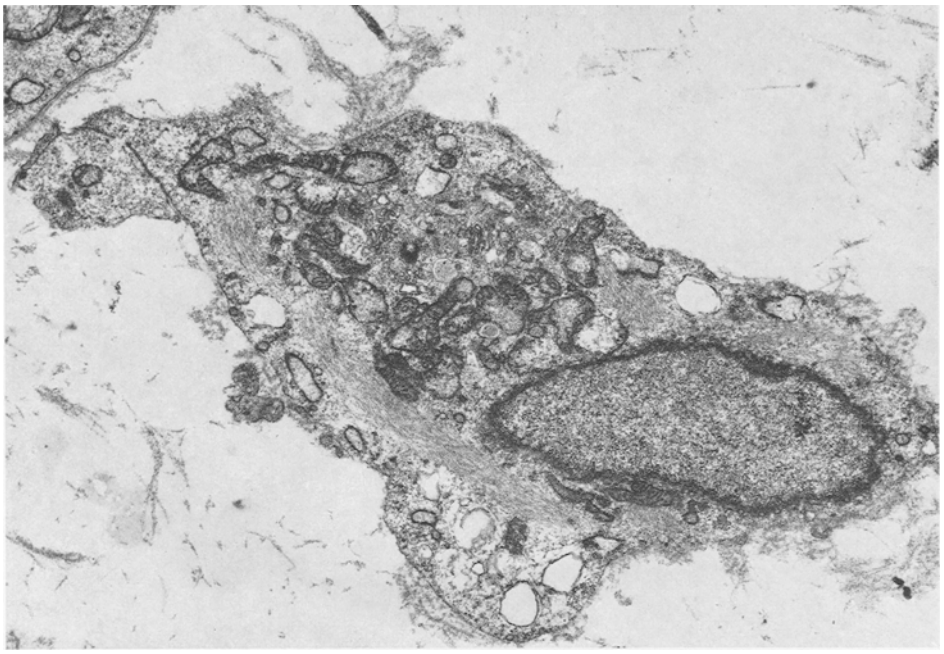

Fig. 4. Liposarcoma cell with clusters of mitochondrias and bundles of intracytoplasmic fibrils (× 22,800)

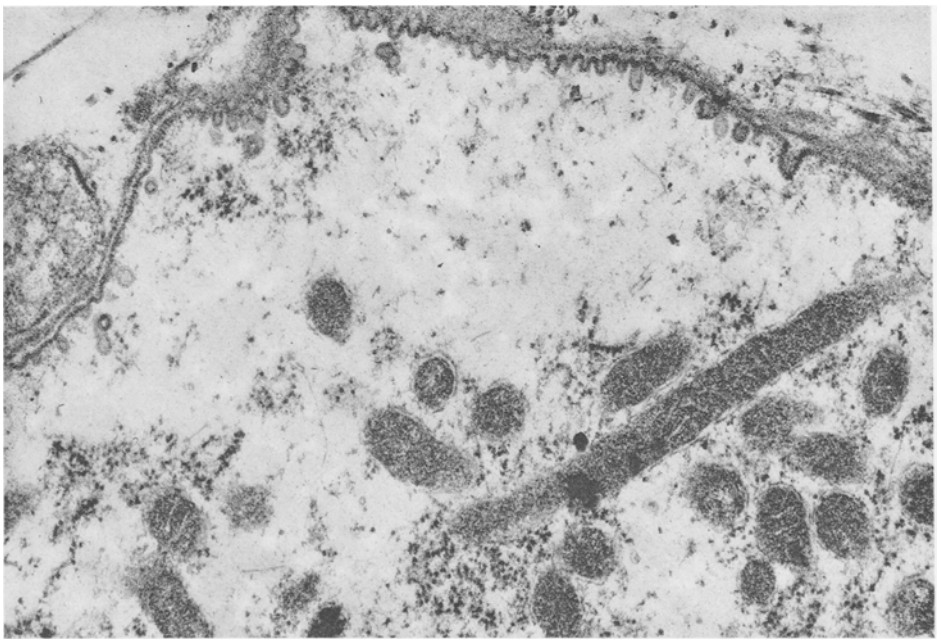

Fig. 5. Margin of sarcoma cell with micropinocytic activity (× 47,000)

ribosomes and micropinocytosis vesicles (Fig. 5). Cells are widely separated without intercellular cytoplasmic processes. The surrounding myxoid matrix shows fragments of fibrils and empty pericellular spaces.

Discussion

The majority of liposarcomas develop in the later years with a slight male predominance (mean age about 50 years; Stout and Lattes, 1966; Gläser, 1974). The rarity of liposarcoma in childhood is well recognized. Tumors arise in the deeper soft tissues, especially the lower extremities, the gluteal region and the retroperitoneum (Braund and Piggot, 1962; Thompson et al., 1971). The tumors are commonly moderate in size but large sarcomas about 20 cm in diameter have been recorded (Stout and Lattes, 1966). Many of the smaller liposarcomas are grossly circumscribed and slow growth is characteristic for the myxoid type.

Liposarcomas of different types show a great variety in cellular differentiation. Sarcomas of low grade malignancy suggest the appearance of brown fat (multivacuolar lipocyts), a less common variety consists of vacuolated rounded lipoblasts. Liposomes in brown adipose tissue are usually lined by a 70 to 80 Å membrane with close connection to endoplasmatic reticulum (Picard et al., 1966). As in this demonstrated case, micropinocytosis is a characteristic structure in fetal adipose tissue. The nonpleomorphic type of lipocyte or lipoblast is the predominant cell in myxoid liposarcoma. Adult fat cells are present in most cases but they are never conspicuous.

According to Stout (1944) and Enzinger et al. (1969) liposarcomas should be subtyped (1) predominantly well-differentiated, (2) predominantly myxoid (embryonal type), (3) predominantly round-cell, (4) predominantly pleomorphic (poorly differentiated), and (5) mixed type containing features of 1 to 4. As might be expected, liposarcomas that showed a low grade differentiation (group 3 to 4) had a 60–90% 5-year mortality as compared with 20–30% for those of group 1 and 2 (Gläser, 1974; Reszel et al., 1966).

Biological behaviour varies with the degree of differentiation; well-differentiated and myxoid types can recur unless widely and completely excised, whereas the poorly differentiated sarcomas (round-cell and pleomorphic) may metastasize in about 40% (Stout et al., 1966). Myxoid liposarcoma must be differentiated from myxoma and degenerative changes in collagen. There is no doubt that many of the cases diagnosed as myxoma or myxosarcoma are examples of myxoid liposarcoma (incidence of liposarcomas: 0.3–2% of soft tissue tumors in Germany as compared with 15–26% in USA; Gläser, 1974). Beyond the cellularity and conspicuous vascularity in these cases a lipid stain is indispensable.

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