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# Leiomyosarcoma of the breast with late dissemination

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**Summary.** A case of recurrent leiomyosarcoma of the breast is described with multiple metastases after 14 years without symptoms. It is suggested that leiomyomas of the breast containing as few as two mitoses per 10 HPF, or which reccur and contain any visible mitoses must be considered to be malignant.

**Key words:** Breast – Leiomyoma – Leiomyosarcoma – Metastases

## Introduction

Sarcomas constitute approximately 1% of all malignant breast tumors (Oberman 1965). Leiomyosarcoma is one of the rarest of the sarcomas, and only 6 well documented cases have been reported in the literature (Barnes and Pietruszka 1977; Chen et al. 1981; Crocer and Murad 1969; Hernandes 1978; Haagensen 1971; Pardo-Mindan et al. 1974) of which only one developed metastases. A case also investigated by immunohistological staining is presented.

## Case history

A 24 year old woman had a tumour of the right breast at the edge of the areola removed in 1960. In 1962 and 1965 the patient had recurring tumour at the same site excised. Biopsy of a new recurrence in 1966 showed leiomyosarcoma and the patient was subjected to simple right-sided mastectomy at the age of 30 years; there was no further tumor tissue in the breast specimen. The patient was free from symptoms for the following 14 years, but was re-admitted to hospital in 1979 at the age of 43 years. During this admission she was subjected to the removal of three cutaneous leiomyosarcomatous infiltrations from the scalp and one from right lung. The condition of the patient gradually deteriorated and death occurred in May 1980. Post mortem examination revealed no local recurrence and no metastases to the axillary or mediastinal lymph nodes, but metastases in the brain, thyroid gland, kidneys and skin.

## Pathology

Sections of the tumour removed in 1960 were not available, but according to the description it was small and had a microscopical appearance similar to that of the tumour removed in 1962. The latter consisted of a 1.5 cm large circular and withish tumour. Microscopic exami-

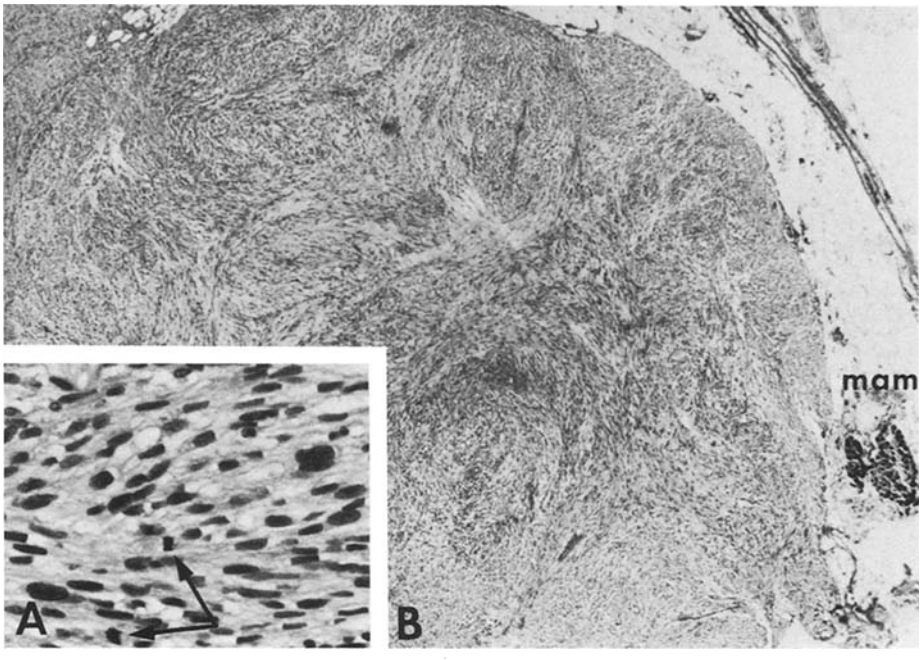


**Fig. 1 A, B.** A section showing the leiomyosarcoma with the surrounding breast tissue (*mam*). *Inset* (**A**) the elongated spindle-shaped tumour cells with blunt ended nuclei in a parallel arrangement and with sporatic mitosis (*arrows*). (HE, **A** × 400 and **B** × 25)

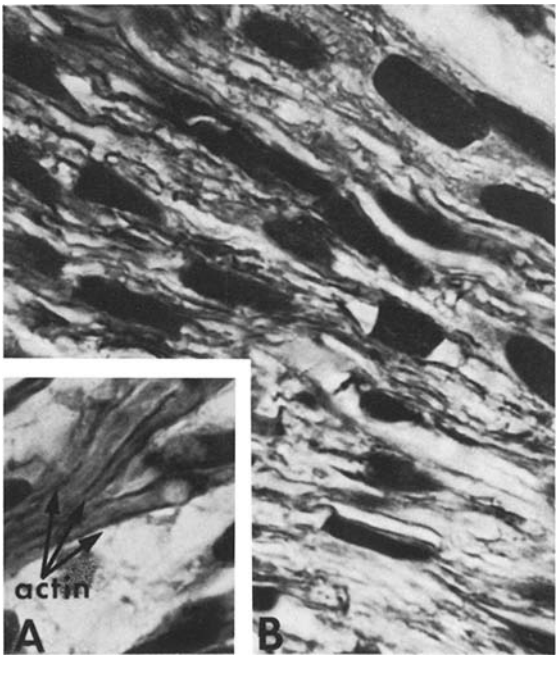


**Fig. 2. B** Nearly all the tumour cells shows cytoplasmatic positivity for actin. *Inset* **A** the actin positivity is principally located along the cell membrane (*arrows*). (Anti-actin-PAP procedure counterstained with Mayers haematoxylin. **A** × 1,000 and **B** × 400)

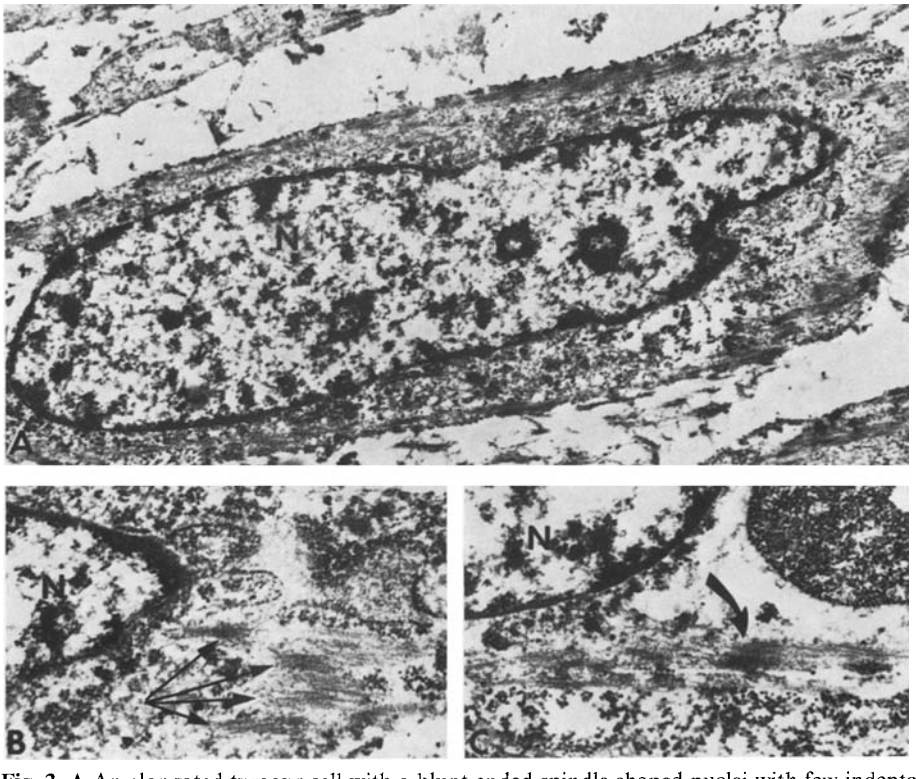


**Fig. 3.** **A** An elongated tumour cell with a blunt ended spindle shaped nuclei with few indentations is shown. **B** and **C** The cytoplasm contain parallel arranged actinlike filaments (*arrows*), of which some shows condensations (*thick arrow*). *N*, nucleus. (Zink uranyl acetate and lead citrate, **A** × 9,000 and **B** and **C** × 26,000)

nation showed a circumscript, but non-encapsulated tumour, which consisted of elongated cells with eosinophilic cytoplasm and blunt-ended spindle-shaped nuclei. The cells were arranged in interlacing fascicular bundles, in places showing a tendency to palisade formation of the nuclei. There was slight to moderate polymorphia of the nuclei and two mitoses per 10 HPF in the most active areas. Van Gieson, reticulin and PTAH staining showed no collagen fibrils, a fine reticulin net around the individual cells and the occurrence of cytoplasmic fibrils respectively. The tumour removed in 1965 was approximately 1 cm and had the same microscopical appearance as the earlier tumours, apart from an increased number of mitoses, 8/10 HPF in the most active areas.

The biopsy of the recurrence in 1966 contained a 2 cm diameter greyish and poorly circumscribed tumour, which microscopically could be seen to be partly in the lower half of the areola and partly in the underlying breast tissue (Fig. 1). It had, in places, an expanding border and a surrounding rim of lymphocytes. Some of the smooth muscle bundles of the nipple showed transition to tumour tissue. The histological picture was unchanged except for an increased number of mitoses, 14/10 HPF in the worst areas, some of these were abnormal (Fig. 1). Immunohistological staining for actin (ad modum Bussolati et al. 1980, titer 1:40) showed many of the tumour cells to be positive (Fig. 2). Electron microscopic examination of the paraffin embedded tissue showed tumour cells with a elongated and often indented nuclei (Fig. 3). The cytoplasm had numerous actin-like filaments both around the nucleus and peripherally (Fig. 3). The mitochondria were situated around the nucleus and a rudimenta-

ry granular endoplasmatic reticulum was observed, as well as condensed plaques along the cell membrane.

The tumours removed from the scalp were localized to the dermis, in some areas ulcerating the epidermis. They showed leiomyosarcoma infiltrations with a composition similar to that of the breast tumours, but with increased cellular and nuclear polymorphism. The metastases to the other organs were of identical histological appearance, and with up to 52 mitoses per 10 HPF.

## Discussion

Benign and malignant smooth muscle cell tumors of the breast are rare (Azzopardi 1979; Haagensen 1971). There have been only 6 reports of well documented cases of malignant smooth muscle cell tumors in the breast (Barnes and Pietruszka 1977; Chen et al. 1981; Crocer and Murad 1969; Hernandes 1978; Haagensen 1971; Pardo-Mindan et al. 1974). Other cases, the 4 cited by Hill and Stout (1973) and the two presented by Visfeldt and Scheike (1973) had no histological documentation, and the case of Cameron et al. (1974) was probably a malignant cytosarcoma phylloides (Chen et al. 1981). This case showed a pronounced tendency to recurrence and demonstrated a rising number of mitoses. As no example of a sarcoma developing from a leiomyoma have been documented (Nascimento et al. 1979) the tumour should be considered to be a primary leiomyosarcoma a conclusion which is also supported by the clinical course. The number of mitoses in the first tumour excised is unknown but the first recurrence of the tumour demonstrated 2 mitoses per 10 HPF. This can, when compared with the further course, provide the basis for the assumption that leiomyomas of the breast which recur and contains mitoses should be considered to be leiomyosarcomas. Nascimento et al. (1979) reported a recurring leiomyoma of the nipple without mitoses, in fact all the leiomyomas of the breast described to date have been without mitotic activity (Chen et al. 1981) with the exception of Webbers (1975) case. The lower limit of 3 mitoses per 10 HPF, as suggested by Chen et al. (1981) for a diagnosis of leiomyosarcoma can possibly be reduced to an abitrary 2/10 HPF. This limit should possibly be even lower, the mere presence of mitoses as the case of Chen et al. (1981) and our case, illustrate a necessity for long-term observation. The considerable uncertainty which is present with regard to the counting of mitoses (Ellis et al. 1981) should, however, be borne in mind.

Myoepithelia, blood vessels and nipple musculature have all been suggested as the origin of leiomyosarcomas of the breast (Hernandez 1978). In the present case the localization of the tumour and the observed transition between the tumour and the nipple musculature, suggests an origin from this site, as in the cases of Hernandez (1978) and Pardo-Mindan et al. (1974). There are no findings which favour an origin from myoepithelium or blood vessels.

The prognosis of breast sarcomas including leiomyosarcomas has been stated to be related to the number of mitoses, the grade of cellular polymorphism and the tumour border contour (Barnes and Pietruszka 1977). This

is different from leiomyosarcomas of the dermis where the number of mitoses are said to be unimportant (Fields and Helwig 1981).

Late tumour recurrence or dissemination is well-known in carcinoma of the breast (Haagensen 1971) and has also been described in malignant cystosarcoma phylloides (Donegan 1979). It is now further documented with regard to leiomyosarcoma of the breast (Chen et al. 1981). The cutaneous infiltrations in the present case could possibly be considered to be new primary tumors but the presence of simultaneous multiple infiltrations and their localization to the dermis with later pulmonary, cerebral and kidney metastases refute this theory (Fields and Helwig 1981).

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