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A Case of Stewart-Treves Syndrome

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Several months after left radical mastectomy without irradiation therapy for breast cancer, a 74-year-old woman developed severe edema on the homolateral arm extending to the axilla. Ten years later, purplish to brownish blotch and nodules accompanied with heating sensation and pain appeared and increased in size gradually on the left forearm.

The patient was treated by irradiation therapy under the clinical and histopathologic diagnosis of Stewart-Treves syndrome and almost all of the skin leisons and symptoms disappeared after irradiation of 6450 rads.

Key Words: *Stewart-Treves syndrome, Lymphedema, Angiosarcoma.*

INTRODUCTION

Angiosarcoma is an uncommon, aggressive neoplasm arising from the endothelium of vascular spaces (Woodward et al., 1972). Stewart-Treves syndrome is defined as a virulent angiosarcoma arising on a chronic lymphedematous arm after radical mastetomy, which was reported as a clinical entity by Stewart and Treves in 1948. The blue-red or purple, well-defined macular or papular lesions in the edmatous skin and subcutaneous tissues of a woman undertaken radical mastectomy herald the onset of malignancy and followed by visceral metastasis and death (Derbrow and Adair, 1961).

Angiosarcoma fell into six different clinical groups by anatomic distribution: scalp-face; postmastectomy (Stewart-Treves syndrome); postradiation; leg with vascular stasis; breast; and miscellaneous (Maddox and Evans, 1987).

The cases reported in Korean literature were the angiosarcomas which developed on the scalp and face in patients of old age (Jung et al., 1973; Oh et al., 1981; Cho et al., 1986; Lee et al., 1988). To the best of our knowledge, the Stewart-Treves syndrome has not been reported in Korea so far.

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CASE REPORT

A 74-year-old female underwent left radical mastectomy in May 1977 for carcinoma of the left breast. No postoperative radiotherapy was given and satisfactory wound healing was observed. Several months later a persistent, chronic lymphedema involving the entire left upper extremity appeared and got worse one year later. The patient did well until January 1987 when she noticed a purplish to brownish blotch and nodules on the flexor surface of the left forearm (Fig. 1A).

On physical examination of the patient, linear hypertrophic mastectomy scars were present. There was no evidence of local recurrence and no enlargement of the regional lymph node was present. The right breast was normal. The chronic lymphedema of the entire left upper extremity and purplish to brownish blotch and nodules on the left forearm were found.

A chest film showed no radiologic evidence of pulmorary metastases. Radiographs of the left forearm demonstrated no bone involvement. No abnormal

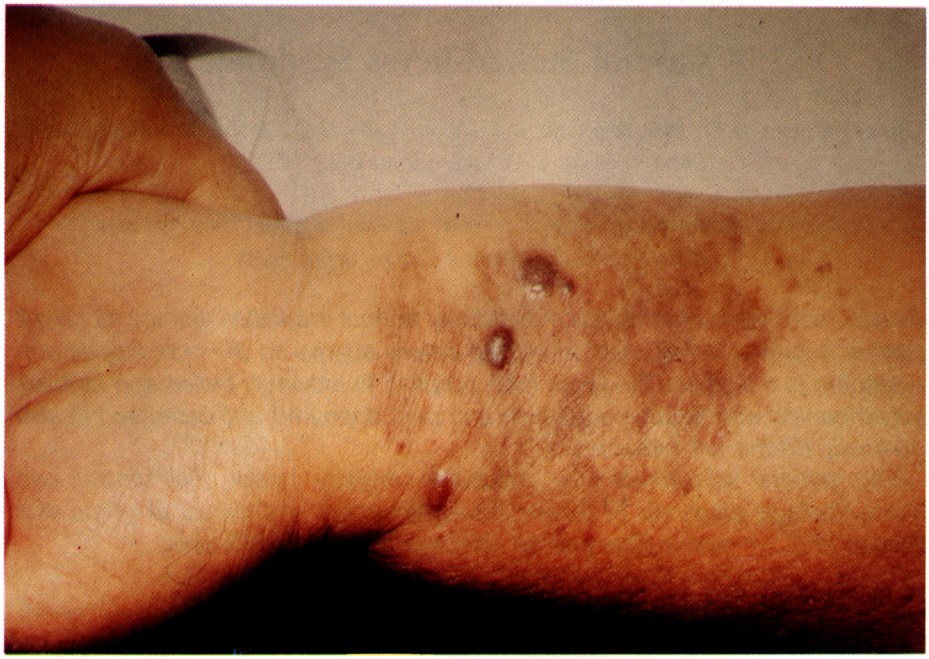

Fig. 1A. Purplish to brownish colored blotch and nodules on the left forearm.

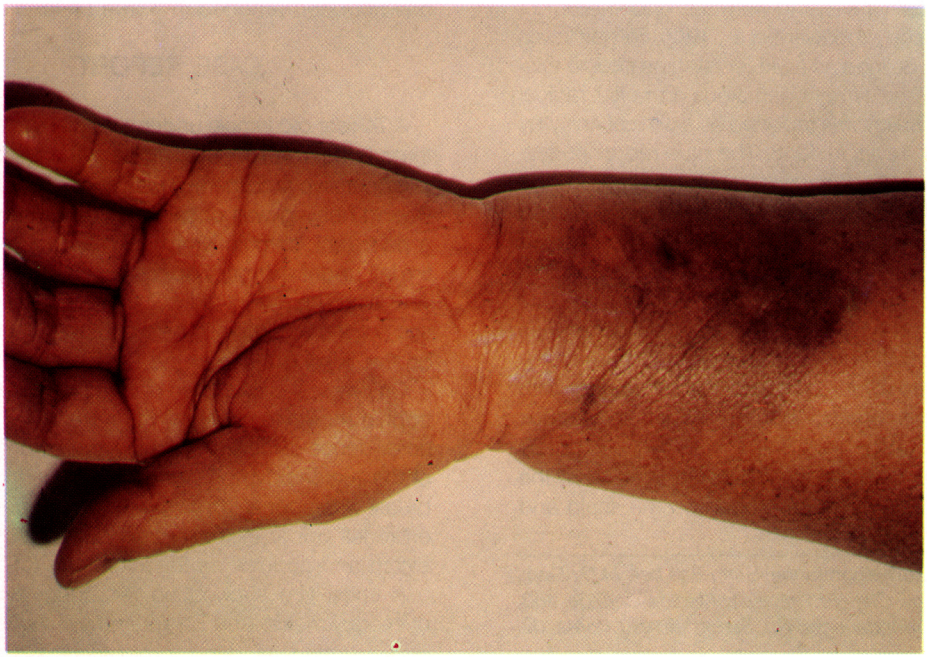

Fig. 1B. Six weeks after 6450 rads. Note the disappearance of nodules.

laboratory findings were found.

Histopathological observations obtained from the nodule at lower power showed the presence of one nodule located in the upper and middle dermis (Fig.2). The nodule exhibited the presence, in the tumor, of anastomosing vascular channels lined by atypical cells, some of which were filled with red blood cells (Fig. 3). At high magnification, the vascular channels were lined by large, plump endothelial cells protruding into the lurmina and filling the smaller vessels, cellular atypism usually was minimal, and mitotic figures were rare. Other important feature is a thin "Grenz zone" of uninvolved papillary dermis between the dermal tumor and the epidermis.

The reticulum stain demonstrated intense condensation of reticular fibers surrounding vascular lumina and individual tumor cells. Lobules of atypical endothelial cells were seen near or within poorly formed vascular spaces but always within the reticular framework (Fig. 4).

Considering of the patient's age, radiotherapy was recommended for the purpose of palliation. The patient received 31 treatments in six weeks for a total dose of 6450 rads to the skin lesions (200 250 rads/treatment) using X-ray and electronbeam. At the end of treatments, almost all of the skin lesions and symptoms disappeared and she is now followed regularly.

COMMENT

Since the original description of six cases of angiosarcoma associated with postmastectomy lymphedema by Stewart and Treves in 1948, almost 200 cases have been reported in the literature (Woodward et al., 1972; Schafler et al., 1979). Chronic lymphedema has been implicated as the most important factor in the etiology of angiosarcoma (DiSimone et al., 1970; Sordillo et al., 1981), although occasional reports of angiosarcoma arising in the non-edematous extremity have appeared (Liszauer and Ross, 1957; Salm, 1963; DiSimone et al., 1970). Angiosarcoma is probably the same entity as malignant angioendothelioma designated by Wilson-Jones (1964), lymphangiosarcoma by Reed et al. (1966), and hemangioendothelioma by Stout (1943).

The histogenesis of angiosarcomas, being obscure, has been the subject of sufficient speculation by other authors. But, it is now widely thought that the tumors arise from both lymph vessels and capillaries (Jessner et al., 1952; McConnell and Haslam, 1959; Wolff, 1963; Baes, 1967).

The causes of angiosarcoma of an extremity not associated with postmastectomy lymphedema include congenital lymphedema, surgery for axillary (with postop. radiation), filariasis, carcinoma of cervix(with

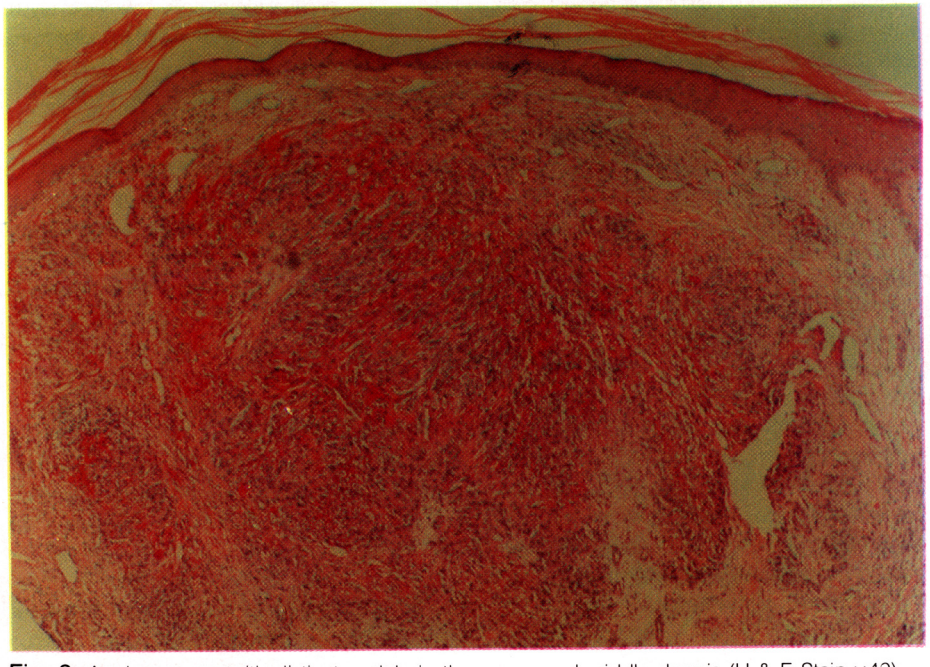

Fig. 2. Angiosarcoma with distinct nodule in the upper and middle dermis (H & E Stain.×40).

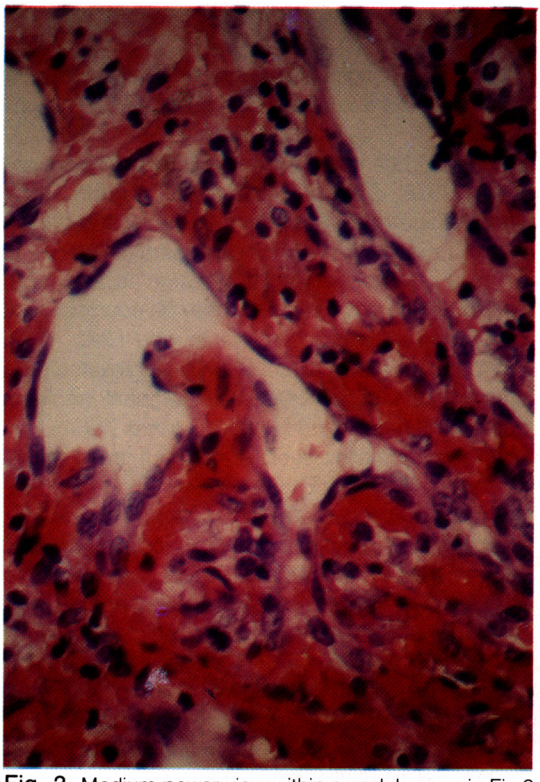

Fig. 3. Medium power view within a nodule seen in Fig.3 shows channels lined by plump endothelial cells and diffuse proliferation of atypical endothelial cells, formation of rudimentary and imperfect vascular space containing red blood cells, and some intraluminal projection. (H& E stain,×400).

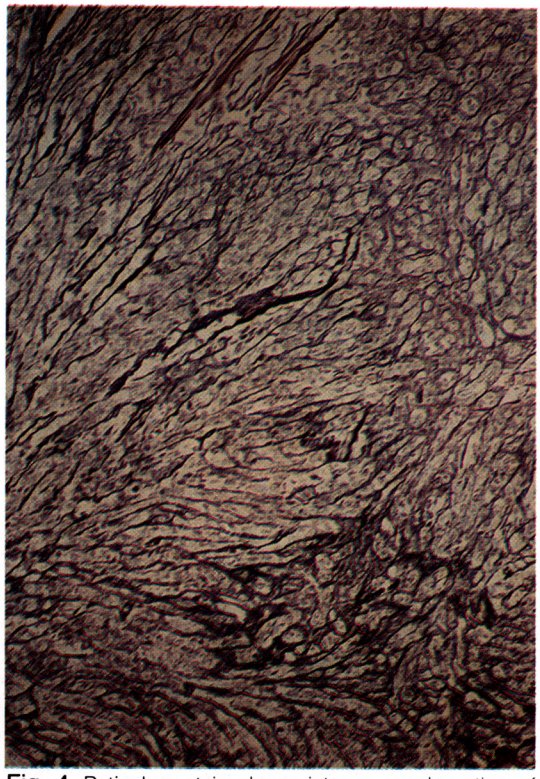

Fig. 4. Reticulum stain shows intense condensation of reticular fibers surrounding vascular lumina and individual tumor cells. Lobules of atypical endothelial cells were seen within reticular framework (H & E stain,×100).

postop. radiation), and fractured leg (Sordillo et al., 1981).

The distinguishing features are the bluish or purple color, somewhat reminiscent of a bruise or contusion, the frequent occurrence of a peripheral erythematous ring and of satellite nodules, the presence of small foci of intratumoral hemorrhage resembling blood blisters and the tendency for extensive local spread to occur, both superficially and deeply.

In most patients, lymphedema appeared within 1 year after mastectomy. Lymphedema of the arm was present from 5 to 25 years after radical mastectomy. The average interval from mastectomy to the appearance of angiosarcoma was 9 1/2 years (range 4 1/2 to 18 years) (Woodward et al., 1972). In our case, lymphedema appeared within several months after mastectomy and had been present for 10 years before angiosarcoma developed on her arm.

The incidence of post-mastectomy lymphangiosarcoma in women surviving at least five years after surgery has been estimated at 0.45 per cent (Caro and Bronstein, 1985). The average age of onset is approximatedly 60 years, and the tumor usually follows the mastectomy by an average of 10 years. The shortest time was 1 year, and the longest 26 years. Chronic lymphedema usually has been present an average of nine years prior to the onset of angiosarcoma.

Most frequently affected at first was the upper arm, then the forearm, the elbow, and anterior chest wall in order (Woodward et al., 1972; Maddox and Evans, 1987).

The tumor architecture varied considerably from area to area within the same neoplasm. Three main patterns of growth were recognized, to which the designations of angiomatous, spindle cell, and undif-

ferentiated were applied (Rosai et al., 1976). The anglomatous pattern such as showing in our case was characterized by the formation of dilated dermal channels of an obvious vascular nature. Anastomoses were frequent among them resulting in the formation of an intricate network, which dissected individual collagen fibers. The interstitium was often occupied by extravasated red blood cells, sometimes present in large numbers. One of the most striking characteristics of these vascular neoformations was their diffuse, apparently multicentric nature and their extension far beyond the gross boundaries of the tumor (Rosal et al., 1976). In the spindle cell areas the tumor cells did not form easily recognizable vascular channels. Instead they arranged themselves in more compact bundles that traversed the dermis in multiple directions, often wrapping around skin adnexa. The undifferentiated areas had much sharper borders than those previously described. They exhibited a solid pattern of growth, the tumor cells having a polygonal shape reminiscent of epithelial cells. The nuclei were large, hyperchromatic, with prominent nucleoli.

Various treatments have been tried. No mode of therapy produces a substantial cure rate, but some authors support the recommendation that angiosarcoma be treated where possible by radical surgical resection (DiSimons et al., 1970; Sordillo et al., 1981). Irradiation and chemotherapy have not been satisfactory. But, radiotherapy has been said to offer good palliation (Derbrow and Adair, 1961).

Radiotherapy was recommended as the initial treatment for our patient considering her age. The patient received 31 treatments in six weeks for a total dose of 6450 rads to the skin lesions (200-250 rads/treatment) using X-ray and electron beam. In our case, the response to radiotherapy was very satisfactory.

Yap et al. (1981) reported that local irradiation therapy was given to five patients who refused amputation. Among four of these patients received radiotherapy alone, one showed complete response and the others failed.

Many conditions to be considered in the histopathologic differential diagnosis include spindle cell squamous cell carcinoma, metastatic carcinoma, cutaneous hemangioma, pyogenc granuloma, vegetant intravascular hemangioendothelioma, Kaposi's sarcoma, dermatofibroma of the sclerosing hemangioma type.

In the present case, the diagnosis was supported by the characteristic clinical features as well as typical histopatholgic findings.

In 78 cases of known death from postmastectomy angiosarcoma, the mean survival time was ninteen months. The latent period for angiosarcoma appears to be one to twenty-six years after radical mastectomy (Eby et al, 1967). Patients subjected to amputation had a slightly better prognosis than those treated by radiation therapy (Woodward et al., 1972). The length of the time between radical mastectomy and the onset of angiosarcoma and the age of the patient did not affect the prognosis for the patient.

Angiosarcoma in non-postmastectomy lymphedema probabaly has a better prognosis. The mean (actuarial) survival of patients with angiosarcoma following mastectomy was 19 months, compared with 34 months for those developing the tumor in non-postmastectomy lymphedema (Woodward et al., 1972).

It is quite probable that local recurrence in this disease is really an expression of extensive multi-focal disease, a phenomenon that underscores the need to widely excise these tumors (Sordillo et al., 1981).

Metastases were found in the lungs, on the chest wall, and on the pleura (Woodward et al., 1972). Generally, widely disseminated metastases were found: however, isolated instances have been observed when massive involvement of the chest wall resulted in death without the expected dissemination of the sarcoma.

In our case, no disseminated metastates were found by roentgenogram and she has been followed 3 months without recurrence.

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