LYMPHANGIOSARCOMA FOLLOWING POST-MASTECTOMY LYMPHOEDEMA

BY

JOHN H. KETTLE, F.R.C.S., F.R.A.C.S.*Surgical Registrar, Royal North Shore Hospital of
Sydney, Australia*

[WITH SPECIAL PLATE]

Oedema of the arm has always been regarded as one of the most troublesome complications of radical mastectomy. It is not generally realized, however, that it can, if long continued, be complicated by the development of a lymphangiosarcoma, which has proved rapidly fatal in almost every case observed.

Lymphangiosarcoma occurring in a lymphoedematous arm was first described in 1948 by Stewart and Treves. These authors reported six cases, and since then single case reports have brought the total to not more than 20. Nevertheless, it is considered that this rarity is more apparent than real, and that many of these tumours go unrecognized or are misdiagnosed as recurrences of mammary carcinoma.

Onset and Course

The tumour has a characteristic appearance and develops in the skin of an arm affected by long-standing oedema. Awareness of the condition, the patient's history, and the physical findings enable one to make a firm clinical diagnosis. In all case reports there is a history of carcinoma of the breast which has been treated by radical mastectomy. Some patients have had in addition a course of deep x-ray therapy. All have developed a persistent oedema of the arm soon after treatment. The shortest interval between the onset of oedema and the appearance of the tumour has been five years, the longest 24 years.

The first sign of the disease is the appearance of a dark reddish-purple nodule usually in the skin of the upper arm, though occasionally of the forearm. As this enlarges, other nodules arise around it with a tendency to centrifugal spread. Many of them fuse so that a patchy discoloration develops. The affected areas feel thickened, rubbery, and may be tender. Ulceration sometimes occurs, and the larger lesions may become cystic. On section of the tumour the discoloration is shown to be confined to the surface. The nodules lead to great thickening of the skin, and some of them may show areas of haemorrhage, necrosis, or cyst formation. Growth extends into the subcutaneous tissue and later involves the deep veins. Ultimately distant metastases, usually pulmonary, bring about the patient's death.

Histology

The histological appearance varies, so that many stages in the malignant process may be observed in the one section. The dominant pattern is a proliferation of lymphatic vessels, some lined with apparently normal cells, others with definitely neoplastic cells. In parts are seen circumscribed masses of undifferentiated cells. The changes are most marked in the corium and subcutaneous tissue, and the tendency is for the process to spread by involving the larger lymphatics accompanying the veins. Actual invasion of the veins is common and accounts for the frequency of embolic pulmonary metastases.

Relationship with Oedema

The nature of the relationship between the prolonged oedema and aetiology of the tumour is discussed by Stewart and Treves (1948), who postulate a circulating carcinogen

capable of acting on tissues already modified by a pathological process. It is of interest to note that one of their patients who had undergone left radical mastectomy for carcinoma of the breast subsequently had a similar operation performed on the right side for a benign lesion, with development of lymphoedema and later lymphangiosarcoma on the right side. McCarthy and Pack (1950) draw attention to the similarity in gross and histological appearance between lymphangiosarcoma and Kaposi's disease, which is a sarcoma arising from blood vessels usually in the lower limbs and having a racial predilection for Jews and Italians.

Treatment

In treatment both surgery and irradiation have been employed. Neither has met with conspicuous success. Clearly the case reports are too few to allow of any definite conclusions about the merits of a particular method of treatment. General opinion favours early radical surgery, preferably interscapulo-thoracic amputation. However, the sole reported five-year survival was treated with deep x-ray therapy only, and it would seem that this method should be given priority unless the oedema is already the cause of extreme disability (Southwick and Slaughter, 1955). The best result with surgery has been achieved by McCarthy and Pack (quoted by Marshall, 1955), with a survival of three years and five months following interscapulo-thoracic amputation. In most other cases, treated with either irradiation or surgery, or both, death has occurred within twelve months.

Case Report

In November, 1946, at the age of 63, a woman had had a radical mastectomy for carcinoma situated in the upper outer quadrant of the right breast. Microscopically the tumour had the structure of carcinoma simplex, and no metastases were found in the lymph nodes. The wound was slow to heal and required skin-grafting. On February 25, 1947, a course of deep x-ray therapy to the right supraclavicular and axillary areas was begun, and very soon thereafter the whole of the right arm became moderately oedematous. The oedema persisted with little change until about July, 1955, when it became more marked coincident with the appearance of a reddish-purple nodule in the skin of the antero-medial aspect of the right upper arm. The nodule gradually increased in size and others developed in satellite fashion, the more centrally situated of these becoming confluent.

Clinical photograph showing the gross appearance of lymphangiosarcoma

On January 22, 1956, the patient was admitted to hospital with a provisional diagnosis of recurrent mammary carcinoma. Examination revealed oedema of the right arm extending to the hand, and marked scarring and telangiectasis of the right pectoral region and axilla, the result of deep x-ray therapy. On the antero-medial aspect of the right arm was a patchy discoloration affecting an area 7 by 5 cm. and made up of multiple dark nodules slightly elevated above skin level and varying in size (see photograph). Ulceration had not occurred and there was no tenderness. There was no clinical or x-ray evidence of metastases elsewhere. Being made aware of the possibility of lymphangiosarcoma presenting in this way by Dr. George Pack, of New York, who was visiting the hospital at the time, we were able to make a pre-operative diagnosis which was confirmed by biopsy.

From previous reports of this condition then available to us it seemed that radical surgery offered the best chance of survival. Interscapulo-thoracic amputation was therefore advised, but the patient would not agree to this. Local excision was performed on February 7, 1956, an oval of skin 15 by 9 cm. being removed together with the underlying fat and deep fascia. Closure of the wound was effected with the aid of a split skin graft, and healing proceeded satisfactorily.

Further examination of the excised tissue revealed that the skin was three to four times the normal thickness and that the discoloration was confined to the surface. Microscopical study showed that the thickening of the skin was due to an increase in the width of the corium. In this, and to a less extent in the upper subcutaneous tissue, neoplastic cells were scattered either singly or in groups of a few cells (Special Plate, Fig. 1), but sometimes as small masses (Plate, Fig. 2). Frequently these cells were lining spaces and channels. Some of the channels, especially those in close proximity to blood vessels, gave the impression that the lining of pre-existing lymphatics had become neoplastic; in other places they occurred as a seemingly purposeless network of vessels. Both the growth pattern and appearance of the cells were quite different from those of the original carcinoma of the breast, and were consistent with a diagnosis of lymphangiosarcoma occurring in post-mastectomy lymphoedema of the arm.

On April 1 the patient was readmitted with further nodules appearing at the lateral margin of the graft. Amputation was reconsidered, but again the patient was not agreeable. Accordingly a course of deep x-ray therapy was started, the final treatment being given on July 5. This led to a marked regression in the growth of the local recurrence, but, unfortunately, when the patient was last seen on July 9 nodules were detected in the area of old post-irradiation scarring in the right axilla. It was generally felt that this development must destroy any hope of controlling the tumour with irradiation. Nevertheless an attempt will be made to treat these metastases, there being at present no evidence of more distant spread.

Comment

The history and findings in this case are in accord with those previously described as occurring in lymphangiosarcoma following post-mastectomy lymphoedema. The natural history of this disease distinguishes it from other varieties of angiosarcomata. Of special interest is its association with lymphoedema in a patient who has previously been treated for carcinoma of the breast, though the nature of this relationship is obscure.

The risk of such a tumour developing is greatest in those who have survived radical mastectomy by at least five years and who may thus be regarded as having a very good chance of cure of their mammary carcinoma. The frequency of lymphangiosarcoma in this group is unknown, but its recognition as a possible fatal complication emphasizes the importance of the prevention and treatment of the swollen arm.

Summary

Lymphangiosarcoma has recently been recognized as a complication of post-mastectomy lymphoedema. Unless there is awareness of the condition it is likely to be confused with recurrent carcinoma of the breast. The characteristic features of the tumour are described and illustrated by a case report. It is hoped that appreciation of this new hazard to those who have survived a mammary carcinoma will stimulate further studies in the prevention and treatment of post-mastectomy lymphoedema.

I am indebted to Mr. Eric Langley for permission to publish this case. I wish to thank Dr. Colin Graham, who reported on the sections, and Dr. P. Corlette, of Sydney Hospital, who supervised the patient's radiotherapy.

REFERENCES

- Marshall, J. F. (1955). *Ann. Surg.*, 142, 871.
McCarthy, W. D., and Pack, G. T. (1950). *Surg. Gynec. Obstet.*, 91, 465.
Southwick, H. W., and Slaughter, D. P. (1955). *Cancer*, 8, 158.
Stewart, F. W., and Treves, N. (1948). *Ibid.*, 1, 64.

NATURAL HISTORY OF OBSESSIONAL STATES

A STUDY OF 150 CASES

BY

JOHN POLLITT, M.B., M.R.C.P., D.P.M.

Senior Registrar, Department of Psychological Medicine,
St. Thomas's Hospital, London; formerly Registrar,
Department of Psychiatry, St. George's Hospital, London

(From the Department of Psychiatry, St. George's Hospital, London)

The literature on obsessional states is mainly concerned with psychopathology and treatment by psychotherapy. Curran (1952) drew attention to an ignorance of the "natural history" of these illnesses. After pointing out that with increasing age a decreasing number of these patients were, in his experience, referred for a psychiatric opinion, he continues: "What happens to severe obsessional states as they get older? I have asked a number of experienced psychiatrists, and after humming and hawing they have, in the end, come clean and confessed that they did not know."

It has been possible to find only three follow-up studies based upon reasonably extensive material—namely, those carried out by Lewis (1936), Müller (1953), and Rüdin (1953). Rüdin has contributed a study of 130 cases, referring to the natural history, but places particular emphasis on the hereditary relationships of the illness. Lewis and Müller reported the progress of 50 and 57 patients respectively after discharge from hospital. These writings constitute the only follow-up studies based on reasonably large series of cases, and reports on the obsessional state from its onset have not been found.

Further, the information available in current textbooks on the course of obsessional states is often meagre and a striking pessimism may be noted. For example, Cecil and Loeb (1955) limit their observations on the outcome of the obsessional states to the sentence: "The prognosis of the obsessional state is poor." The present study is an attempt to provide fuller information on the natural history of the obsessional illness as a whole.

W. DRUKKER *ET AL.*: HYPERPLASIA OF ADRENAL MEDULLA

FIG. 1.—Left adrenal, removed September, 1953. Hyperplasia of medulla with elongations between cortex.

FIG. 2.—Right adrenal, removed February, 1956. Very marked hypertrophy of adrenal medulla.

D. M. DOUGLAS: MITRAL REGURGITATION

Antero-posterior and oblique views of the heart. A, Case 1; B, Case 2; C, Case 3.

J. H. KETTLE: POST-MASTECTOMY LYMPHANGIOSARCOMA

FIG. 1.—Lymph channels lined by neoplastic cells; also neoplastic cells occurring singly and in small groups. ($\times 120$.)

FIG. 2.—Neoplastic cells occurring in masses. ($\times 120$.)