

SQUAMOUS CELL CARCINOMA APPEARING IN X-RAY-TREATED MYCOSIS FUNGOIDES

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Abstract. Two patients with mycosis fungoides developed a squamous cell carcinoma of the skin on the neck. Upon verification by routine biopsy testing of material taken from a suppurating infiltrate of the neck, both patients were treated intermittently with X-rays. Both had developed the squamous cell carcinoma on a sun-exposed area. Patient 1 had been treated with Grenz-ray irradiation totaling 10 kilovolt (kV) 4400 rad. and Dermopan step IV (50 kV) 5200 rad.; while patient 2 received altogether: Grenz-rays 4600 rad., Dermopan step IV 4000 rad., and soft X-rays (150 kV) 800 r. The latency period was, respectively, 3 and 10 years.

Key words: Mycosis fungoides; Squamous cell carcinoma; X-ray-induced cancer

From 1966 until mid-1975, the Norwegian Cancer Research Register has received reports of a total of 42 patients (29 males and 13 females) with clinically and histologically confirmed diagnoses of mycosis fungoides (m.f.). In addition there were 23 patients (17 men and 6 women) for whom the diagnosis was uncertain.

The Department of Dermatology, Rikshospitalet, Oslo, recently had 2 patients with m.f., and with squamous cell carcinoma in the neck region. Not having encountered this combination previously, nor having had any reports on cases of skin cancer in the m.f. patients entered in the Cancer Register during the last 10 years, we thought it of interest to publish this report.

CASE HISTORY

Case 1. A 62-year-old man, foreman in a rubber factory, had since 1965 developed an itching, eczematous, slightly desquamative rash on the back of the neck, the shoulders, the lower part of the trunk and on the extremities. At first the condition was interpreted to be an allergic contact exzema. The patch test showed a reaction to aminoazotoluol. During the first years the rash varied in intensity and extent. The patient was treated with local

steroids, with a certain transient effect. Little by little, infiltrates were formed on the affected areas, and in 1973 the diagnosis m.f. was made both clinically and histologically. Subsequently, he was treated intermittently with Grenz-rays and Dermopan step IV, altogether receiving 13 200 rad. A routine biopsy check taken from a suppurating infiltrate on the left side of the neck in February, 1976, showed, in addition to m.f., a surprising development of a small squamous cell carcinoma from epidermis at the edge of the erosion. No indications of metastases or multiple carcinomata have been established, clinically. X-ray of thorax and routine blood tests which have been taken regularly have been normal, with the exception of a slightly elevated ESR.

Case 2. A 60-year-old clerk, since 1963 suffering from an itching, papulous rash on the upper part of the shoulders, the extensor sides of the upper extremities, the gluteal region and the lower extremities. In 1966 the rash altered and developed into more spotted, erythematous areas which slowly became infiltrated and the diagnosis



Fig. 1. Suppurating mycosis fungoides infiltrate from patient 1. Note the suture where the biopsy was taken which revealed squamous cell carcinoma. A biopsy was taken from a similar lesion on patient 2.



Fig. 2. An early stage of a squamous cell carcinoma developing at the border of an erosion (left). Note that the epidermis at the surface is regular. The origin of the carcinoma may be a hair follicle. The heavy lymphocyte infiltrate in the dermis illustrates that the biopsy is taken from a mycosis fungoides plaque. $\times 64$.

m.f. was confirmed both clinically and histologically. Subsequently he was treated intermittently with Grenz-rays and Dermopan step IV, receiving 13 600 rad in all. A routine biopsy sample, taken from thick, suppurating infiltrate on the back of the neck in January 1976, showed atypical squamous cell hyperplasia in a hair follicle, possibly with an incipient development of invasive carcinoma. Clinically there have been no signs of metastases or multiple carcinomata. Routine X-ray of the thorax and blood tests have been normal, with the exception of eosinophilia (about 50%) in peripheral blood, slightly reduced total protein and albumin, and slightly elevated ESR.

DISCUSSION

Cancer caused by ionising radiation of the human body has been known as far back as 1902, when Friebe (1) described squamous cell carcinoma de-

velopment after regular X-ray treatment continued over a period of many years. Radiation-induced skin cancer has a tendency to ulcerate, and also develops more often after fractionated X-ray treatment than after a single application (1). Radiation-induced cancer develops more frequently on parts of the skin exposed to sunlight, such as the face, neck and back of the hands.

Both patients reported developed the squamous cell carcinoma on a sun-exposed area (4). Patient 1 had been treated intermittently with Grenz-rays on the neck (10 kilovolt (kV) in fractionated doses 200 rad. $\times 3-4$, totalling 4 400 r., and Dermopan step IV (50 kV) in divided doses 200 r. $\times 3-4$, a total of 5 200 r. Patient 2 had received Grenz-rays in divided doses (10 kV) 150-200 r. $\times 3-4$, totalling 4 600 r., Dermopan step IV (50 kV) 200 r. $\times 4$, a total of 4 000 r., and ordinary soft X-rays (150 kV, 5 mm aluminium filter) 200 r. $\times 4$, a total of 800 r. In both cases the treatment may be considered potentially cancerogenous.

Several authors (1, 2, 3, 4) have observed a latency period from radiation in the development of cancer varying from 1-2 years up to 64 years, with an average latency interval of 12-21 years. For our patients the latency period from the first irradiation of the neck to the development of cancer took respectively 3 and 10 years. Ten years seems reasonable, whereas 3 might be considered rather short. Still, it may be acceptable, assuming that the X-ray treatment may have stimulated previous actinic damage. Neither of the patients had a profession which predisposed to other carcinogenous factors, neither of them had practised exaggerated sun-bathing, nor had they previously taken arsenic-contain-

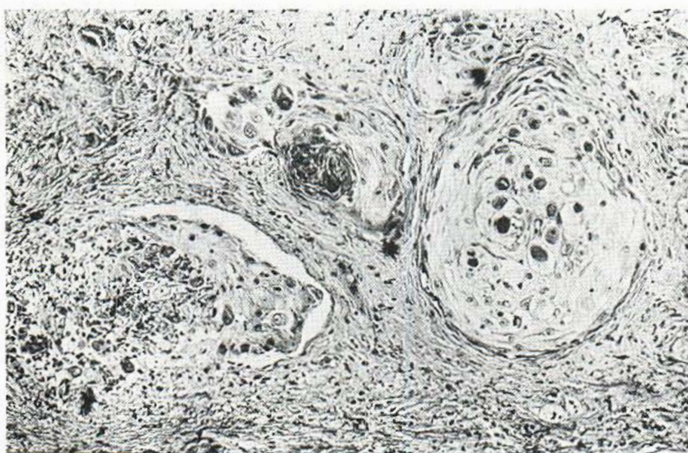


Fig. 3. Islands of atypical, squamous epithelium with one small horn pearl located in the middle of the dermis, the epidermis at the surface being normal (not illustrated). Apparently a squamous cell carcinoma. The origin may be a hair follicle. $\times 215$.

ing medication. Both tumours may have originated in hair follicles. Patient 2 had shown unspecific folliculitis in earlier biopsies. Neither patient has shown signs of alopecia mucinosa.

In both the available literature and in personal reports we have found no references to squamous cell carcinoma as a complication of m.f., despite the fact that these patients are to a great extent predisposed to the development of radiation-induced carcinoma. Several explanations for this can be given. For instance, the fact that radiation-induced cancer often appears as an ulcer and thus may be misinterpreted as an ulcerated m.f.-tumour. Both patients had wide spread multiple suppurating infiltrates, and it was by mere accident that the carcinoma was discovered on the neck. Another explanation for the fact that cancer is seldom discovered in such patients may lie in slow growth, and late and rare metastases, so that this cancer is only very seldom discovered by autopsy.

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