

X-Ray Treatment of Plantar Warts and the Development of Skin Carcinoma

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Sir,

X-ray treatment was used as a standard treatment for plantar warts from the 1930s to the late 1970s (1). The quality and quantity of radiotherapy varied a great deal, but the principle was mostly the same. Patients were given from a single dose to multiple doses of radiation and often the X-ray treatment was combined with other kinds of treatments, such as dressings containing salicylic acid. Treatment with Grenz rays was also tried instead of ordinary X-rays (2). The overall results from the different treatments were the same.

Two previous studies have investigated the adverse effects of radiotherapy, such as radio-dermatitis and ulcerations (2, 3). Shair et al. (2) found no ulcerations, but only minor skin changes such as hypo- and hyperpigmentation, atrophy, redness and hyperkeratosis (chronic radio-dermatitis) in about 9% of the areas treated. Veien et al. (3) found similar results and the authors therefore concluded that radiation therapy was a safe and effective method of treating plantar warts.

X-ray and Grenz ray therapy has also been used for many years in the treatment of other dermatological diseases. Studies have shown the same minor skin changes as seen after treatment of plantar warts, but in addition malignant transformations have been observed (4–7). In one review (4), 2 cases of squamous cell carcinoma (SCC) were discovered after X-ray treatment of eczema. They initiated with radio-dermatitis, soon progressing to chronic ulcerations with SCC. Malignant melanoma has also been reported to develop following X-ray therapy (5). Grenz ray-related skin cancer was first reported by Kalz in 1959 and others have followed (6, 7). In one case a young woman was treated with Grenz rays for her psoriasis after which she developed radio-dermatitis and SCC (7). She had received a total dose of only 3000 R, whereas previous Grenz ray-induced skin cancers had received a much higher dosage.

CASE REPORT

A 75-year-old woman was referred to the Wound Healing Center by a podiatrist because of a chronic plantar ulcer on her left foot that would not heal by conventional treatment. The ulcer measured 5 mm and was extremely painful. It had been present for about one year at the time of the referral. A biopsy showed atypical cells, suggesting SCC. The ulcer was then radically excised and the histology confirmed the diagnosis. The epidermis showed

acanthosis, hyperkeratosis, central ulceration and focal dysplasia. Furthermore, there was stromal invasion with atypical cells. After the excision the ulcer healed successfully. The patient has been checked regularly for one year after the operation, showing no signs of recurrence.

The patient had been treated with radiotherapy for plantar warts in that exact same spot on her left foot back in the late 1940s. The radiation was given through a filter specific for treatment of the skin. The exact dosage used in this specific case is unknown, since no case records have been kept. The known standard dosage used at that time was a single treatment with 3000 R, 35 kV. The treatment was repeated after a couple of months in this case since the wart did not disappear after the first treatment. This cured the wart and the patient had no symptoms until 40 years later, where increasing scar tissue and pain in the radiated area forced her to see a podiatrist regularly. After another 10 years the painful ulcer developed.

DISCUSSION

For many years radiotherapy has been considered a safe and effective type of treatment for plantar warts. Within the last couple of years possible evidence of radiation-induced skin cancer following this treatment has been described in patients with chronic plantar ulcers. In this case a plantar ulcer diagnosed with SCC developed more than 50 years after radiotherapy. In the earlier studies (2, 3) the patients were followed up to 28 years after the treatment. This raises the question as to whether the follow-up periods were too short for the malignancy to develop? And furthermore why did the malignant transformation develop so many years after radiation treatment of plantar warts, when it occurs so much earlier after radiotherapy of other benign dermatoses? Veien et al. (3) found it unlikely that any malignant transformation could occur due to the small-sized area of radiation and maybe this is one of the reasons for the delayed development. Another hypothesis could be that the malignant development is prolonged because of the thickness of the skin in the treated area. One should also consider whether infection with human papilloma virus (HPV) represents a co-factor, but since HPV in plantar warts has no known carcinogenic effect, it is unlikely to be of significance. The most important factor we have to consider is probably the given type and dose of radiation. Our patient received 2 treatments, while it was common in these days to give only a single treatment.

According to recent guidelines, radiotherapy no longer has a place in the treatment of cutaneous warts (8). However, some colleagues still commit to this type of treatment, giving a single dose of 3000 R, 29 kV to plantar warts smaller than 6 mm in size (Veien NK, personal communication in 2005). Since so many patients were exposed to this type of treatment decades ago, it is still a possibility that we in the future will experience more patients presenting with chronic plantar ulcers due to radiation-induced skin cancer.

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