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## **What is Radiodermatitis?**

Chronic radiodermatitis is a disease most commonly found in doctors whose hands have been exposed over the years to the ionizing radiation used in radiodiagnostic procedures.

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The sufferers were usually pediatricians who held children while observing them using radioscopy, and orthopedic surgeons who fixed fractures under X-rays. Nowadays this condition is much less

common, because it was linked with the use of the sort of radioscopic equipment used in the 1950s and 1960s, that afforded little protection.

Whether chronic radiodermatitis develops depends on a number of factors, including the type of equipment and radiation used, the duration of exposure, the configuration of the beam and the number of procedures carried out per year.

The first signs of chronic occupational radiodermatitis may appear after one, two or three years of cumulative exposure. For tumors to appear (indicating the presence of skin cancer) it tends to take considerably longer.

The usual parts affected by chronic occupational radiodermatitis are the hands, especially the left hand in the case of orthopedic surgeons, due to the position it takes when carrying

out operations. The fingers most commonly affected are the dorsum and medial side of the index, middle and ring fingers.

Initially, the clinical features are not very marked. The skin on the dorsum of the fingers becomes dry, shiny and hairless, and the nails become more brittle and develop longitudinal lines.

Chronic occupational radiodermatitis has three stages: simple, progressive, and malignant.

With simple chronic radiodermatitis, the skin becomes dry, fine, and hairless due to atrophy of the epidermis, and is easily vulnerable to minor trauma. It is also discolored, with areas of increased pigmentation, hemorrhage areas and organized hematoma (black spots). The epidermis presents areas of desquamation, fissuring (linear ulcers) and micro-ulcers. The ridges

of epidermis which form the fingerprints also disappear.

With progressive chronic radiodermatitis wart-like formations and ulcers appear, which continue to worsen even after exposure to radiation has ceased. Hyperkeratotic plaques and painful keratoses form on the sides of the fingers and fingertips. At this stage the hands lose their flexibility. Around the edges of the ulcers caused by radiodermatitis, pseudoepitheliomatous hyperplasia may occur. The skin develops telangiectases, and areas of epidermal atrophy and dermal fibrosis. Progressive chronic radiodermatitis frequently gives rise to a painful burning sensation.

With malignant chronic radiodermatitis, neoplastic transformation develops in the ulcers or the keratoses. The

commonest histological types are Bowen's disease (squamous cell carcinoma in situ), squamous cell carcinoma, and basal cell carcinoma (rodent ulcer). These tend to appear at a much later stage, often as much as twenty or thirty years after exposure to radiation. From a clinical point of view malignant chronic radiodermatitis is apparent as areas of ulceration with poor wound healing.

At a later stage, the disease may metastasize via the lymphatic system to local lymph nodes and also, via the blood, to organs.

Both the development of the disease locally, and any localized or distant metastases that may occur, are very difficult to treat. In general, to prevent the localized disease from spreading, drastic surgery is recommended, such as amputation of the affected fingers or even of the

hand or forearm, and irradiation or dissection of the epitrochlear or axillary nodes on the affected side. As a rule, even patients in the localized stage of the illness do not get better.

In the medical bibliography available, no references can be found to the spontaneous remission of radiodermatitis or of malignant or pre-malignant developments which had occurred more than ten years after the onset of the disease. The same is true of recent clinical literature, where not a single case can be found of spontaneous remission in patients who have suffered from advanced chronic radiodermatitis produced by prolonged diagnostic radiation, or who have developed epidermal carcinoma following radiodermatitis.

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