Contact Radiotherapy of Cutaneous Hemangiomas

Therapeutic Effects and Radiation Sequelae in 818 Patients

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Summary. The paper presents statistical data on the therapeutic effects and radiation sequelae following Chaoul contact therapy of 818 cutaneous hemangiomas treated between 1938 and 1952. 73.3% of all irradiated hemangiomas showed initial improvement but complete involution with an excellent cosmetic result was observed in only 50% of lesions 5 years after treatment. During the same period of time, more than one-third of all patients developed mild to moderate cutaneous radiation sequelae (hyper- or hypopigmentation and telangiectases, rarely atrophy). The high incidence of late radiation effects is probably related to the high total doses administered in this series of patients, the very short intervals between treatments and the age of the patients. Other radiation hazards are also discussed. Since large studies have proven conclusively that spontaneous involution occurs in 95% of hemangiomas after several years, indications for radiotherapy of hemangiomas are extremely limited.

Ionizing radiation was the treatment of choice for strawberry angioma (hemangioma simplex) and cavernous hemangioma by most clinicians until Lister [1] and Walter [2] showed that the large majority of hemangiomas resolve spontaneously in early childhood. Subsequent publications have confirmed these observations [3, 4]. Low dosage radiation therapy is now limited to exceptional cases, particularly those in periorificial locations [5].

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The therapeutic use of radium has declined markedly, not because of its ineffectiveness but because of the problem of radiation protection of the personnel using this modality [6]; contact X-ray therapy [7] or regular superficial X-ray therapy are now preferred in the treatment of these exceptional hemangiomas. Even though individual and total doses recommended to expedite spontaneous involution have decreased considerably over the years there is a lack of information concerning ultimate therapeutic effects and the incidence of radiodermatitis following different dosage schedules.

This paper therefore reviews therapeutic effectiveness, degrees of response and the late side effects of Chaoul contact therapy in 818 patients treated for hemangiomas at the Department of Dermatology of the University of Munich. Contact therapy of hemangiomas was abandoned in 1952 in favor of low dosage soft X-ray therapy from beryllium-windowed machines; a forthcoming paper will report on this group of patients.

**Material and Techniques**

Between December 1, 1938 and September 12, 1952 a total of 1123 patients with vascular tumors were seen. 818 of these patients were treated for strawberry angioma with low voltage Chaoul contact therapy. 11 patients with nevus flammeus were also treated with the Chaoul technique. Most portwine stains, however, were treated with grenz rays or Thorium X applications.

**Sex Ratio and Age at Appearance of the Lesion**

567 of the 818 patients were female and 251 were male (a ratio of 2.2:1). In 321 patients the first appearance of the hemangioma was specifically noted. In 69.2% of the hemangioma was noticed immediately after birth while in 96% of all patients the hemangioma was present by 6 months of age (Table 1). In rare cases hemangiomas appeared at a later date (childhood or even school age). In one unusual case a new hemangioma developed in the face of a 35 year old female patient.

**Localization of Single and Multiple Lesions**

In 8.5% of 818 patients the hemangioma occurred as an isolated lesion; in 11.6% two lesions were noted. The maximum number of lesions was five (Table 2). The distribution pattern of 1062 hemangiomas showed a clear preference for the head region (over 50% of patients). Lesions on the trunk were slightly more frequent than lesions on the extremities (Table 3). 13 infants with hemangiomas in the gluteal region presented with ulcerations.

**Age at Onset of Therapy**

Most patients received radiotherapy between the age of 4—15 months (77.2%). Only 8% were treated during the first 3 months of life. In 8% of the patients treatment was not started until the age of six or later. 46 patients had been treated previously: 25 by surgery, 10 by electrodesiccation and 5 by cryotherapy with carbon dioxide snow. 6 other patients had been treated elsewhere either with x-rays (4 patients) or with radium or Thorium X.

**Radiation Technique and Dosage Schedule**

Treatments were given with the Siemens Monopan Unit at 60 kV, 4 mA with 0.2 mm copper filter. The half-value layer (HVL) of this radiation was 4.3 mm Al. Depending on the target-skin distance (TSD) of 1.5, 3, or 5 cm the resulting half-value depth (D½) was 3.5, 9 and 12 mm. (The newer Philips x-Ray contact apparatus operates at 45 kV with a half-value layer of 0.3 mm Al and a D½ of 5 mm.) A D½ of 3.5 mm was used in only 2 patients.