Oestrogen and Progesterone Hormone Receptors in Dupuytren's Disease

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Dupuytren's disease is associated with alcoholism and chronic liver disease, conditions frequently associated with deranged steroid hormone metabolism. The possible influence of endogenous sex steroid hormones on the development of Dupuytren's disease has therefore been investigated.

An analysis of diseased palmar fascia for oestrogen and progesterone receptors was undertaken in fifteen patients. Hormone specific receptors were not found in the palmar fascia of our patients with Dupuytren's disease, thus suggesting that other mechanisms or factors contribute to the pathogenesis of this fibrotic process.

The pathogenesis of Dupuytren's disease remains unknown (Early, 1962; McFarlane, 1974; Chiu, 1978). While detailed biochemical and ultrastructural studies have provided insight into the physical characteristics and behaviour of this fibrotic process, the origin remains speculative (Brickley-Parsons, 1981; Gelberman, 1980; Kischer, 1984). A genetic predisposition is readily acknowledged based upon numerous reports (Early, 1962; Ling, 1963). Tissue typing studies have not, however, been consistent and have not demonstrated specific associated antigen markers (Burch, 1966; Hardy, 1961; Hunter, 1981; Spencer, 1984; Tait, 1982). The role of trauma as a precipitating factor in the pathogenesis of Dupuytren's contracture also remains controversial and unresolved (Bennett, 1981; Chiu, 1978). Abnormal tissue oxygen tension related to microvascular ischaemic insults and a subsequent reparative fibrotic reaction provides an interesting hypothesis as to the pathogenesis of this condition (Kischer, 1984).

Alcohol consumption appears related to the evolution of Dupuytren's disease and its diathesis, but the mechanism by which this agent acts is unknown (Arieff, 1956; Billig, 1975; Lund, 1941; Wolfe, 1956; Zachariae, 1970). Alcohol induced microcirculatory changes may contribute to the ischaemic events and subsequent reparative fibrotic process previously mentioned (Kischer, 1984).

Oestrogen and progesterone can act on target organs and tissues and influence local soft tissue characteristics (Thomas, 1984). Oestrogen receptor assays are frequently utilized to identify patients with breast cancer who may respond to hormonal treatment regimens (Howanitz, 1981; Van, 1984; Wittliff, 1984). The deranged steroid hormone metabolism present in alcoholics (Mendelson, 1979; VanThiel, 1974) is related to the associated liver and gonadal dysfunction. Feminization of male alchoholic patients is due to this altered hormone metabolism. Could the aberrant levels of endogenous steroid hormones seen in this patient group, also have a direct effect on the palmar fascia? The stimulation of appropriate steroid receptors in the palmar fascia by the alcohol induced elevated levels of oestrogen and progesterone might then promote the fibrosis and contracture seen in Dupuytren's disease. This project was undertaken to investigate this hypothesis.

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Methods and Materials

Fifteen consecutive male patients with Dupuytren's disease were entered into the study. The average age of this group was sixty-two years (range 45-82 years). Eleven patients admitted to a history of moderate alcohol intake. Liver function laboratory studies in these eleven patients fell within the limits of the normal range. Patients with severe hepatic dysfunction were judged not to be candidates for the elective surgical procedure. Each of the fifteen individuals had significant involvement of their palm and/or digits with metacarpophalangeal joint flexion contractures of at least 30° in affected rays. Operative treatment was recommended and subtotal palmar fasciectomies were performed.

The excised diseased fascia was immediately placed in an empty container which rested in an ice bath. Within ten minutes the specimen was rinsed in ice cold saline in order to remove excess blood from the specimen and then frozen in a liquid nitrogen bath to a temperature of minus 70 degrees Celsius. Tissue pieces were pulverized in steel mortars previously cooled on liquid nitrogen. The powdered suspended tissue was then homogenized and centrifuged. The supernatant thus prepared was the cytosol assayed for the hormone receptors. These procedures were performed at 0° Celsius in order to preserve any temperature labile hormone receptors. Absorption capacity binding data was obtained from the supernatant after incubation with five concentrations of labelled hormone. Dextran coated

charcoal-glycerol assays were then performed for both oestradiol and progesterone.

Results

With the specific techniques available, tissue receptors for oestrogen and progesterone could not be detected. The possibility exists that other hormones or metabolites could be responsible for provoking Dupuytren's contractures. However, at this time, the pathogenesis of this disease remains unknown.

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