Giant-cell tumour of the tendon sheath

IS RADIOTHERAPY INDICATED TO PREVENT RECURRENCE AFTER SURGERY?

Prakash P. Kotwal, Vikas Gupta, Rajesh Malhotra

From the All India Institute of Medical Sciences, New Delhi, India

Giant-cell tumour of the tendon sheath, also called pigmented villonodular synovitis, is a benign tumour with a high incidence of recurrence. We have tried to identify risk factors for recurrence. Of the 48 patients included in the study, 14 received radiotherapy after surgery. Only two (4%) had a recurrence. This compares favourably with previously reported incidences of between 25% and 45%.

*J Bone Joint Surg [Br] 2000;82-B:571-3.
Received 30 June 1999; Accepted 24 September 1999*

Giant-cell tumour of the tendon sheath is usually a firm, nodular, well-defined tumour-like mass occurring commonly on the palmar aspect of the fingers and hand. It is a benign lesion characterised by a pleomorphic cell population, which includes lipid-laden foam cells, multinucleated giant cells and round or polygonal stromal cells, often with deposits of haemosiderin in a collagenous stroma. Local recurrence is a troublesome complication after excision. Solitary tenosynovial nodules in the digits of the hand have been reported to recur in 7% to 45% of patients.¹⁻⁴ Radiotherapy has been recommended to prevent recurrence after excision.⁵⁻⁷ We carried out a prospective study to assess the effectiveness of prophylactic radiotherapy in the postoperative period in selected cases to prevent recurrence.

Patients and Methods

Between 1986 and 1997 we treated 48 patients with giant-cell tumour of the tendon sheath of the hand. There were 30 women and 18 men with a mean age of 34.6 years (11 to 58). The mean duration of symptoms was 30 months (4 months to 8 years). Gradually progressive swelling was the only symptom; no patient complained of pain. A pre-

operative diagnosis of a giant-cell tumour of the tendon sheath was made in 42 patients. No patient had multiple lesions. The distribution of the lesions in the hand is shown in Table I. In six patients the lesions were on the dorsal aspect (Fig. 1), while in 31 the swelling was on the palmar aspect. In the other 11 patients the lesions were almost circumferential. Most were 3 to 4 cm in diameter and were firm, fibrous, lobulated and partially circumscribed by a fibrous capsule which was lacking in places. The cut surface of the tumour was grey-white mottled with pink, brown or yellow. Although meticulous surgical excision was attempted in all patients, in six it was considered to be incomplete.

Results

All the 48 lesions fitted the classical histological description of pigmented villonodular tenosynovitis⁸ (Fig. 2). Histological examination showed that the tumour was composed of a single set, or groups, of rounded or polygonal cells with round nuclei and faintly eosinophilic cytoplasm interspersed among giant cells. Foci of xanthomatous changes were seen. Granules of haemosiderin were present in the cytoplasm of the stromal cells, especially the foam cells. The giant cells were irregularly distributed and had a deeply eosinophilic cytoplasm with a variable number of nuclei ranging from four to 40. Mitotic figures, seen in eight cases, varied in number (2 to 6 per 10 high-power fields). There were no atypical mitoses. Neither bone, cartilage, calcification, cartilage debris or necrosis was seen. Plain radiographs showed soft-tissue swelling in 42 patients (Fig. 3). No bone erosion was seen.

Table I. The distribution of giant-cell tumour of the tendon sheath in the 48 patients

Site	Number
Thumb	4
Index finger	16
Middle finger	10
Ring finger	12
Little finger	4
Palm	2
Total	48

P. P. Kotwal, MS Orth, Professor
V. Gupta, MS Orth, Senior Resident
R. Malhotra, MS Orth, Associate Professor
Department of Orthopaedics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India.

Correspondence should be sent to Professor P. P. Kotwal.

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0301-620X/00/410328 \$2.00

Fig. 1

Photograph of a patient with a predominantly dorsal giant-cell tumour of the tendon sheath.

Fig. 3

Plain radiograph showing soft-tissue swelling in the fifth digit as a result of giant-cell tumour of the tendon sheath.

After operation, 14 patients, who had either mitotic figures or possible incomplete excision, were treated with local irradiation at 20Gy in divided doses (2Gy surface dose daily at 200kV). Patients in both the irradiated and non-irradiated groups were followed up for a mean of 52 months (24 to 132). No recurrences were seen in the

Fig. 2

Photomicrograph of a giant-cell tumour of the tendon sheath.

irradiation group. Two patients in the non-irradiated group had a recurrence. There were no local complications attributable to the irradiation.

Discussion

Jaffe, Lichtenstein and Suto⁹ regarded the synovium of the tendon sheath, bursa and joint as an anatomical unit in which giant-cell tumour of the tendon sheath, also called pigmented villonodular synovitis, may occur. Localised and diffuse forms of pigmented villonodular synovitis arise in joints while extra-articular forms occur in bursae.^{3,4,10-13} In lesions related to tendon sheaths, complete excision is often difficult due to spread into the neighbouring synovium.⁸ Careful complete excision is required in order to prevent recurrence. Jaffe⁵ recommended radiotherapy in a dosage of 15 to 25 Gy given in divided doses of 1.5 Gy daily when treating recurrences. This led us to investigate the role of postoperative radiotherapy as prophylaxis against recurrence. It was not necessary to give radiotherapy to all patients and we chose those in whom there was: a) possible incomplete excision; b) the presence of mitotic figures on histological examination; or c) involvement of bone.

Although mitosis may indicate an activity, there is no evidence to suggest that these lesions are malignant or prone to metastasis.¹⁴ Malignant forms have also been described and are distinct from synovial sarcomata.^{15,16}

In our study, the rate of recurrence was 4% which is lower than previously reported rates of 25% to

45%.^{3,4,10,14} There was no recurrence in patients who had radiotherapy. Since they were considered to be a high-risk group for recurrence we suggest that there is a role for radiotherapy in preventing local recurrence. We conclude that meticulous excision of giant-cell tumours of tendon sheath reduces the incidence of recurrence, and that post-operative radiotherapy in these cases is not indicated. Radiotherapy may have a role in cases in which complete excision may not be possible.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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