



## **The Impact of Inappropriate Surgery as the Primary Operation on Local Recurrence and Distant Metastases of Limb and Limb Girdle Soft Tissue Sarcomas**

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### **Aims**

Surgical resection with clear margins remains the only curative treatment for soft tissue sarcomas. Resection margin status is an important prognostic factor for local recurrence. Inappropriate excision - either enucleation or marginal excision - is often performed when a soft tissue mass is presumed to be benign and the differential diagnosis of sarcoma has not been entertained. The aim of this study was to assess the impact of inappropriate surgery on local and distant recurrence.

### **Methods**

A prospectively-kept sarcoma database was searched to identify all patients referred to our Sarcoma Unit between 2001 and 2005 who had undergone an enucleation or marginal excision of a sarcoma, where the pre-operative diagnosis was presumed benign. Patient and tumour characteristics were collected, as well as operative and histopathological data. Patients were staged according to the UICC classification of soft tissue sarcomas. Primary endpoints assessed were the incidence of local and distant recurrence in this cohort of patients.

### **Results**

Between 2001 and 2005, a total of 2121 patients were referred to our unit upon suspicion of a sarcoma at any site. Referrals for limb and limb girdle sarcomas were assessed, and patients presenting with recurrent tumour, synchronous metastases and those managed non-operatively were excluded. A total of 367 patients were identified, 134 of whom were referred for further management immediately following inappropriate surgery. 78 (58%) were male, and the median age of 56 years. Only 5% had a biopsy prior to initial surgery, and 20% had radiographic imaging. Of known cases, 51% had their excision under general anaesthesia, and 20% under local anaesthetic. 78 (58%) had positive resection margins after excision, with only 14 (10.5%) of cases negative (unreported  $n=42$ ; 31.5%). 100 tumours (75%) were superficial, to the investing fascia, and 34 (25%) were deep. 80 tumours (60%) were <5cm, 42 (31%) between 5.1-10cm and 12 (9%) >10.1cm. Grade 1 tumours accounted for 43 (32%) cases, Grade 2 42 (31%) and Grade 3 25 (19%), with unreported grade in 24 (18%) of cases. Median follow up for these patients was 51 months. Of patients with Stage I disease ( $n=42$ ), 11 (26%) developed local recurrence, with a median time of 24 months to first recurrence (range 4-62 months). Distant metastases developed in 2 cases (4.7%), with a median time of 54 months. Stage II patients ( $n=51$ ) developed recurrence in 14 cases (27.4%), with a median time of 18 months (range 7-72 months). 10 patients (19.6%) developed metastatic disease, with a median of 20 months. Stage III ( $n=16$ ) patients accounted for 6 cases (37.5%) of local recurrence (median 10.5 months; range 3-35 months), with 11 patients (68.7%) diagnosed with metastases (median 9 months). When compared to stage-matched historical controls in the reported literature, who have had one definitive operation, the local recurrence rates in this study cohort are higher. Further management at our institution included surgical resection of the scar and tumour bed ( $n=121$ ), observation ( $n=8$ ) and radiation therapy to the tumour bed ( $n=5$ ). Of the former cohort, 116 wide local excisions, 4 compartmentectomies and 1 digit amputation were performed. Of 64 patients with a positive initial margin, but with a negative margin following a definitive operation, 13 (20%) developed

local recurrence at a median of 23 months. Furthermore, 11 of these patients died of disease at a median of 21 months.

### **Conclusion**

The incidence of local recurrence is increased in patients who have undergone inappropriate excisions, with the prognosis worsening as stage increases. When compared to matched controls who have had a single definitive operation, the local recurrence rate is higher. Further definitive surgery with negative margins still results in high local recurrence rates. These findings are almost certainly due to the high proportion of positive margins following an enucleation or marginal resection.