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PII: S0959-8049(97)00399-7

Arbiter

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THE JUDGMENT as to whether a soft tissue sarcoma should be managed with a limb-salvaging resection or an amputation is based on three criteria—the oncological soundness of the procedure, the surgical soundness of the reconstruction and the wishes and lifestyle of the patient.

When the patient presents without evidence of nodal or distant metastases, the oncological soundness of the definitive surgical procedure has been judged by the risk of local recurrence. The presence of a local recurrence has been reported to increase the risk of subsequent metastasis as recently as 1990. In turn, the factors that influence the risk of local recurrence have been identified as the quality of the surgical margin and the response of the patient and the tumour to radiation therapy, chemotherapy or combinations of both. The lowest risk of local recurrence is achieved with a radical margin with an increasing incidence with wide, marginal and intralesional margins when surgery alone is employed. When a satisfactory response to pre-operative radiation therapy is achieved, wide *en bloc* excision for high-grade lesions and marginal *en bloc* excision for low-grade lesions has achieved a modest risk of recurrence (< 10%). The risk of local recurrence after a satisfactory response to chemotherapy appears to be comparable, although the evidence is less convincing than for the more widely used radiation. Intralesional procedures—whether planned debulking, inadvertent contamination or the result of 'shell-out' excisional biopsy—have resulted in unacceptable rates of local recurrence (40–60%). With the premise that local recurrence predisposes to increases in metastasis and decreases in survival, only wide or radical procedures have been deemed adequate, with the caveat that it makes no difference whether the margin is attained by limb salvage or amputation.

The premise that local recurrence correlates unfavourably with survival has recently been challenged by several reports, as pointed out by Eggermont and the need for amputation, when only amputation will obtain a presumably adequate margin, has been denigrated. This difference in opinion is at the heart of the oncological criteria. Unfortunately, as pointed out by Gunterberg (see pp. 2295–2297), the nature of the problem (small numbers of cases, differing histological variants, differing lesion sizes, varying anatomic sites and varying stages) does not allow a firm conclusion based on retrospective evaluations with inadequate statistical methodology. Perhaps only a prospective randomised trial will have the possibility of settling this issue. Such a trial, with the practical and ethical difficulties it presents, is not likely in the near future.

The second issue, that of the functional outcome of amputation versus limb salvage, is perhaps of second importance to life survival. It is quite clear that serious complications that produce functionally unsatisfactory outcomes are much more common following limb salvage, particularly when adjuvant radiation therapy/chemotherapy are employed to facilitate limb salvage. These complications (local recurrence, pathological fracture, unhealed wounds, uncontrolled infection) often lead to repeated surgical procedures occasionally ending in an amputation.

In some anatomic sites, especially in the lower extremity below the knee, artificial limbs are functionally superior to limb-salvaging procedures that require significant neurological or skeletal loss. It is also quite clear that the functional outcome of a primary planned amputation is significantly better than that of a secondary, unplanned amputation.

The third issue, the customising of the procedure to the needs and desires of the individual patient, has not received

the attention that the oncological and functional outcomes have. What few studies have been done have involved patients treated for bone sarcomas rather than soft tissue lesions. Despite this, the issues are quite comparable. In none of these reports has the hypothesis that the quality of life is better after limb salvage been validated. Again, however, the data are retrospective, the numbers small, the experience time-limited, and the criteria subjective so that concluding one or the other procedure is indicated in all patients is quite fallacious.

The advances in staging and diagnostic techniques, adjuvant therapies, surgical and rehabilitative techniques and the centralisation of the care of these patients in the developed countries over the past three decades has led to a massive shift away from amputation as the definitive procedure for soft tissue sarcomas. Experience gained during this period demonstrates that the judgment as to whether an individual patient is better managed by limb salvage or amputation is a complex decision based upon physician expertise, facilities available, patient's lifestyle and culture, as well as statistical analyses of local recurrence, metastasis and survival and functional outcome studies and that the controversies these complexities engender, given the nature of the problem, are not likely to be resolved without considerably more knowledge than we currently possess.