editorial are neither latter-day Luddites nor clinical Canutes trying to stem the tide of orthopaedic progress. But we do believe that it is not enough to train surgeons to be expert metal workers; they need to master all the available techniques of treatment, and then develop the wisdom to choose between them.

Surgeons who are justifiably proud of their operative technique and take pleasure in teaching it sometimes set a bad example by relegating non-operative methods to uninstructed juniors, thereby implying that conservative treatment is easy; unhappily it is not. Charnley wrote long ago that "contrary to popular opinion, the operative treatment of fractures is much simpler than the non-operative" and he was right. Courses and training in conservative methods are as important as those on the techniques of fixation. Every surgeon who treats fractures needs to know both. Only then will every patient have a chance of being treated by the method which is best for him and also most cost-effective for the community.

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**Prognostic factors in soft-tissue sarcoma**

The staging of tumours is essential for the assessment of prognosis and for the comparison of the results of treatment in different series. It is important also in the selection of patients for treatment including the definition of groups at high risk from metastasis in whom adjuvant systemic therapy may play a useful role. The identification of prognostic factors requires adequate numbers of patients and appropriate statistical analysis. In the case of soft-tissue sarcoma a pioneer study was undertaken by Russell et al (1977) who analysed the outcome in 1215 patients from 13 institutions over a 15-year period. This formed the basis of the American Joint Committee staging system (Beahrs 1988) for these tumours in which, notably, histological grade (G) joined the customary factors of tumour size, lymph-node involvement and the presence of distant metastases (T, N, M) as a crucial prognostic factor.

Since that time a number of studies have sought to answer the following critical questions: which factors determine the risk of local recurrence at the primary site and which influence the risk of blood-borne metastases, the principal cause of death from sarcomas of the extremities? The paper by Saddegh et al (page 495) from the Karolinska Hospital reports an analysis of 137 patients with tumours of the trunk, limbs and limb girdles. They use multivariate analysis to elucidate their data. This is important since, as they point out, univariate analysis entails the risk of identifying factors as prognostic which are merely intercorrelated with true prognostic factors. Their positive findings that size and grade were the major determinants of death from tumour are confirmed in many studies similarly and correctly analysed. They studied intracompartmental versus extra-compartmental site as a factor and found no correlation which was also a finding of the Lund Group (Rööser et al 1988) and of a recent major study of 826 patients, including 453 with limb and limb-girdle sarcomas, from the Royal Marsden Hospital, London (Robinson, personal communication, 1992).

Interestingly, and perhaps surprisingly, Saddegh et al found no difference in tumour size between intra- and extracompartmental lesions. In any series in which the extracompartmental tumours are larger than the intra-compartmental, compartmentality examined by univariate analysis would, in contrast, be expected to correlate with mortality. Such covariation may explain the reported effect of compartmentality on prognosis (Enneking 1983).

Analysing factors which correlated with local recurrence, the Karolinska group found that only surgical margin and tumour size were significant. This is somewhat at variance with the Royal Marsden series in which tumour size was found not to influence the rate of local recurrence, although adequacy of local treatment, both surgical margin and radiotherapy, was significant as was histological grade.

Many factors may influence the differing conclusions drawn from different studies, quite apart from statistical technique. These include the size of the study group, its composition and the philosophy and methods of treatment used. Gustafsson and Rydholm (page 501) report an analysis of 256 patients with soft-tissue sarcomas of the extremities to determine if prognostic factors had any influence on how surgery was performed. They did find a selection bias in treatment, notably that high-risk surgical margins were more common in patients with large and deep-seated tumours, both poor prognostic factors, than in the more favourable group with small subcutaneous tumours. They conclude that selection bias in treatment may thus confound analysis of the relationship between
surgical clearance and prognosis, although they do not indicate whether the above groups were matched for grade. They address the question, as do Sadegh et al, whether the increased risk of metastases in patients with local recurrence is a consequence of that local recurrence or simply an expression of covariation between local and distant aggressiveness. That question has not yet been satisfactorily answered. The possibility of metastases from local recurrence, although it may be small, cannot be excluded in some patients (Stotter et al 1990).

What is the surgeon to make of this plethora of statistical information when faced with a patient with a soft-tissue sarcoma? There is no doubt that the achievement of adequate surgical margins of clearance diminishes the risk of local recurrence and that, where these margins are unsatisfactory, radiotherapy substantially improves the chances of local control, especially in high-grade tumours (Karakousis et al 1986), thus permitting the salvage of many limbs for which amputation would otherwise be inevitable. This is reflected in the low amputation rate (12%) reported by Gustafson and Rydholm.

What can be done to reduce mortality from the disease? At sites such as the head and neck and the retroperitoneum, failure of local control leads to death, but in the extremities local recurrence is usually salvageable by amputation and the major cause of death is metastatic disease. However weak the influence of local failure is on the risk of metastasis, local control is clearly important in its own right. The identification of high-risk factors for blood-borne spread is, however, only of value to those patients whose cancers may respond to systemic adjuvant therapy, for example, non-seminomatous germ-cell tumours of the testis and, to a less although still important degree, some malignant primary tumours of bone. Sadly, there is as yet, no effective systemic adjuvant therapy for most adult soft-tissue sarcomas. When it does become available, the careful studies reported in this issue of the Journal and elsewhere will bear fruit in providing pointers towards those patients in whom such treatment, to date both toxic and costly, will be best applied.

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REFERENCES


