GIANT-CELL TUMOUR OF BONE

No bone tumour has provoked more controversy than the giant-cell tumour. Its nomenclature, diagnosis and treatment have all, at various times, been in dispute, and only recently has there emerged some measure of agreement regarding management.

In the nineteenth century the term myeloid sarcoma was in common use, but it was discarded when it was realised that these tumours were not as lethal as other bone sarcomata. In 1910 Bloodgood proposed the term “benign giant cell tumour”. For a time this was accepted, but reports began to appear of metastases to the lungs from giant-cell tumours which were in most respects similar to those previously regarded as benign. In 1922 Stewart proposed the term “osteoclastoma”: it was adopted by many British pathologists and, until recently, was in common use. It is now less frequently employed, for there is no convincing evidence that the giant cells—which are the striking features of these tumours—are derived from osteoclasts. The most satisfactory term, and the one which has found general acceptance, is giant-cell tumour of bone, which recognises that although the majority of these tumours are benign there are a few which are malignant from the outset and others which become sarcomatous after unsuccessful treatment.

In this Journal McGrath contributes an analysis of fifty-two giant-cell tumours that were recorded in the Bristol Bone Tumour Registry over a period of twenty-five years. He points out that the tumour is rare—a fact not always appreciated, for there is still a tendency to group it with other lesions which may be loosely described as variants of giant-cell tumour.

Over thirty years ago Jaffe, Lichtenstein and Portis (1940) insisted on stricter criteria for the diagnosis of giant-cell tumour. They maintained that the presence of giant cells, even in considerable numbers, was not sufficient to establish the diagnosis, which can only be based on all the clinical, radiographic and histological features of the tumour. Giant cells are present in several other lesions of bone—aneurysmal bone cyst, simple bone cyst, non-ossifying fibroma, benign chondroblastoma of bone and the so-called brown tumour of hyperparathyroidism. However, all these lesions have other well defined clinical, radiographic and pathological characteristics which serve to distinguish them from a true giant-cell tumour, and hyperparathyroidism can be eliminated by a study of the calcium metabolism. Most of these lesions occur in childhood and adolescence and all except benign chondroblastoma tend to involve the shaft or metaphysis of a long bone, whereas a giant-cell tumour typically involves the articular end of a long bone in a patient who is skeletally mature. Most giant-cell tumours are invasive and aggressive in their behaviour. They often recur and may become malignant after unsuccessful treatment. Occasionally they are malignant from the outset and are then often situated in unusual sites, as were two of the three tumours reported by McGrath.
The high recurrence rate after curettage and the risk of sarcomatous degeneration in tumours treated by irradiation have caused some surgeons to recommend radical excision for all tumours in which this is surgically feasible. No one doubts the wisdom of this approach when the tumour is in a site such as the head of the fibula, but is it justified for tumours of the lower end of the femur or the upper end of the tibia, where resection must be followed by a major reconstructive procedure? The policy may change when prosthetic replacement or a massive homograft can be employed with greater confidence than is possible today.

McGrath reports a recurrence rate of 45 per cent after curettage and grafting, but he points out that the results were much better in those patients in whom the notes indicated that the operation had been performed with a proper respect for the known tendency of the tumour to recur. This is certainly the experience of the writer. Curettage alone must be condemned. Dahlin, Cupps and Johnson (1970) reported a recurrence rate of 68 per cent after this procedure, and in the series of Goldenberg, Campbell and Bonfiglio (1970) there was a recurrence in all but eight of the forty-five tumours treated in this manner. This indicates that grafting is an important part of the procedure. After a thorough curettage down to healthy bone, which makes it unnecessary to cauterise the cavity by agents such as zinc chloride or 70 per cent alcohol, the cavity should be carefully and completely packed with cancellous bone taken from the ilium. Kiel bone should not be used because it has a limited osteogenic property. Curettage and grafting is unsuitable for tumours which have destroyed both condyles or the whole width of the articular end of a long bone or penetrated the neighbouring joint: for these tumours resection or amputation is the only appropriate procedure. There will be some recurrences even after careful selection and meticulous technique, but the risk of malignant transformation in a benign tumour treated surgically is negligible, and if the tumour recurs a cure can usually be obtained by a more radical procedure.

In recent years irradiation has declined in popularity. There is no question that cures are obtained, but the rate of recurrence is no less than after curettage and grafting and the risk of a sarcoma developing at the site of the tumour, often many years after treatment, is appreciable. This complication occurred in four of the twelve tumours treated by radiotherapy in the Bristol series and in seven of the thirty-six giant-cell tumours in the series reported by Dahlin and his colleagues. It may be argued that the tumours selected for irradiation are often those in unfavourable sites, particularly the sacrum, which have a greater propensity for malignant change than giant-cell tumours in the long bones. Even so, there is no evidence to indicate that irradiation is superior to curettage and grafting and surgical treatment should be preferred whenever possible. There is no justification for combining surgery and irradiation. If curettage has been adequately performed, irradiation has nothing to add except the risk of sarcomatous degeneration.

Most pathologists are now agreed that it is not possible to identify the benign tumours in which recurrence might be expected by the system of grading advocated by Jaffe. In his paper McGrath makes the important observation that "no recurrence of a typical tumour in a long bone that appeared within two years of primary treatment was malignant". If this is confirmed, conservative surgery may be considered for the recurrence of a typical tumour, but it would probably be wise to resect these tumours rather than make a second attempt at curettage and grafting, unless it is known that the technique of the original operation was inadequate. This still leaves the difficult problem of the management of a recurrence in an atypical tumour. Many of these will prove, on review, to be malignant giant-cell tumours, and amputation will be necessary. Sacral tumours present many problems. There is a high rate of recurrence and malignant change is common. Resection of these tumours is seldom feasible and there may be no alternative to radiotherapy.

A tumour which appears in the same situation as a giant-cell tumour, which was treated by irradiation several years previously, will almost certainly prove to be a fibrosarcoma or rarely an osteosarcoma. Biopsy is necessary to establish the diagnosis: if this confirms the
malignant nature of the tumour amputation must be performed. The prognosis for long-term survival is poor. There are now a number of authentic reports of benign giant-cell tumours that have metastasised to the lungs. If a review of the histology of the original tumour indicates that it was probably cytologically benign there should be no hesitation in resecting the affected lobe, for there is a good prospect of long-term survival in these patients.

Finally, I would like to commend to the readers of this Journal the valuable article by McGrath. It is a clear exposition of the present position on the treatment of giant-cell tumour, based on a careful review of the well-documented cases in the Bristol Bone Tumour Registry.

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REFERENCES


