Important Advances in Clinical Medicine

Epitomes of Progress—Orthopedics

The Scientific Board of the California Medical Association presents the following inventory of items of progress in orthopedics. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in orthopedics that have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Orthopedics of the California Medical Association and the summaries were prepared under its direction.

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Injection of Steroid Agents in Solitary Bone Cysts

THE CAUSE OF SOLITARY (simple, juvenile, unicameral, benign) bone cysts is unknown, but most occur in the proximal ends of long bones in a growing skeleton. They are seen more commonly in male patients (2:1) and more than two thirds occur in the humerus and femur. They are ordinarily seen with a fracture through the thin cyst wall, but occasionally are noted as an incidental finding. An undisturbed cyst is filled with clear yellow fluid that has many characteristics of serum transudate. The cavity is lined with a membrane but has been shown to communicate directly with major regional veins.

Any pathologic fracture should be a cause for concern. Although carefully interpreted x-ray studies are pathognomonic in only 10 percent of cases, they usually establish a tentative diagnosis for reasonable early treatment. Immediate intervention risks the conversion of a closed fracture to an open one, but a properly managed fracture routinely heals without complication. Unless the cyst is obliterated, refracture can be expected. A few cysts (15 percent) will heal after one or more fractures, but if healing of a fracture does not proceed normally, a diagnosis should be made without delay. Diagnosis is confirmed by aspirating an amount of fluid compatible with the size of the cyst. If no fluid is obtained, it can be assumed that a solid tumor is present and biopsy is indicated.

Surgical intervention is the only effective treatment. A curettage and bone graft procedure is successful in a little more than half of cases. Extensive surgical treatment is probably more successful but is not advised in a routine case. Injection of cortisone in a solitary bone cyst was first reported in 1974, and subsequent observation and experience have shown an improved healing rate compared with curettage and grafting. Injection of cortisone requires general anesthesia and x-ray monitoring or image intensification, but is simple, requires minimal time in hospital, and results in minimal morbidity. Although multiple injections may be required in older patients or larger cysts, almost all will eventually respond. It is important to maintain surveillance of a lesion after apparent healing because recurrence is possible in a small percentage of cases. If the cyst has not recurred at the time of skeletal maturity, later occurrence is unlikely. It appears from the reported experience that injecting cortisone in a

unicameral bone cyst is a definite advance in the management of this perplexing and aggravating lesion.

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Scaglietti O, Marchetti PG, Bartolozzi P: Final results obtained in the treatment of bone cysts with methylprednisolone acetate (Depo-Medrol) and a discussion of results achieved in other bone lesions. Clin Orthop 1982; 165:33-42

Methacrylate Cementation for Giant Cell Tumor

GIANT CELL TUMORS of bone are uncommon, composing approximately 5 percent of true neoplasms of bone. Most are benign but have the potential for metastasis in 2 percent to 6 percent of cases, primarily to the lung. Some studies report a slight female preponderance, and it is generally believed that the tumors occur in the epiphyseal region of the bone after the growth plate closes. About 50 percent occur around the knee but these tumors may occur in any part of the skeleton. They are most often seen in young adults, but may present at any age.

Histologically the giant cell tumor is almost indistinguishable from the brown tumor of hyperparathyroidism, so it is important that serum calcium, phosphate, alkaline phosphatase and perhaps parathormone levels be determined before a treatment plan is formulated.

Surgical intervention is the primary treatment of benign giant cell tumor of bone unless the location precludes reasonable surgical access. X-ray therapy is effective, but may be contraindicated except in extenuating circumstances. Curettage and bone graft failed to eradicate the tumor in almost half of reported cases; amputation is unnecessary in uncomplicated cases. An adequate en bloc resection results in the best local control, but often requires extensive and complicated reconstruction. For these reasons, implantation of methyl methacrylate resin after thorough curettage (wide marginal resection) is more frequently being done. The monomer is inherently toxic to the surrounding tissue, and the polymerization is exothermic, producing a surface temperature that approximates that of pasteurization. Because tumor cells in general are known to be heat sensitive and may be injured by the monomer, implantation of a large bolus of bone cement is theoretically beneficial in tumor control. There are two actual advantages, however. The joint and involved body segments can be rapidly rehabilitated following cementation. Also, gross persistence of tumor surrounding the radiopaque cement is easier to perceive on x-ray films, so that further treatment can be instituted without delay. If there is no evidence of tumor recurrence noted on follow-up evaluation, the cement can either be left in situ indefinitely or removed electively and the cavity filled with bone graft.

In at least one center, methacrylate implantation is done after cavitary cryotherapy using liquid nitrogen, usually followed by later bone grafting. In older or inactive patients who are candidates for total joint replacement, the involved bone can be resected, autoclaved—causing necrosis of the tumor—and returned immediately to the patient with methyl methacrylate supplementation. In this procedure, methacrylate is used to fill the space previously occupied by the tumor and to provide rigid fixation for the total joint implant.

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Limb Replantation

IN THE PAST TEN YEARS limb replantation has progressed from an experimental procedure done in only a few centers to a procedure that is available in many communities. The indications for replantation are now more clearly defined, as the techniques' surgical limitations have been tested and patients who have undergone such procedures have been observed for several years.

Avulsed, crushed and severely mutilated limbs are difficult if not impossible to replant because of widespread tissue destruction. Even the most cleanly amputated part is never normal following replantation. A shortened skeleton, stiff joints, diminished sensibility and cold intolerance are the commonly encountered sequelae, so a patient's functional interests are sometimes better served by having the amputation site closed rather than being burdened with a viable but dysfunctional part. The following sharp, relatively well-localized amputations are potentially suitable for replantation: isolated thumb amputations at any level proximal to the interphalangeal joint; multiple finger amputations at levels proximal to the distal joints, and hand, wrist and forearm amputations.