

Book reviews

Transosseous osteosynthesis—theoretical and clinical aspects of the regeneration and growth of tissue

Gavril A. Ilizarov, 800 pages, Springer-Verlag Berlin, Heidelberg, New York, 1992

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This very impressive volume presents the author's 40 years' experience with his transosseous external fixation technique, which has only recently become known in the West, but is increasingly being used and exploited by non-Russian orthopedic surgeons. Editorial assistance has been given by Stuart A. Green, without whom this book would probably never have been produced.

The book begins with an introductory section, the first chapter of which gives the historical background of transosseous osteosynthesis followed by 589 references, most of them from the Soviet Union and Eastern Europe. Then, follows a thorough description of the Ilizarov apparatus: its individual components, as well as the different principles of its application. It would, indeed, seem to the uninitiated that some frame constructions are unnecessarily complicated and almost impossible to apply by the more occasional user. This chapter bears some resemblance to the directions for the use and maintenance of an automobile engine.

The next 120 pages report the effects of tension and stress on the genesis and growth of tissues. Research techniques employed have been histologic, histochemical, biochemical, and radionuclear scanning. Probably, a great number of dogs have been used to prove that the quality and quantity of newly formed bone in leg lengthening depend on the rigidity of fragment fixation; the degree of damage to the bone marrow, the periosteal soft tissues, and the nutrient artery; the speed of distraction; and the frequency of steps of distraction. A pronounced difference in the osteogenic activity measured as the time required to form new cortical bone of the same density and thickness as the original bone is demonstrated for different rates and frequencies of distraction. A motorized distractor lengthening the canine limb 0.017 mm every 24 minutes (equals 1 mm/day) appears to result in the formation of superior cortical bone.

The influence of the blood supply and the influence of loading on the shape of bones are then discussed. Examples are given how the Ilizarov apparatus makes it possible without bleeding to alter the shape and eliminate deformities of long bones, as well as of the

feet and the spine. Examples are also given of complete healing of necrosis of the femoral head by unloading the hip with an external frame!

The second section presents clinical methods used for upper and lower limb lengthening and/or correction of tubular bone deformities, treatment of fractures, pseudarthroses, bone defects, and osteomyelitis. An abundance of clinical photographs, radiographs, and line drawings of the frame constructions used make this section most enjoyable, and one is impressed by the ability to handle the most difficult of cases, for example, infected pseudarthroses with large bone defects.

The section on treatment of disorders of the foot is likewise very impressive. Nonoperative correction in children means that the common drawback of surgical correction, namely, shortening of the foot, can be avoided. In adults, osseous changes take a considerable amount of time, and treatment using the apparatus is therefore often combined with limited operative intervention, thus shortening the total treatment time. Specially designed curved chisels are used for osteotomies, allowing an immediate peroperative correction, followed by a rather short corrective period in the frame. It is a pity that recommendations on the rate of correction are often not included, which makes this part difficult to use as a handbook. The descriptions of how to lengthen amputation stumps and reconstruct a foot are most fascinating.

The section on treatment of disorders of the hand is rather short and principally consists of case reports of lengthening procedures of metacarpals and digits with the Ilizarov mini-instrument.

Apparently, almost all the disorders of the hip can be treated with the Ilizarov frame. A detailed description is given of the technique for treatment of femoral neck fractures including compression by the apparatus. To me, nail fixation and immediate weight bearing seem far easier for both the patient and the doctor. Also the Ilizarov treatment principles for congenital hip dislocation and coxa vara seem much more complicated than traditional operative intervention; adherence to the principles of Ilizarov almost seems to be an end in itself. All the clinical photographs in the

hip section show the patient's range of motion after treatment, whereas documentation of the motion before treatment is often missing.

A final chapter on the treatment of coxarthrosis by unloading the joint by means of intertrochanteric osteotomies fixated by the frame and encouraged to heal with severe angulation and shortening or lengthening is difficult to understand. A later arthroplasty seems definitely impossible to perform; the development of this treatment modality in Russia is probably due to a dearth of endoprostheses.

The clinical cases presented in the last three sections of the book have been selected from among more than 25,000 patients. It is obvious that a vast experience is necessary to use the Ilizarov methods for treatment of complicated cases, such as infected

pseudarthroses or complicated deformities. For the orthopedic surgeon who is planning to begin using the Ilizarov apparatus even for simple cases, for example, limb lengthening or correction of minor deformities of the tubular bones or the feet, the present volume should be regarded as compulsory reading. This "testament" of Ilizarov, indeed, should be an indispensable addition to the library of every unit treating patients with diseases of and injuries to the locomotor system. Finally, both Dr. Green and Dr. Ilizarov are to be congratulated on a unique presentation.

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Operative nerve repair and reconstruction

Richard Gelberman (ed.), 1,625 pages, 2 volumes, J. B. Lippincott Company, Philadelphia
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Of the 124 contributors of this two-volume work, 109 contributors are from the United States, 2 contributors each are from Canada and Japan, and 11 contributors are from six different European countries, including 4 contributors from Scandinavia.

The 108 chapters are grouped into 24 different parts, to mention a few: "Morphology and Physiology of Peripheral Nerves," "Injury, Degeneration and Regeneration," "Applied Anatomy and Operative Exposure," "Nerve Injury Associated with Fractures," "Peripheral Nerve Compression," "Brachial Plexus," "Spinal Cord Injury," and "Cerebral Palsy and Pain."

To assure the work's usefulness in clinical practice, the editor has requested all the contributors to include clinical recommendations and to provide practical instructions as regards preoperative and postoperative evaluation, surgical technique, and postoperative exercise. In addition, the laboratory scientists have been requested to supply their presentations with a clinical touch. Each chapter begins with "Author's key points," and is richly illustrated with diagrams, drawings, and photographs. Moreover, the references are very comprehensive and updated, with publications through 1990 included; indeed, these references will be extremely valuable to anyone who is undertaking a

survey of the literature in this rapidly growing field of clinical and experimental research.

Although most of the chapters deal with nerve problems of the upper extremity, this two-volume set should not be viewed as one addressed exclusively to hand surgeons. A number of chapters deal with science of a general interest, and quite a few chapters deal with nerve problems of the lower extremity, including those that might arise, e.g., during total hip replacement. Therefore, the work will be of great value to those who are interested in peripheral nerve problems: viz., hand surgeons, general orthopedic surgeons, pediatric orthopedic surgeons, spinal surgeons, and neurosurgeons.

In conclusion, this work is magnificent. It is the most comprehensive one of its kind ever published in this field, and its acquisition must be considered a desideratum for every relevant department, as well as for many private libraries.

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