

S. ORELL, STYRSÖ:

OSTEOSYNTHESIS BY INTERPOSITION OF
TRANSPLANTED BONE

(Author's summary of paper to be published in the *Journal of Bone and Joint Surgery*).

The purpose with »osteosynthesis by interposition« is, in cases of osteotomy, bone- and joint resection, fracture and the like, by means of transplanted pieces of bone, cut to a particular shape and inserted between the existing fragments, to prevent or make more difficult any lateral or lengthwise displacement of the latter. Axial and peripheral displacements can usually be prevented by exterior surgical or orthopedic means of fixation.

The best material for such insertion is bone, cut to the desired spherical, prismatic, cone-, disc-, wedge- or irregular shape, and which, by a preliminary treatment indicated by me, has been freed from all soft tissue¹. The osteosynthesis is carried out by means of an instrumentarium for bone transplantation devised by me and including, among other things, distractors, guiding rod, spatulæ for bone work, and specially designed drilling machines of the type used in dentistry.

Thus, in the same manner in which, in a case of comminuted fracture, a fragment of bone may prevent reposition, and may cause the broken ends to become fixed in a wrong position, it is possible, in a case of osteotomy or fracture, by a similar interposition of bone to obtain the reposition and fixation of the ends in a previously calculated, desired position. This is highly

¹) The principles of this preliminary treatment I have set forth in an article: »Experimentalchirurgische Studie über Knochentransplantate und ihre Anwendung in der praktischen Chirurgie. Vorläufige Mitteilung«, publ. in the *Deutsche Zeitschr. f. Chirurgie*, vol. CCXXXII, fasc. 11—12 1931.

valuable, specially in those cases of osteotomy or fracture in which it is often impossible, or at least very difficult, to secure the fixation, after the ends have been put in place, by external arrangements alone.

(Demonstration of instruments, and of roentgenographs of some cases in which the method was employed).

The cases are divided into two groups: epiphyseal and diaphyseal osteosyntheses. Epiphyseal osteosynthesis was made in three instances after resection of the ankle joint, in cases of tuberculosis of that joint; in three instances after resection of the knee joint, likewise in cases of tuberculosis. In the former, the resected portion was replaced by a disc-shaped piece of transplanted spongy bone; in the latter, broad lamellæ of chiefly compact bone were driven into the spongy tissue of the bone ends, frontally. Diaphyseal osteosynthesis was made in five cases, all in connexion with a subtrochanteric osteotomy, by inserting a spherical piece of bone into the marrow cavities of the two bone ends. In every instance, the wound healed by first intention, and the transplanted bone proved capable of supporting the mechanical pressure to which it was subjected, without collapsing. In the roentgenographs it could even be seen that after 200 to 300 days the pieces transplanted to the epiphyses began to show signs of freshly formed bone structure, and, consequently, of altered construction; while those transplanted to the diaphyses, and inserted in the marrow cavities, relatively soon break up and dissolve, without it having been possible as yet to observe any positive indication of new bone formation.

DISCUSSION:

H. Camitz, Gothenburg:

The author's method of treatment does not appeal to me. One should not unnecessarily complicate an operation. No transplantation of bone is at all necessary when an osteotomia subtrochanterica is carried out. The desired position can be obtained with extreme ease, even if the caput-trochanter part is movable. It is merely necessary to drive a nail into the

trochanter, after which the diaphysis can, without any difficulty, be placed in any desired position.

I cannot find that there is any reason for taking foreign bones for arthrodesis of the knee joint. There exists, as we know, the possibility of employing the patella, as has been done for a long time back.

In pseudoarthrosis of the long bones, one of the most important tasks in transplantation is to carry out fixation well. This is done by using a long graft — about 16—17 cm — well covered with periost. No extra fixation is necessary. If the operation is carried out well, every part will lie firmly in any case.

In my opinion, it is a very great error to employ too short graft in pseudoarthrosis.

E. PERMAN, STOCKHOLM:

**SPLINTS FOR THE HAND AND FOREARM AND OTHER
BRACES**

(Published in Sv. Läkartidningen 1932).

G. EDSTRÖM, GOTHENBURG:

**INFLUENCE OF HOUSING- AND WORKING
CONDITIONS ON THE DEVELOPMENT OF INFECTIOUS
ARTHRITIS**

(Published in Sv. Läkartidningen 1932).

SVEN KLÆR, COPENHAGEN:

**DEMONSTRATION OF ABDUCTION-SPLINT FOR THE
UPPER ARM, WITH SOME REMARKS ON THE
TREATMENT OF PERIARTHROITIS HUMERO-
SCAPULARIS**

(An account of the work carried out in Denmark for the promotion of the prophylactic use of abduction-splints for lesions and contusions of the shoulder region in the case of patients above the age of 30).

After the publication of the *Accident-Insurance Year Book* for 1931 and of booklets issued by a firm of instrument makers of Copenhagen it was found possible to awaken the interest of

physicians in the matter — of those in the country-districts especially, abduction-splints being lent in large numbers from the stock of the instrument makers already referred to.

After a number of experiments, the American abduction-splint made by *Zimmer* was adopted as the standard model, satisfying, as it does, all the demands that can be made of such a splint. 1) It is light and can, without any inconvenience be fastened to the patient outside the clothes; 2) it fits on both sides; 3) the arm can be adjusted at an angle of from 15° to 20° in the frontal plane, and can be gradually abducted from 30° to 90° and placed in a suitable rotation-position; 4) the cost of hiring such a splint is but minimal.

The *Cripples' Hospital in Copenhagen*, has made special use of the splint for graded redressment treatment of cases of periarthrosis humero-scapularis which had not become better in spite of lengthy (3—11 months' physiurgic treatment).

During the last year and a half, there have been treated 8 non-complicated cases (6 men, 2 women; all patients above 40 years of age).

Duration of treatment: from 1 to 5 months.

Result: Five cases completely cured, without invalidity. In three instances, there remained an invalidity of from 5 to 8 per cent.; but as invalidity in respect to orthopedic treatment may be placed at 15 to 18 per cent., the result is nevertheless fairly satisfactory.

Technic of the treatment: The arm is laid on the splint with an abduction of 30° and medium rotation. During the course of the following fortnight, the abduction and rotation are gradually increased. After a few days the patient feels his arm at ease and begins active rotation exercises within the splint, which is worn day and night. From the beginning of the third week the splint is removed for one hour, with a gradual increase in the time. There follows a brief period of increasing pain, and of difficulty in performing rotation movements. Such attacks are easily relieved by appropriate electric treatment. (longitudinal galvanisation: 20—30 MA, for $\frac{1}{2}$ to $\frac{3}{4}$ hour) or careful diathermic treatment. The latter treatment not infrequently

causes pain in cases of periarthroitis, and if this is the case, such treatment must at once be discontinued. About one month after the treatment has begun the splint can, as a rule, be left off altogether during the daytime, but is kept on at night until the arm can be moved freely.

The advantages of the treatment are:

- 1) Brisement forcé is avoided.
- 2) The treatment is lenient and can be carried out as ambulant treatment.
- 3) The treatment appears to be efficacious also in those cases which are refractory to physiurgic treatment.

The one disadvantage is perhaps that the treatment lasts somewhat longer than the weight-extension treatment in bed. *Jordan-Norath, M. & Unfallh. 1932. 39. 278).*

DISCUSSION:

H. Nilsonne, Stockholm.

At the Orthopedic Clinic in Stockholm, we have had a large number of cases of periarthrititis humero-scapularis. We have now for some time made use of a splint, of an American model, of a type much the same as that shown by Dr. *Kiær*. We carry out the treatment approximately in the way sketched by Dr. *Kiær*, but with the difference that, from the very beginning, we make use of functional movement-therapy simultaneously with the splint-treatment.

The difficulty does not consist in carrying out this treatment, but in getting hold of the cases calling for it in good time. Very frequently, such patients go for months receiving altogether worthless treatment in the form of medical massage and various forms of electrical therapy, so that, when the case at last comes to the Orthopedic Hospital, we very often discover a stone-hard adduction-contracture, which must be made mobile under narcosis.

A propaganda among physicians and hospital staffs for an early and sensible movement-therapy in these cases is a thing devoutly to be wished for.