COMPRESSION ARTHRODESIS OF THE ANKLE AND SHOULDER

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Success with arthrodesis of the knee by compression (Charnley 1948) has now prompted the writer to describe his experiences with compression arthrodesis in the ankle and shoulder.

The application of compression to arthrodesis of the ankle and shoulder is more difficult than it is in the knee, and the writer does not wish to minimise the fact that the methods to be described perhaps demand a little more mechanical aptitude than is necessary in most orthopaedic procedures; on this account there may be some who will deplore any tendency to complicate operative procedures, in the belief that all the great operations of surgery are essentially simple. But practically all the classical operations of surgery have now been explored and, unless some revolutionary discovery is made which will put the control of osteogenesis in the surgeon's power, no great advance is likely to come from modifications of their detail.

For the same reason the elaboration of techniques which depend on bone grafting would also seem to have a restricted future, with the exception of a few instances, notably that of the Brittain operation in the hip, where the function of the graft seems to be in harmony with some natural trend in the architecture of the skeleton. Experience with the tibial graft during a quarter of a century, following the pioneer work of Albee in the shaping and fixing of this graft, has shown that the fate of cortical bone is unpredictable; these grafts sometimes fail to unite, sometimes fracture after union, sometimes fail to heal when fractured, and at all times are slow to become incorporated. In the same way cancellous bone has not shown any phenomenal ability to bridge the moving zone of a joint line either by itself or when its lack of rigidity has been supplemented by metallic internal fixation.

Until recently the idea has been prevalent that an autogenous bone-graft was " osteogenic "; but further experience has now made it obvious that the osteogenic powers of a bone graft are almost non-existent and that osteogenesis is a property only of the living bone of the host.

In compression arthrodesis direct union is achieved between the living bones forming the joint surfaces without the intervention of an inert graft. One of the effects of compression is to eliminate all shearing strains as well as preventing a gap between the cut bone surfaces. Under these conditions the healing of a compression arthrodesis is more aptly compared to the healing of an accurately coapted skin wound than to the union of a displaced fracture with the production of callus.

Technical researches in compression arthrodesis make it inevitable that operative procedures will become more complicated; but with surgeons specially trained to this at an early part of their career, and with the protection now afforded by antibiotics, elaborate techniques will offer no danger in the hands of the orthopaedic surgeon of the future, provided that sufficient attention is paid to the minutiae of the technique. For this reason the technical procedures have been described here in minute detail to emphasize the fact that the time is coming when no surgeon will embark on a new procedure with only a general knowledge of the principle and in the hope of himself improvising the details.

ARTHRODESIS OF THE ANKLE

In order to gain free access to the upper surface of the talus and the lower surface of the tibia, so as to shape them into plane surfaces which can be exactly coapted under compression, the approach advocated here may, at first sight, seem unnecessarily destructive; but before