

7518 P

Osteogenic Power of Tibial Periosteum.

H. C. FANG, Y. K. YUAN, AND LEO J. MILTNER.

From the Division of Orthopedic Surgery, Department of Surgery, Peiping Union Medical College.

In previous experiments¹ it was shown that a great difference exists in the osteogenic power of the periosteum of the rib and tibia of the same animal. Periosteum from only the mid-portions of these bones was tested. In the present experiments, specimens of periosteum of various portions of the tibia were compared with each other in this respect.

Rabbits, 6 to 12 months old, and adult dogs were used, in 3 groups. In each animal, equal strips of bone-free periosteum were aseptically removed from different parts of the bone's antero-medial aspect and laid upon the fascia of the corresponding tibialis anticus muscle. After 5½ to 10 weeks, the specimens were removed and examined for the extent of osteogenesis.

Group 1, 4 rabbits. The specimens were from the upper and lower thirds of the shaft of the tibia. New bone formed in both, but it was about 5 times more abundant in the specimen from the upper third. In each case, the end of the graft originally nearer the epiphysis had more bone than the other.

Group 2, one rabbit and 2 dogs. The specimens were from the upper, middle, and lower thirds of the bone. Those from the middle third developed no bone; and the others behaved as in group 1.

Group 3, 2 dogs and 2 rabbits. The grafts were from the upper third and from the junction of the middle and lower thirds of the shaft of tibia. The positions of the transplantations were reversed (in order to control the factor of possible differences in vascularity of different parts of the tibialis anticus muscle fascia). The transplants from the upper third of the shaft showed solid sheets of bone, while those from the junction of the middle and lower thirds of the shaft showed only a very slight amount of osteogenesis—slightly less than that formed in the grafts taken from the lower one-third of the shaft as in groups 1 and 2.

These experiments show that free grafts of periosteum from the upper third of the shaft of the tibia have a very marked capacity for forming new bone, that those from the lower third are the next

¹ Fang, H. C., and Miltner, L. J., *Proc. Soc. Exp. Biol. and Med.*, 1933, **31**, 386.

most active, and that those from the middle third are the least active. Apparently, the nearer the source of the graft is to the epiphysis, upper or lower, the greater is the osteogenic power. The differences as to the site of implantation of the graft seemed to be unimportant in this respect.

Clinical observations on the rapidity of the repair of fractures (in man) in these different parts of the tibia correspond closely with the osteogenic power as shown in these experiments.

7519 P

Narrowing of Artery from Contraction of Experimentally Produced, Fibrous Capsule.

C. C. CHANG AND C. M. VAN ALLEN.

From the Department of Surgery, Peiping Union Medical College.

Previously the contractibility of capsules of young sterile fibrous tissue surrounding pulmonary lobes and intestinal segments, organs offering little resistance to the constriction, was studied;^{1, 2, 3} whereas the present work concerns the contractibility of such tissue about arterial segments, where far greater resistance occurs.

Fourteen arteries, femoral and carotid, in 6 dogs, were handled. Initial treatment in each case: Under aseptic precautions, a short length of the vessel was exposed by incision and loosely wrapped once around with light, close-woven, collodion-impregnated, silk cloth or with thin rubber dam. This material was 3 cm. long and just wide enough loosely to encircle the vessel; after application, its opposing edges were fastened together with silk sutures. The wound was closed. Seven to 105 days after operation, the vessel was removed *in toto*, injected first with lipiodol at arterial pressure for roentgenographic determination of the size of the lumen, and injected afterward with formalin for fixation and section.

Two of the wounds became infected and the specimens were rejected. In the other cases, the findings were as follows: The envelop, bathed in a little sero-fibrinous exudate, lay loosely about

¹ Van Allen, C. M., and Wang, T. T., *PROC. SOC. EXP. BIOL. AND MED.*, 1933, **30**, 812.

² Wolfe, J. J., Wang, T. T., and Van Allen, C. M., *J. Thoracic Surg.*, 1934, **3**, 300.

³ Van Allen, C. M., and Chao, Y. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **31**, 1242.