

IVORY DOWEL FOR PRESERVING THE FINGER IN A CASE OF ENCHONDROMA OF A PHALANX COMPLICATED BY FRACTURE.

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ENCHONDROMA affecting the long bones of the hand and foot is common, and in certain cases it is not surprising that fracture of the bones affected should readily occur, as the compact tissue covering the tumor becomes very thin and may break spontaneously or with slight violence. The case recorded herein is that of a fracture of the proximal phalanx of the index-finger of the right hand, in which the digit was preserved by first removing the enchondroma and then inserting an ivory peg in the centre of the shaft of the bone. A case such as this is usually treated by amputation; it is therefore worth recording the following history of a patient in whom the tumor was removed and firm union of the fracture secured. The necessary disability and deformity which result from amputation may be prevented in suitable cases by employing the method herein described.

W. E. S., age twenty-eight, an accountant, was stoking the furnace in his house when with slight violence he broke the proximal phalanx of the index-finger of the right hand. He states that from early childhood he had noticed a marked enlargement of the bone, which was quite painless and did not trouble him. Through this region the fracture had taken place. On examination one found a fusiform tumor occupying the entire shaft of the phalanx, and on manipulation one could readily elicit crepitus, the movement of one fragment upon another at the seat of fracture causing a considerable amount of pain. A diagnosis of enchondroma of the phalanx was made with fracture through the tumor. An X-ray picture was taken (Fig. 1),

and it showed that the fusiform tumor which occupied the centre of the shaft of the bone was covered over by an extremely thin layer of compact tissue, probably not more than a millimetre in thickness. It seemed little wonder that the bone should have broken. The patient was exceedingly anxious to save his index-finger and it was determined to make the attempt, but there seemed little prospect of getting firm union if one simply proceeded by gouging out the tumor and then applying external splints. An ivory peg was procured, 2.5 cm. long and 3 mm. thick, which was pointed at both ends. An incision was made along the radial side of the phalanx and the bone exposed at the seat of fracture. The tumor was removed by a curette, and then a longitudinal slit 4 mm. wide (Fig. 2) was made in the compact tissue of the distal fragment, by means of a Dahlgren's rongeur forceps, the ivory peg was inserted and firmly secured in the centre of the shaft of the bone, each sharp end being embedded in the cancellous tissue toward the articular extremities of the phalanx. The wound was then closed and a splint of plaster of Paris applied. Healing took place *per primam*. Firm union of the fracture followed, and subsequently the patient was able to use the finger in his work as accountant, a matter of no small importance to him. The functional result as to movement and utility was perfect and it was difficult to detect any abnormality at the seat of former trouble. The first X-ray picture (Fig. 1) reproduced herewith shows the condition at the time of operation; the second skiagram (Fig. 3) was taken two weeks subsequently, and the third (Fig. 4) fourteen weeks from the time of the break.

The tumor removed from the bone was subsequently examined, its histological structure was that of a typical enchondroma; no giant-cells were found. It belonged to the category of "central enchondroma," which according to Virchow developed from germinal cartilaginous tissue which had been displaced from the epiphyseal zone into the bone marrow of the diaphysis. Rickets seems to play a rôle in the development of some of these tumors, and Von Recklinghausen has attributed the disturbance in bone formation which gives rise to such growths to imperfect development of the blood-vessels with faulty nutrition as the result of imperfect vascular supply. Koch¹ believed that cysts which

¹ Koch: Arch. f. klin. Chir., 1902, Bd. lxxviii, Hft. 4.

occur from time to time in long bones frequently have their origin in an enchondroma, but Bloodgood² looks upon this as a rare etiological factor in such conditions. The X-ray picture in my patient might well suggest a bone cyst, but no such cystic formation was found.

The treatment of the bone after removal of the enchondroma naturally resolved itself into some attempt to restore the defect in the bone caused by the excavation of the growth, and to bring about repair of the fracture. From time to time various foreign substances have been introduced into bone cavities, such as decalcified bone chips, sterile catgut, blood-clot, normal saline solution, and the filling of Mosetig-Moorhof consisting of iodoform, spermaceti, and sesame oil. Beck's bismuth paste has also been used for such purposes. More recently the transplantation of bone from one part of the body to another has found favor, and for this purpose a piece of rib or a portion of the fibula has been utilized. A remarkable series of cases have lately been reported by Küttner,³ where he succeeded in transplanting large portions of bone (*e.g.*, the upper third of the femur) from the body of an individual recently dead to replace a similar portion of bone removed from a patient for tumor growth.

In the case recorded herewith ivory was used and proved quite suitable. The last X-ray picture taken 14 weeks after the operation shows a remarkable degree of condensation of the bone about the ivory peg, and in the same picture it will be observed that some slight degree of absorption of the piece of ivory has taken place. The advantage which may be claimed for ivory is that it is readily obtained and thorough asepsis can be secured in its introduction. Moreover where splinting is required, this may be attained as in my case by utilizing the piece of ivory for the purpose.

² Bloodgood: Trans. Am. Surg. Assoc., 1910, vol. xxviii, p. 154.

³ Küttner: Beit. z. klin. Chir., 1911, Bd. lxxv, Hft. 1 and 2, p. 1.