SPONTANEOUS FRACTURES OF THE CLAVICLE.

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THE mechanism of the various fractures of the clavicle is a subject of much interest, and of great practical importance to the surgeon in making the diagnosis of these injuries. I have already discussed this subject in this Section of the Academy in part, dealing at that time chiefly with fractures of the healthy bone.

I now submit some specimens which illustrate the behaviour of the clavicle when broken, as it is called, spontaneously:—"Spontaneous fractures, so called, are such as occur without any apparently adequate cause."* The causes that lead to this kind of fracture, in the skeleton in general, are inflammation, caries and necrosis, tubercle of bone, syphilis, hydatids, primary or secondary cancer, rickets of the child, rickets of the adult, and rickets of the aged.

I can, out of this category, show clavicles broken spontaneously in consequence of syphilis, cancer, and each of the varieties of rickets, and I am induced to bring this matter forward just now as I have recently obtained, for the first time, an example of the fracture of the clavicle caused by infantile rickets. I have also, this day, obtained a recent example of the fracture due to the rickets of the aged.

The causes which produce these injuries which are "not obviously adequate to the breaking of a sound bone," are, I think, muscular action, or the strain put on the bone by the

* Ashurst, Cyc. Vol. IV., p. 12. Packard.

weight of the body, or parts of it, in movement. If we look to cases of fracture of the normal clavicle, produced by muscular action, we find the site of the fracture is the middle third in most cases, in the remainder the inner third; it is also recorded that the epiphysis of the sternal end has been separated by muscular action.

These facts have some bearing on the mechanism of these injuries before us. Let us put aside the fractures due to cancer and the similar growths, for in these the fractures occur where the local disease grows. In the examples where the entire structure of the bone is affected, the fracturing force should develop its effect at a place in the bone similar to that of the healthy bone—for the strength of the bone is in all parts equally reduced. In the bones affected by syphilis, in the rickets of the child and of the adult, we see that the fractures are transverse lesions, seated in the middle or inner third of the bone, and we would naturally conclude that they resulted from muscular action alone. Of this specimen of adult rickets I know the history. The bone was broken three times in the same place, not by falls but by sudden exertion of the limb in the effort to catch a child in danger of falling.

In dealing with the fractured clavicle of rickets of childhood we rarely can get an account of the injury, but my experience is, that in this disease, if the clavicle breaks, the injury is in the inner or middle third of the bone, and by its angular deformity we recognise its transverse character. This specimen proves these details—and this cast was taken from an infant in whom both clavicles are so broken.

In the rickets of the aged the clavicle breaks between the conoid and trapezoid ligaments. I put this ghastly-looking skeleton, affected with the disease, before the section as the most graphic illustration of this fracture. I could show many such specimens, and one is this which came into

my hands to-day. On both sides of the skeleton the bone is broken, and one cannot see the relation of the fragments to the coracoid process without at once concluding that the injuries were produced by flexion of the bone over the coracoid, just as one would break a stick across his knee. In the case of the healthy bone we meet the fracture in this position, as the result of a fall or injury, in which the upper region of the shoulder and acromion process bears the shock. It is clear that the mechanism of the fractures is the same.

There is a great importance attached to these facts. In the child with rickets, and its peculiar fracture of the clavicle, the knowledge of the mechanism of the spontaneous fracture sets aside the blame so readily set down to the rough and careless handling of someone who had care of the child. In the rickets of adult life, and of the aged, the fracture of the clavicle is often the first of the long series of fractures that occur, and its presence should warn us to look for and rightly interpret the other symptoms which attend the disease. A knowledge of these facts will, too, render the surgeon very cautious in attaching blame to attendants in asylums for the aged, sane or insane, until the question of spontaneous fracture is set aside by conclusive evidence.