

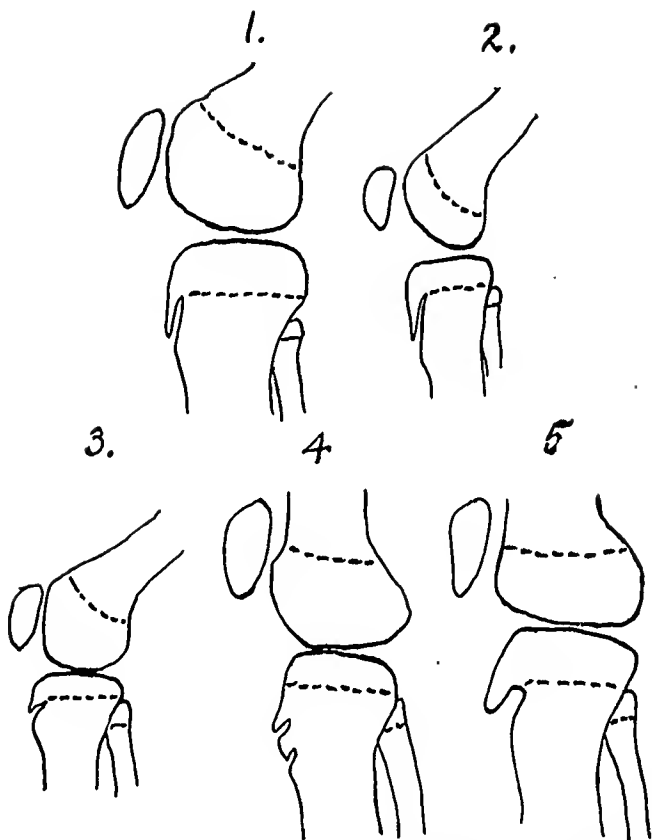
## SYMMETRICAL INFLAMMATION OF THE EPI- PHYSEAL BEAK OF THE TIBIA.

BY KENELM WINSLOW, M.D.,

OF SEATTLE, WASHINGTON.

THE use of the X-ray has given us a much more complete knowledge of the nature and appearance of bones during the period of ossification, and in no instance has it proved of more practical interest than in the study of the development of the upper tibial epiphysis. Dr. Joseph C. Bloodgood, of Johns Hopkins, was one of the first to call attention to this subject in reporting the work of Schlatter (*Beiträge zur klinischen Chirurgie*, 1903, Band xxxviii, p. 887) in the December number of *Progressive Medicine*, 1903, and through his kindness I have been able to read Schlatter's original article. In the development of the upper tibial epiphysis there are two separate centres of ossification for the production of the tubercle of the tibia. One centre is formed at the site of the lower portion of the tubercle (Plate I and Fig. 4), and the other centre develops as a peculiar beak-like process which projects downward from the upper epiphysis. This beak is separated from the lower centre of ossification of the tubercle by cartilage up to the eighteenth to twentieth year, when the two centres become merged into one bony tubercle as it is seen in adult life. The lower centre of ossification of the tubercle does not appear until the twelfth year, and in Plate I, which was taken for the writer, of a healthy boy's tibia of twelve and one-half years, this lower centre is conspicuously evident.

Ludloff (*Ibid.*, p. 65) has also made a study of the development of the tibial epiphysis and the beak-shaped process, which will be discussed by Bloodgood in *Progressive Medicine* for December, 1904. Figs. 1 and 2 show normal tibiae at the age of twelve, with the beak-like process of the upper tibial epiphysis; while in Figs. 3 and 4 are shown two centres of ossi-



FIGS. 1-5, showing outline in profile of knee-joints from skiagrams. Fig. 1 (after Schlatter), normal appearance of upper tibial epiphysis, and the same is seen in Fig. 2 (after Ludloff), at the age of twelve. Fig. 3 (after Ludloff), at age of fifteen exhibits both the beak-like process and the lower centre of ossification for the tubercle of the tibia in a healthy subject. Fig. 4 gives an outline of both centres of ossification somewhat different but normal. Fig. 5 (after Schlatter) illustrates dislocation of the beak-like upper centre of ossification forward, with separation of the cartilage between the two centres and enlargement of the beak from callous formation (boy of thirteen).

PLATE I.



Normal boy of twelve and one-half years; shows epiphyses and notably the lower centre of ossification of the tubercle. The beak-shaped upper centre of ossification for the tubercle is but faintly discernible.

fication of the tubercle, the upper beak-shaped process, and the lower centre of ossification projecting beneath it.

Schlatter's article refers to twelve cases following local injury to the knee-joints. In them pain, swelling, and tenderness over the head of the tibia were predominant, and not infrequently persisted for months, and even for two years, in one instance, and such cases are likely to be mistaken for traumatic arthritis in recent injuries, or for pyogenic or tuberculous osteomyelitis or new growth in more chronic conditions. X-ray examinations proved that Schlatter's cases resulted from dislocation of the centres of ossification of the tibial tubercle (Fig. 5), and when seen early, rest in bed, with fixation of the limb for two or three weeks, was usually sufficient to give relief from the trouble.

Schlatter found that in cases of long standing, while the disappearance of symptoms following this treatment was generally considerably delayed, yet it was safe to assure the patient of an ultimate favorable termination.

The foregoing premise is requisite to an understanding of the case herein reported, which seemingly simulates closely Schlatter's cases, although apparently differing from them in some minor respects.

May, 1904. Patient, a boy of fourteen years, with the following history: Family history good. Personal history irrelevant, except for scarlet fever in infancy. Two and one-half years ago he was attacked suddenly with fever, sore throat, and developed a rash upon the chest which was visible for but a few hours. Immediately after this there were pain and swelling in the joints, and weakness and irregularity in the heart's action, palpitation and dyspnoea, and a mitral murmur which persisted for nearly two years. The medical attendant at this time regarded the case as one of scarlet fever, but from the description and subsequent course of events, and the previous history of scarlet fever, it would seem as if a diagnosis of acute rheumatism might have been not improbable.

However this may have been, the boy was brought to me at the above date for trouble about the knees which did not com-

monly cause pain, but the knees were said to frequently "give way" and were very "sore." At this time there had been no pain or swelling in the joints for a considerable period, perhaps a year or more, and the heart difficulty had greatly improved.

The boy was thin but healthy looking, tall, and growing rapidly. Careful physical examination revealed nothing abnormal in the chest or abdomen except a movable kidney, from which his mother is a sufferer. The heart was apparently normal in size and position, and its sounds were clear, strong, and regular. On the anterior aspect of the upper epiphysis of each tibia there was a protuberance which, when seen from the side, bulged forward almost as far as the knee-pan above, and, although reaching up close to the lower border of the knee-joint, it did not invade the joint nor was the joint in any way affected.

These swellings or tumors were very tender, somewhat abnormally warm to the touch, and of bony hardness, but the skin was not reddened. They gave no pain during motion or rest, unless the joint was violently jarred, or acutely flexed so as to bring great tension to bear upon the ligamentum patellæ which was attached to the inflamed area. The general bodily temperature was invariably found normal. The duration of the swellings was a matter of doubt; they were not present when I examined the boy some months previous.

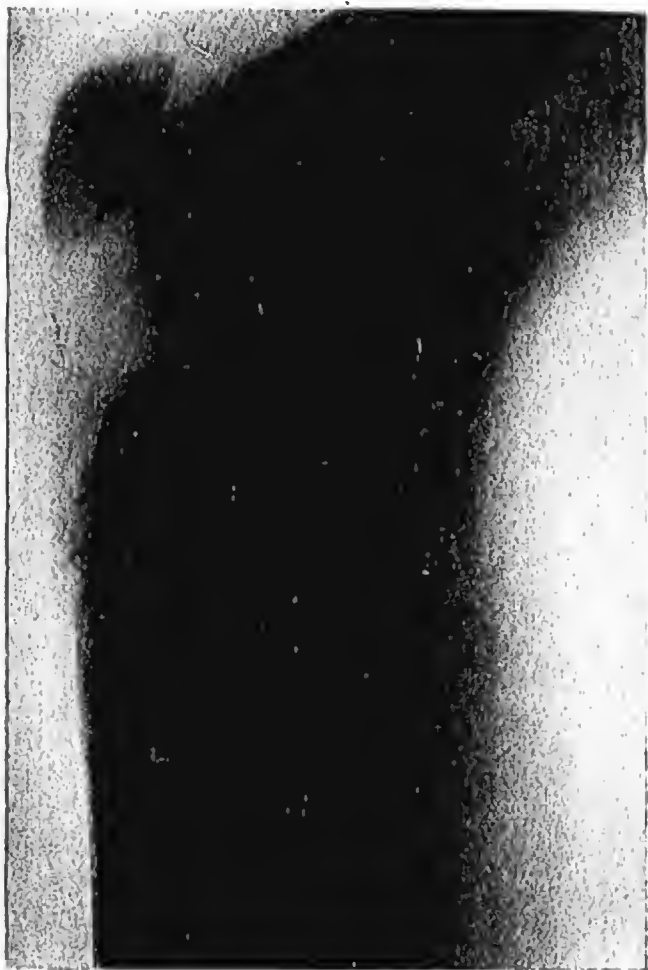
The two swellings were nearly identical one with the other. No history of traumatism could be discovered, but is it possible to eliminate traumatism in a boy? An X-ray examination revealed an erosion of the beak-like process of the upper tibial epiphysis of both legs, suggesting a rarefying osteitis associated with an ossifying periostitis (Plates II and III). In endeavoring to form a differential diagnosis, the following conditions were considered: an infectious or tuberculous osteitis or osteomyelitis, new growths, and traumatic inflammation of bone. Dr. Bloodgood, who was consulted by mail, brought to my notice Schlatter's cases and, to solve the diagnosis, advised operation. The absence of fever was unfavorable to the diagnosis of either infectious or tuberculous disease, and the existence of new growth was rendered unlikely on account of the bilateral character of the swellings. The use of tuberculin was considered, but was thought inadvisable as operation seemed indicated, and this, it was believed, would clear away the difficulties in diagnosis.

PLATE II.



Outline of right knee-joint of case reported displaying erosion of the epiphyseal beak and of parts just beneath.

**PLATE III.**



**View of left knee-joint of case reported above. Erosion of epiphyseal beak of tibia, but not so clearly defined as in Plate II.**

Rheumatoid arthritis was suggested, but the existing affection was clearly a bone disease, and did not at any time involve the joints.

After rest in bed, with fixation of the limbs on splints had been tried for a month, together with various other measures, as external applications of heat and cold, counterirritants, actual cautery, etc., without avail, the boy came to operation July 9, 1904. At operation there was found an area of softened, spongy, and much infected bone, perhaps as large as a silver quarter-dollar, covered with greatly thickened periosteum under the seat of each external protuberance at the head of the tibia. The softened diseased bone was scraped away to a depth of perhaps one-third of an inch and the periosteum and skin were approximated without drainage. There was no suggestion of any suppurative process. The wounds healed well without infection. Cultures taken from the scrapings proved sterile, and an emulsion of the same injected several times intraperitoneally into a rabbit gave a negative result. The scrapings did not afford suitable material for sectioning. The net result of the operation, therefore, was disappointing from a purely scientific stand-point in not elucidating the etiology of the inflammatory process.

Practically, however, the operation was a decided success. After the lapse of three weeks the patient began to go about, and a few weeks later there was a subsidence of tenderness and swelling, and the patient is now well. I am unfortunately unable to present a skiagram taken since recovery.

Some concluding remarks may not be amiss concerning this comparatively unusual condition. Apart from its injuries or diseases, the development of the tibial epiphysis is extremely interesting.

Gray says that one centre for the upper epiphysis appears at birth, and that there is formed from it a thin, tongue-shaped process in front which makes the tubercle, and adds that an additional centre occasionally exists for the tubercle. Schlatter, in his clinical studies, and Ludloff, in his investigations concerning the development of bones entering into the knee-joint, have determined the existence of two centres for the tubercle and their peculiar appearance seen in profile by means of the X-ray.



General skiagraphic work has brought to light the greater frequency of finer epiphyseal injuries, heretofore unknown; as for example, epiphyseal separation of the epicondyle or partial fracture of the lower epiphysis of the humerus; and it is not surprising that such a prominent and exposed epiphyseal surface, and therefore one so liable to violence, as that of the head of the tibia should suffer injury. Nor would it be unexpected for such injury to produce more than a single pathological state. So that what might be called Schlatter's disease, a condition described above and due to injury of the epiphyseal tubercle-centres of ossification, might fairly include a local osteitis in its pathology as well as fracture and partial dislocation of the ossifying centres.

A case not greatly dissimilar to Schlatter's is herein described, and, while it differs in certain particulars from his, it may broadly and not unscientifically be classed with them. The absence of a history of traumatism may be disregarded in the instance of an active, playing boy. The skiagrams, however, appear to unmistakably denote an inflammatory lesion about the tubercle-centres in my case, while there seems to be no dislocation of the centres or callous formation, as in Schlatter's cases, and the bilateral symmetry is not common to his.

In other words, the case described resembled Schlatter's in its clinical features, and, while there was no actual evidence of traumatism or dislocation of the tubercle-centres, yet it is not improbable that some slight injury, with or without a latent infection (as from that occurring two and one-half years before), had produced an inflammation of the tubercle-centres of ossification.\*

---

\* Since writing the above, the article by Ware, of New York, on Fracture of the Tibial Tubercle, has appeared in the November ANNALS OF SURGERY for 1904. Also the following references bear upon the general subject:

O'Donoghue. Avulsion of the Tibial Tubercle. Boston Medical and Surgical Journal, June 11, 1903.

Osgood. Lesions of the Tibial Tubercle occurring during Adolescence. Boston Medical and Surgical Journal, Vol. cxlviii, No. 5.

Poland. Traumatic Separation of the Epiphyses, 1901.