

distortion of the axis of the limb may seem. The worst possible mistake would be to entirely overlook a dislocation or fracture hidden by excessive swelling, and to call the injury traumatic gonitis. If you are called upon to see such a case, examine thoroughly.

## CHAPTER XXXIII

### INFLAMMATORY SWELLINGS OF THE KNEE-JOINT

IN dealing with *inflammatory processes* of the knee-joint, we will take a case of acute EFFUSION INTO THE JOINT as an example, and with this as a basis discuss the symptoms which arise and the method of proving the effusion to be intra-articular. If a hole is bored into the patella of a cadaver and fluid introduced into the joint through a cannula, a peculiar phenomenon is noticed. The patella is floated upward, the whole region about the knee-joint appears swollen, and the leg assumes a certain well-defined posture. The patella is merely raised by the fluid, which accumulates between it and the lower end of the femur. The position of the leg is due to the tension of a particular portion of the capsule. The outline of the distended joint indicates the extent of the synovial sac filled with fluid, and its shape is characteristic. In the normal state, the well-known grooves situated to either side of the patella can readily be seen; they disappear in the distended joint, and the outline of the patella simultaneously grows indistinct. Above the patella a swelling also appears, and extends upward upon the femur for two to three inches. The boundary of the swelling has its convexity directed upward. This increase in size above the patella owes its origin to a recess of the

synovial membrane, which lies beneath the quadriceps tendon, and communicates below by an opening of large size with the main portion of the joint cavity. All these factors serve to give the neighbourhood of the knee-joint its rounded, spherical shape. During life the process is exactly identical when an acute effusion into the joint takes place. The extremity then assumes a position of moderate flexion, and the outline of the joint is of the above-mentioned variety. The spherical swelling shows fluctuation above and to either side of the patella, and this fluctuation is transmitted to all portions of the joint. The result is the so-called *dancing patella* (*ballottement*)—i. e., the patella may be depressed till it touches the femur, when it immediately rebounds.

A serous effusion into the knee-joint of traumatic origin is the result of severe sprains and contusions. Rheumatic gonitis occurs spontaneously, is accompanied by severe pain, and frequently by fever. Often other joints are similarly affected. If the pain is severe, and limited to the knee-joint, and especially if the joint is markedly rigid, *gonorrhoeic gonitis* must not be forgotten. Therefore, examine the genitals.

Exudation into the knee-joint may, however, occur slowly and insidiously from various causes. In some cases the etiological factor is a mild, rheumatic infection, in others a tuberculous process sets in with symptoms of an exudative synovitis. Arthritis deformans may at the outset manifest itself merely by a slight effusion. If the individual is cursed with a tubercular family history, and if symptoms of tuberculosis are evident in other portions of the body, the prognosis of the case must be regarded as more serious—i. e.,

as a tubercular process—and in the further treatment this fact must be kept in view. An arthritis deformans will unmask itself during its further course by the grating sounds heard on motion, combined with thickening of the capsule, most noticeable at its upper margin. This trouble, although it causes but little discomfort, is also distinguished by its stubborn persistence. In a marked case, the capsule is enormously distended in the course of years; the grating sounds are loud and evident; pain is slight, and contractures fail to appear.

Let us assume that the swelling unquestionably corresponds in its extent and outline to the joint capsule, but that floating patella is completely wanting. In this

case the exudate can not be of fluid consistence. But, as the form of the swelling points to the capsule, we are not dealing with a distention by fluid, but a capsular swelling resulting from newly formed tissue increase. This is often due to TUBERCULOSIS. The process is characterized by a growth of young connective tissue about the capsule and granulation tissue which encroaches upon the joint. The capsule and ligaments are incorporated and replaced by this new material;

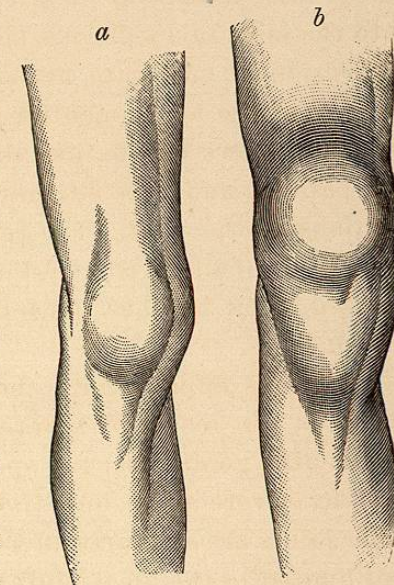


FIG. 52.—Anterior view of knee-joint: (a) in the normal condition; b, joint distended by large effusion.

the cartilages and bones are invaded; tubercles are formed. Areas break down into pus, point, and discharge so that fistulous tracts lead into the joint. The outcome is the so-called caries of the knee-joint. After fistulæ have developed, crepitation, abnormal mobility, etc., can be demonstrated, and the condition is unmistakable. Before this stage, however, the condition should be recognised. The individual is of phthisical habitus; the knee can not be completely extended; its anterior surface is spherical and rounded, but fluctuation can not be distinctly obtained. The swelling has a soft, pasty consistence, due to the new-formed tissue; the skin is pale and somewhat shiny. Pain is variable, but abnormal lateral mobility is an early symptom. Absence of effusion in a joint which shows a rounded outline and lateral mobility, combined with the peculiar consistence just mentioned, as the chief symptoms, is typical of a destructive process, starting either in the epiphysis or, even more frequently, in the capsule.

In children, the primary focus is more often situated in the bone. The process may then heal without advancing to a suppurative stage. The knee-joint is swollen, but not in the same manner as when the joint cavity is distended. Next to the patella, and somewhat below it, are two small elastic welts. The upper recess is not distended, the patella does not float, for there is no effusion. The pathognomonic posture is assumed early in the disease, contractures result, and the muscles of the leg rapidly atrophy.

Sometimes the fungous proliferation is accompanied by a rapid intra-articular formation of pus—the so-called cold abscess.

Occasionally the beginner finds it difficult to deter-

mine the nature of swellings which appear at the knee-joint. Such are the *neoplastic tumours* of the lower end of the femur—sarcomata and osteochondromata. Myelogenous sarcomata are particularly apt to mislead, because they occasion severe pain in the knee, and produce an apparent loosening of the ligamentous structures. These symptoms appear to be due to an inflammatory process, especially the last-mentioned symptom, which seems to be a relaxation of the ligaments as a result of fungous processes. This laxity is only simulated. In extension the leg can be adducted and abducted more than the normal, but the motion takes place not in the knee-joint but in the sarcomatous mass, which has eroded the femur. Pain is not a reliable symptom. In the case of myelogenous tumours, it is readily understood that the pain may be severe and not diminished by rest. In order not to go wrong in such a case, other signs must be taken into consideration. Most important is the fact that in these new growths the characteristic position of flexion, which is never wanting in painful inflammatory processes, does not appear. The swelling produced by the bone tumours has a peculiar consistence. In none of the above-mentioned exudative processes (including among them the fungous invasion of the capsule) was the swelling hard; in sarcomata, isolated spots are softer, but others are positively hard. Myelogenous sarcomata may show parchment crackling in spots—a symptom due to a thinned-out, bony lamella covering the tumour mass. If present, it removes all doubts.

Just as in all other joints, it must not be forgotten that an acute swelling of the knee-joint may be the first symptom of an idiopathic *osteomyelitis* of the lower

end of the femur or upper end of the tibia. The high fever, typhoid state, widespread œdema, the severe, boring pain, and especially the fact that particular spots on the bone are most tender to pressure, serve to distinguish the condition from acute articular rheumatism. When the symptoms of pus formation are noticed our last doubts are dispelled, for in rheumatism the process never advances to suppuration.

A striking picture is afforded by the arthritis sometimes seen in the course of *tuberculosis*. The joint is much swollen, the joint cavity distended by a massive exudate, the femur considerably thickened (in the prepared specimen showing bony deposits). This thickening may extend to the middle of the femur. In the joint, loud cracking and creaking may be elicited, as if large pieces of bone lay free within the cavity. The joint has lost all of its firmness; it is loose, and at times shows a truly surprising lateral mobility. The patient uses the joint without a trace of pain. In addition, the usual signs of *tuberculosis* are found.

It may be mentioned here that analogous changes also occur in the ankle-joint.

It ought no longer be difficult to diagnose *periarticular* swellings about the knee-joint. *Prepatellar bursitis* requires but casual mention. A strictly circumscribed, elastic, tense swelling directly in front of the patella is characteristic. A deep-seated *abscess in the popliteal space* is not as readily recognised. It may be due to suppuration of the subfascial tissues or to suppuration of a lymph gland, frequently found in this region. The joint is flexed, but *anteriorly* there is no exudation into the joint; the bones are not enlarged; tenderness is wanting. Only the popliteal space is fuller, tense,

and very sensitive. Soon the skin becomes dusky red, and fluctuation can be obtained. In scrofulous children and phthisical adults cold abscesses (extra-articular) occur at the internal condyle. Their extra-articular situation may be recognised by their circumscribed shape, the normal contour of the rest of the region of the knee-joint, and the absence of floating patella, in spite of the fluctuation noticed over the abscess itself.