

A FURTHER CASE OF BRODIE'S
ABSCESS SIMULATING TUBERCULOSIS OR CHRONIC
SEPTIC OSTEOMYELITIS

BY
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In Acta Orthop. Scand. vol. XVI, fasc. 2-3, pp. 180-193 I have described 5 cases of Brodie's abscess. As Brodie's abscess is apt to be confused with tuberculous osteitis or, in some instances, with chronic septic osteomyelitis, and as I have recently had under treatment a case which has given rise to such confusion, I propose to report this case also.

The patient was a 7 year-old Finnish girl (record No. KT 36/47), admitted on 17/2/1947, diagnosis, tuberculous osteomyelitis.

The mother had died of tuberculosis a few months after the birth of the patient. The patient is stated to have suffered, in 1943, from cutaneous lesions suggesting erythema nodosum.

The patient was taken ill on 18/8/1946, with pyrexia of 40 degrees C., pain and swelling in the left knee. Two days later swelling and pain in the right leg below the knee. X-ray at first negative, leading apparently to the supposition that this was a case of polyarthrititis. The blood count showed reds, 4,130,000, whites, 11,200. Sedimentation rate, 60 mm.

The girl had been hospitalized as a diphtheria carrier at the Finland Home in Djursholm and subsequently at the Stockholm Fever Hospital. On 28/1/1947 she developed measles. Afterwards there appeared on the right leg below the knee an ulcer or sinus with slight discharge.

The following x-ray findings were reported immediately prior to admission :—

Left leg: Typical tuberculous process involving the epiphysis and upper portion of the metaphysis of the tibia. Extensive infiltration of the soft tissues immediately below the knee, with an irregularly-shaped sequestrum about 4 cm. below the knee and 1 or 2 cm. in front of and lateral to the tibia.—*Right leg:* Extensive tuberculous lesions within the

lower portion of the tibial diaphysis and metaphysis. Perforation of the cortical bone in the median line about 5 cm. above the anterior aspect of the ankle. Here also a small sequestrum. Moderate infiltration of the anterior soft tissues at this level.—*Lungs*: In the left infraclavicular region, there are some small streaks of increased radiodensity. Possibly

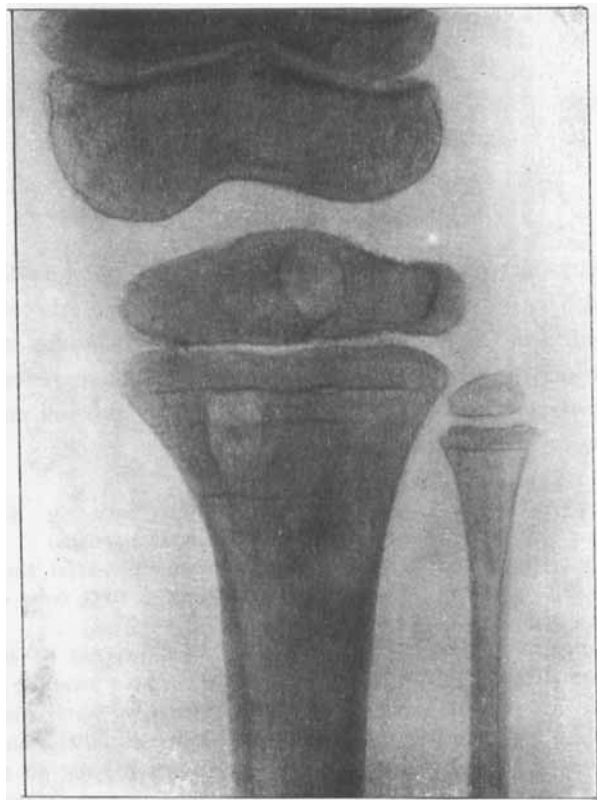


Fig. 1

small calcified focus in the left hilus. Otherwise no pulmonary or pleural shadows. *Abdomen, scout film*: Nothing abnormal. No increased amount of fluid in the peritoneal cavity. No appreciable glandular calcification.

Tuberculin test, positive.

Findings on admission 11/2 1947: Heart and lungs, N.A.D. Left knee somewhat swollen, motility unimpaired, no pain on movements. Lateral pressure on the patella entails crepitation. Immediately below the tibial condylus, there is a median abscess slightly larger in size than a walnut.

The tibial aspect of the right leg, viz. the area immediately above the malleolus, is the site of a livid ulcer of thumbnail size. The underlying bone shows an increase in bulk and is somewhat tender, as it usually is in cases of chronic septic osteomyelitis. The motility of the ankle joint is not impaired.

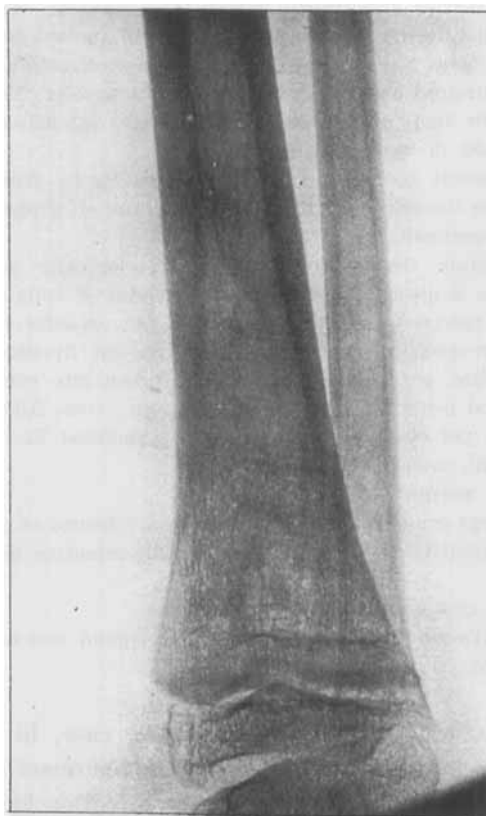


Fig. 2

Operation on 5/3/1947: Curettage of sinus and bone abscess in general anaesthesia (ethyl chloride and ether). The sinus in the right leg below the knee is opened and the bone exposed. This discloses a small cavity in the bone, filled with granulations. The latter are curetted and forwarded for examination. There is no free pus to be found.—In the left leg below the knee a curved incision is made around the subcutaneous abscess. The abscess is opened and found to contain purulent fluid and

mucous matter. A branch of the abscess extends towards the median aspect of the tibia, but no exposed bone is revealed. The periosteum is incised and removed from a large area of bone in the vicinity of the median tibial condylus. On opening the bone a cavity scarcely as large as a hazel-nut is exposed. This cavity contains pus, and its walls are covered with fibrous tissue, which is curetted. The abscess has pervaded the epiphysal border and spread within the epiphysis, where a similar somewhat smaller cavity is found. In the tibial metaphysis the median portion of the bone is perforated in a posterior direction. The cavities are carefully curetted and filled with penicillin powder. They are found to contain a few small sequestra, which are also extracted. Suture. The legs are replaced in their plaster casts.

Patho-anatomical findings: (I) Granulation tissue from right tibia. (II) Granulation tissue from left tibia. Staphylococcal growth was obtained from each specimen.

The granulation tissue proved to be histologically non-specific. A peculiar feature is nevertheless the ample amount of cells containing fat in the second specimen. Such intracellular fat deposits may be noted in cases of non-specific chronic osteomyelitis, but lipoidosis (Schüller-Christian's disease, etc.) should perhaps be taken into consideration.

Another blood count showed, Hb. 65 per cent; reds, 3,600,000; whites, 7,100; eosins. 4 per cent, stabs. 5 per cent, segmented 72 per cent, lymphos. 18 per cent, monos. 1 per cent.

Skull x-ray, normal.

From both legs growths in pure culture was obtained of yellow haemolytic coagulase-positive staphylococcus, penicillin-sensitive but sulphathiazole-resistant.

Total serum cholesterol. 150 mgm. per cent.

Gruber-Widal's reactions for typhoid, paratyphoid and undulant fever (Bang), negative.

A distinguishing feature of the above case, in comparison with the 5 previously described, is the sudden onset of the knee-joint symptoms without any precursory infection being demonstrable. It should be borne in mind that the patient spoke nothing but Finnish, and that her mother was dead, making it difficult to obtain a detailed history of the case. Five months after the patient had had measles, there gradually developed small inflammatory foci immediately below the left knee and above the right ankle joint respectively. Contrary to the other cases previously reported by me, here not only one but two areas were affected, both below the knee. Characteristic of the

focus in the left leg was its appearance and site in the condylar region. The focus presented a fairly typical aspect and its principal portion was situated on the diaphysis side of the epiphysial border, i.e. in the metaphysis, while the remainder was situated within the epiphysis (Fig. 1). The clinical findings suggested that the focus had developed in the metaphysis or diaphysis, especially as the motility of the knee joint was unimpaired, and since the latter was scarcely swollen or seemed to be affected by the process. The focus in the right leg immediately above the ankle joint was obviously lying completely within the metaphysis or diaphysis and in type resembled non-specific acute osteomyelitis with sinus formation. Closer examination of the radiograms, however, revealed traces of wedge-shaped shadows extending down towards the epiphysial border (Fig. 2). Curiously enough, there was but slight discharge from the sinus. The infection appeared to be a very mild one, and the patient's condition was unimpaired and apyretic. Sedimentation rate, 40 mm. Mantoux test, positive.

The operation revealed, as is usual in such cases, muco-sero-purulent fluid, small sequestra and yellow haemolytic staphylococcus. Healing took place rapidly after the operation. As there was purulent discharge from the knee wound and the organisms were penicillin-sensitive, penicillin was also administered, which perhaps accelerated healing. The knee and ankle joints were encased in plaster casts. After the purulent discharge had persisted for a few days the wounds healed under the crusts.

It is often difficult to differentiate clinically between Brodie's abscess and tuberculous osteitis, and sometimes also between the former and common septic osteomyelitis. From tuberculous osteitis Brodie's abscess can be distinguished by its site. It does, as a rule, lie in the metaphysis but may, as in the above case, pervade the epiphysial border and produce a focus in the epiphysis. Hereby the joint is usually not involved, as it is in tuberculosis. The joint capsule is not as a rule affected, but should it be, the inflammation will practically always subside after removal of the focus (see my Case No. 3).

In examining the radiograms, special attention should be paid to the site of the lesion. If this is situated within the metaphysis, viz. on the diaphysis side of the epiphysial border, Brodie's abscess should be very strongly suspected even though an epiphysial focus be present and the patient be tuberculin-positive. On evacuation of the focus septic organisms will be demonstrated in the majority of instances, and—which is an important matter from the therapeutical point of view—cure is as a rule more quickly brought about than where the process is tuberculous, the joint symptoms, if any, rapidly subsiding. If there are joint symptoms in cases of tuberculosis, and if the capsule is affected, the injury to the joint will generally be a permanent one.

Differentiation between Brodie's abscess and common septic osteomyelitis is not as a rule difficult, as the latter is a more extensive process that produces signs of more acute irritation, such as large periosteal new bone deposits, etc., and since the course of disease is continuous. In the case here recorded the changes in the lower portion of the right tibia were so extensive and associated with such signs of irritation that it was fairly natural to suspect chronic septic osteomyelitis. As, however, the process in the left tibia presented a typical aspect and the same organism was cultured from both foci, which had developed simultaneously, the inference was justified that both were Brodie's abscesses.

The post-operative course also points to Brodie's abscess. After evacuation each lesion healed rapidly. More time is usually required for chronic septic osteomyelitis, especially in those cases where it is not feasible to remove larger osseous sequestra at operation. In this particular case penicillin had been used after evacuation, perhaps accelerating healing, which initially, however, was accompanied by suppuration. In my previous Case No. 5 the purulent discharge persisted for quite some time during the post-operative course, but the diagnosis of Brodie's abscess could not be doubted there either.

The suspicion of Schüller-Christian's disease as suggested by the pathologist in view of the ample amount of fat-loaded cells,

cannot be entertained on account of the bacteriological findings, the blood counts and the serum cholesterol rate.

Conceivably Brodie's abscess might be cured without surgical treatment, viz. by penicillin administration alone. In my opinion, however, it is safer to evacuate the focus by surgery. The procedure involved is generally so restricted that it entails but little discomfort to the patient, and healing proceeds rapidly and securely even without the aid of penicillin.

Finally, I propose to summarize the experience derived from the 5 cases previously recorded and that now dealt with, as follows:—

SUMMARY

In a preceding paper published in *Acta Orthop. Scand.* vol. XVI, fasc. 2-3, pp. 180-193, I have referred to the typical symptoms of bone abscesses according to Brodie's own description and to the subsequent literature on the subject, and have quoted statistics compiled by Brailsford in 1938 on the basis of 62 cases, where it is shown that the site most commonly affected is the tibia. This is also corroborated by statistics for the period 1930-1945 from the X-ray Department of St. Göran's Hospital covering 16 cases in all, in 14 of which the site of the process was the tibia.

I have previously described 5 cases in detail, and now 1 additional case of Brodie's abscess in the present paper, these cases having been admitted to the Orthopaedic Department during the last 3 years. The last case exhibited the process in both tibiae. These cases evidence the low-grade virulence of the invading organisms, and that a very careful study of the radiograms is essential, especially as regards the position of the focus in relation to the epiphysial border. On the diaphysis side of the epiphysial border is a site characteristic of Brodie's abscess, but the abscess may secondarily spread into the epiphysis and easily be confused with tuberculous osteitis. A negative Mantoux test points to Brodie's abscess. Confusion with chronic septic osteomyelitis can also occur, particularly where the process is extensive as in my last case. On the other hand, the clinical symp-

toms are usually more continuous in chronic septic osteomyelitis than in Brodie's abscess. Clinically the short attacks of severe pain in conjunction with hyperpyrexia lasting for one or two days, impaired motility of the adjacent joint as well as long intervals of complete freedom from pain and fever are typical of Brodie's abscess. Surgery results in a rapid and certain cure in a case of Brodie's abscess, whereas when we are dealing with tuberculous osteo-arthritis or chronic septic osteomyelitis, the post-operative course is apt to be more prolonged and complicated by recalcitrant sinus formation.

ZUSAMMENFASSUNG

In einer vorangehenden Arbeit (Acta Orthop. Scand. Vol. XVI, Fasc. 2-3, S. 180-193) habe ich die typischen Erscheinungen der Knochenabszesse gemäss der Originalbeschreibung Brodies und der späteren einschlägigen Literatur dargelegt und eine von Brailsford im Jahre 1938 veröffentlichte statistische Erhebung zitiert, aus der ersichtlich wird, dass die Tibia die häufigste Lokalisation bildet. Dies wird ferner durch das Material der Röntgenabteilung des St. Göran-Krankenhauses aus den Jahren 1930-1945 bestätigt; es handelt sich um insgesamt 16 Fälle, und in 14 derselben war die Tibia der Sitz des Abszesses.

In jener Arbeit hatte ich 5 Fälle eingehend beschrieben, welchen ich nun einen weiteren Fall von Brodie-Abszess anzureihen Gelegenheit nehme. Sämtliche Patienten waren im Laufe der letzten 3 Jahre in der Orthopädischen Abteilung stationär behandelt worden. Bei dem letzten Fall waren beide Tibiae von dem Leiden befallen. Diese Fälle veranschaulichen die geringe Virulenz der Erreger und machen ersichtlich, dass die Röntgenbilder sehr genau analysiert werden müssen, ganz besonders mit Rücksicht auf die Lage des Herds in bezug auf die Epiphysenlinie. Der Sitz auf der diaphysalen Seite der letzteren ist für den Brodie-Abszess charakteristisch, aber der Abszess kann sekundär auf die Epiphyse übergreifen und dann leicht mit einer tuberkulösen Ostitis verwechselt werden. Eine negative Tuberkulinreaktion spricht für Brodie-Abszess. Eine Verwechslung mit chronischer septischer Osteomyelitis ist ebenfalls möglich,

namentlich wenn es sich — wie bei meinem letzten Fall — um einen ausgedehnten Prozess handelt. Andererseits sind die klinischen Erscheinungen bei chronischer septischer Osteomyelitis in der Regel stetiger als beim Brodie-Abszess. Klinisch sind die kurzen Anfälle von heftigen Schmerzen im Verein mit Fieber, die nur wenige Tage dauern, die Bewegungsbehinderung des benachbarten Gelenkes sowie die langen Zwischenräume völliger Schmerz- und Fieberfreiheit kennzeichnend für den Brodie-Abszess. In einem Fall von Brodie-Abszess führt die Operation zur raschen und sicheren Heilung, während bei tuberkulöser Osteoarthritis oder chronischer septischer Osteomyelitis der Nachverlauf sich oft mehr in die Länge zieht und durch schwer zu beeinflussende Fistelbildung kompliziert ist.

RESUME

Dans un précédent article publié dans *Acta Orthop. Scand.* vol. XVI fasc. 2—3, p. 180—193, j'ai rendu compte des symptômes typiques des abcès osseux conformément à la propre description de Brodie et à la littérature publiée subséquemment sur le sujet. J'ai cité les statistiques compilées par Brailsford en 1938 sur la base de 62 cas, d'où il ressort que le tibia est la localisation la plus commune de cette maladie. Ce fait a d'ailleurs été confirmé par les statistiques élaborées par le Service Radiologique de l'Hôpital de St. Göran pour les années de 1930 à 1945 portant sur 16 cas, chez 14 desquels le processus était localisé dans le tibia.

J'ai antérieurement décrit en détail 5 cas d'abcès de Brodie, auxquels vient s'ajouter celui signalé ici. Il s'agit de malades hospitalisés dans le Service Orthopédique durant les trois dernières années. Dans le dernier de ces cas les deux tibias étaient atteints. Ces cas font apparaître la faible virulence de l'agent irritant et font ressortir qu'il est indispensable d'examiner très minutieusement le radiogramme, notamment en ce qui concerne la position du foyer de l'abcès par rapport à l'épiphyse. Le côté diaphysal du bord de l'épiphyse est le siège caractéristique de l'abcès de Brodie, mais il peut arriver que l'abcès s'étende également sur l'épiphyse. Il est alors facile de le confondre avec l'ostéite tuberculeuse. Une réaction négative de la tuberculine peut indiquer qu'il s'agit de l'abcès de Brodie. Ces abcès peuvent être confondus également avec l'ostéomyélite septique chronique, surtout lorsque, le processus est très étendu, comme dans mon dernier cas. Toutefois, les symptômes cliniques sont généralement plus continus dans l'ostéomyélite septique chronique que dans l'abcès de Brodie. Cliniquement, l'abcès de Brodie se caractérise par de courts accès de violentes douleurs accompagnées de fièvre, qui durent quelques jours seulement, une motilité diminuée de l'articulation adjacente, et de longs intervalles pendant lesquels il n'y a ni douleurs, ni fièvre. Dans un cas d'abcès de Brodie l'opération amena une guérison rapide et sûre. Par contre, lorsqu'on se trouve en présence d'une ostéo-arthrite tuberculeuse ou d'une ostéomyélite septique chronique, la période post-opératoire est souvent très prolongée et se complique par la formation de fistules récalcitrantes.