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慢性經過ヲトル非結核性膿瘍ニ於ケル蛋白溶解素

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On the Proteolytic Ferment in Non-tuberculous Chronic Abscess.

By

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膿ガ培養上無菌的ニテモ「ゲラチン」ヲ液化スル作用アル時ハ，寒性膿ニ非ズ，普通ノ釀膿菌感染ニヨルモノト診斷シテ可ナル事ヲ，比較的稀ナル橈骨ヲ來レル Brodie 氏骨膿瘍ノ例ニ就テ說明シ膿ノ檢査方法ヲ述ベタリ。〔自抄〕

Although it is usually an easy matter to differentiate between a cold abscess and an abscess due to an ordinary pyogenic organism, yet it occasionally happens that the clinical pictures in a protacted or long neglected case of suppuration of the latter type, simulate so closely a cold abscess as to make one hesitate in drawing a definite conclusion. This difficulty is further increased when repeated cultures result negatively, as they frequently do in an old lesion.

In such cases, a test for proteolytic ferment of the pus obtained either by puncture or operation may become a considerable aid in differential diagnosis, as the case to be presented below will demonstrate.

The Technic of the Test.

To the pus obtained with a strict precaution against contamination, a 5% solution of phenol is added enough to make a 0,5% carbolized specimen. A few drops of the carbolized pus are placed on the surface of 10% gelatin solidified in a Petri dish,

and kept under practically a constant temperature of 20°C. A positive result is indicated by an appearance of a semiopaque depression on the surface of the gelatin in direct contact with the drops of pus, as figure 2 illustrates.

In our hands, the pus from an ordinary pyogenic abscess shows a positive reaction within the first 24 or 48 hours, whereas that from a cold abscess remains negative for the first 72 hours. According to Serisawa, the proteolytic reaction of pus obtained from a syphilitic lesion is at most not stronger than that of a cold abscess.

In this connection recent study by Sakamoto may be mentioned. This author has found that in testing for proteolytic ferment of the pus, its hydrogen ion concentration needs not be considered.

Presentation of the Case.

The patient, Mrs. H. N., aet 29 years, admitted to the Clinic May 12, 1931. Her family and past history was negative. In March, 1930 the patient first noticed a slight pain in the distal part of the forearm in moving the right wrist joint. In December of the same year the identical region became diffusely swollen, and by the middle of April, 1931 the swelling somewhat increased in size and a slight tenderness developed. During the entire course, however, there has never been a chill, an elevation of temperature, a local reddening or pain.

The general physical examination was negative for an evidence of tuberculosis or syphilis. Locally, the right forearm and the hand were normal in posture and motility. On the dorsal aspect of the lower third of the forearm there was a diffuse swelling which gradually disappeared at the wrist. The skin over the swelling was slightly reddened and warm, and the swelling was rather solid. There was definite oedema over the swelling which could not be detached from the underlying bone. Close to the wrist joint the radius showed a slightly tender area that was somewhat elevated the surface of the bone. Neither the epitrochlear nor axillary lymphnode was palpable.

The blood count and the haemoglobin content were normal. The sedimentation of erythrocytes was normal. The blood Wassermann reaction was also negative.

The roentgenogram (see fig. 5) showed a sparrow-egg sized shadow with a reactive ebonization of the surrounding bony tissue.

During the period of a week prior to the operation the temperature ranged between 36° and 37°C., the pulse between 80 and 90, and the local redness and temperature elevation have disappeared, but the swelling, hardness, and oedema have not changed.

At the operation a thickening of the radius the size of the tip of a thumb is noted on its dorsal surface slightly medial to the midline. At the center of this thickening there was a small fistulous opening surrounded by a hyperplastic zone of periosteum.

The sinus was filled with granulation containing a trace of clearfluid, passed outwards and superiorly through the space between Mm. extensori policis longus et brevis, and occupied a space about 3 cm in diamenter immediately beneath the deep fascia. The fistula led down to a cavity with a diameter of about 1 cm located within the thickening of the radius. The cavity also contained the granulation which was continuous with that described above. Neither a sequestrum nor caseous material was found.

The cavity was throughly curetted, the granulation completely removed and the wound closed in layers. The postoperativ course was uneventful and the wound healed by primary intention.

Out of 4 agar-agar cultures obtained there was a growth of staphylococcus aureus only in one, the others remaining sterile.

Histologically the granulation tissue showed a picture of chronic inflammation. (see fig. 6)

The clear fluid obtained at the operation, together with the small fragments of granulation tissue, was droped upon the surface of gelatin in Petri dishes and the proteolytic reaction was observed. An evidence of liquefaction of gelatin appeared in 24 hours and at the end of 48 hours it has become markedly positive.

Comment.

The case presented is that of osteitis that had taken a very protracted course. That it was neither syphilitic nor tuberculous could be determined by the usual clinical studies, but it was only by the positive protease test that its pyogenic nature was established. Moreover, there was no basis for suspecting that the pyogenic process was engrafted upon pre-existing tuberculous focus in the bone.

In addition to these facts, the findings by roentgen rays and at operation have confirmed that the case was that of Brodie's abscess of the radius. Because of the distance between site of the lesion and the joint, there was no joint involvement such as hydrarthrosis, but on the contrary it had perforated the cortex of the bone toward its extensor surface and presented the symptoms and signs as were described in the case report.

That the typhoid bacillus, also may be the causative organism in Brodie's abscess is reported. Our patients had not had any typhoid infection, and our "re-enforced" Widal reaction has excluded this possibly. The test is made in the following manner. The patient and another individual who is known to have had tyhoid infection past are given an intravenous injection of 0.2 cc of typhoid Koktigen, Torikata. On the 4th or 7th Widal test is made of each subject. The individual who had passed through a tyhoid infection shows a rapid and marked rise in the strength of the

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Fig. 1.

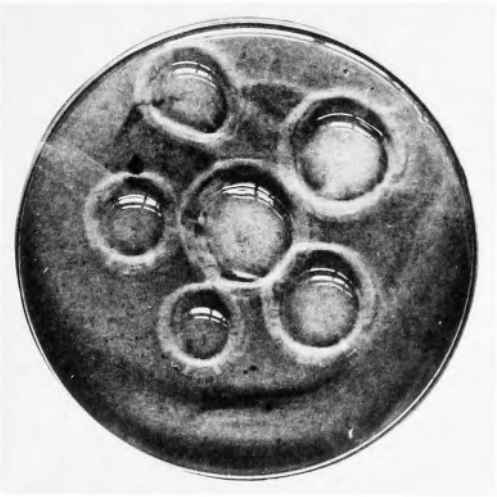

Fig. 2.

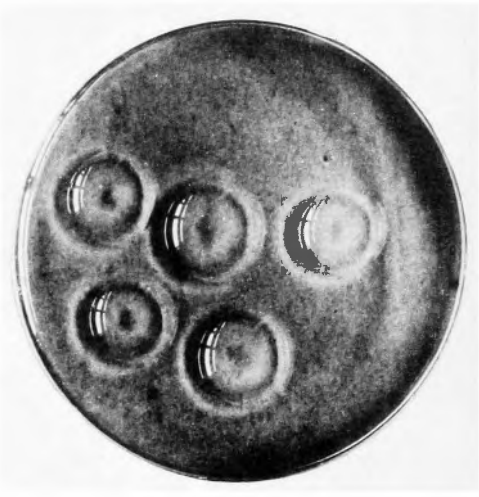

Fig. 3.

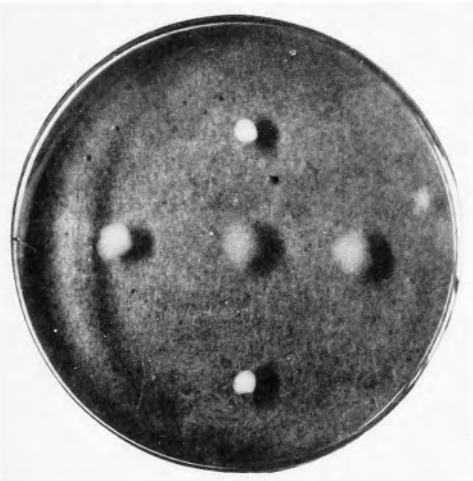

Fig. 4.

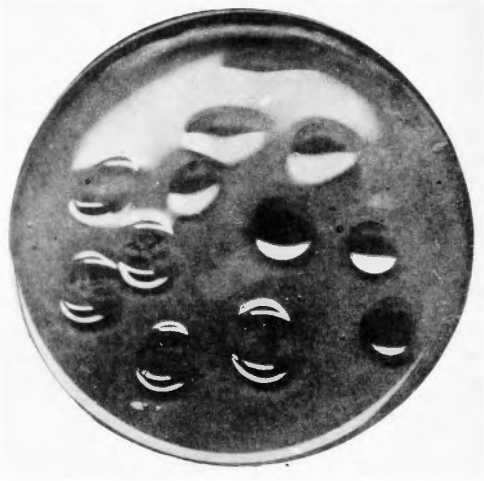

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Fig. 5.

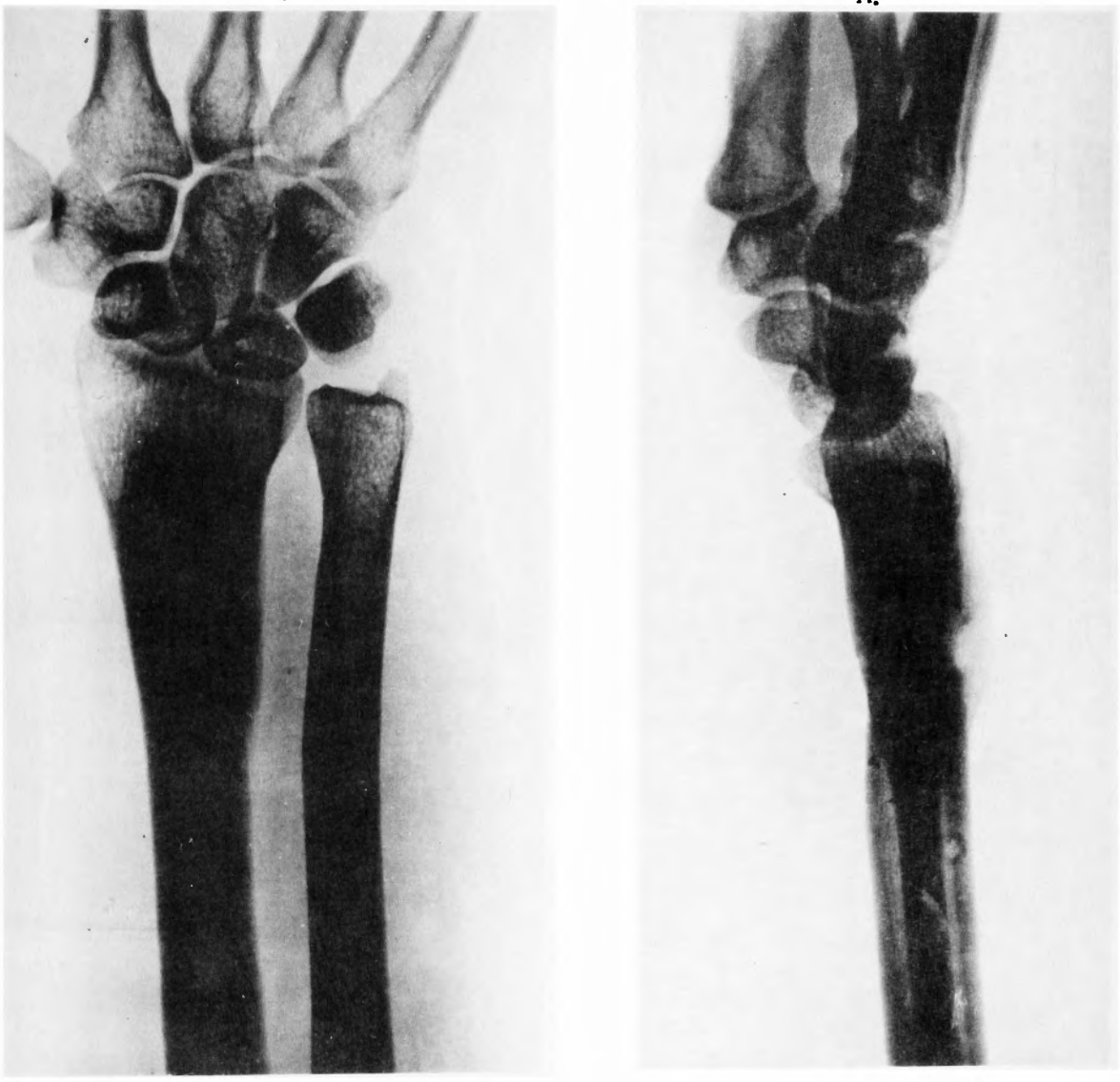
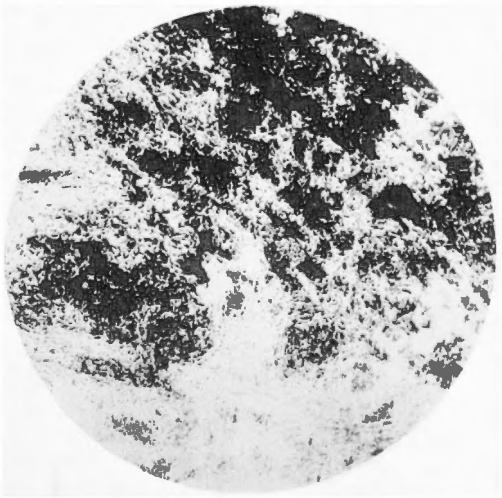


Fig. 6.



reaction. Such a finding was not obtained with our patient.

Summary.

1. Differention between cold abscess and an abscess by ordinary pyogenic organism is simple and clearly made by the test of proteolysis.

2. Even when the abscess is a chronic one and the culture from its contents is sterile, its true nature may be revealed by the test.

3. Even when the pus is culturally positive for pyogonic organism, the absence of the protease reaction excludes the organism present as causative agent.

4. In these respect, the presence of the proteolytic ferment in the pus is more important and significant than the results of cultural study.

Explanation of Figures.

Fig. 1. Positive reaction with 6 drops of 0.3% trypsin solution on gelatin plate.

Fig. 2. Positive reaction with 5 drops of pus from an acute pyogenic osteomyelitis.

Fig. 3. Negative reaction with 5 drops of pus from tuberculous osteitis.

Fig. 4. Strongly positive reaction with 11 drops of pus from the case reported in the present paper.

Fig. 5. Roentgenograms of the forearm of the present case.

A. Lateral view.

B. Antero-posterior view.

Fig. 6. Photomicrogram of the granulation tissue from the present case. (about 100×)