

PYOGENIC SPONDYLITIS

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During the period 1972–1974 10 patients suffering from pyogenic spondylitis have been treated at the Central Hospital of Middle Finland. Three of the patients had become acutely ill with septic fever and back pain. In the remaining cases the onset of the disease was insidious. Fever, weight loss and fatigue were the general symptoms. Percussion revealed local tenderness at the site of infection in all patients. Two patients showed neurological signs. The ESR was elevated in all cases and alkaline phosphatase was elevated in six patients. Blood culture was positive in those three patients who had become acutely ill. Narrowing of the intervertebral space was observed in all patients. Scanning with Tc⁹⁹ was performed in nine patients, seven of whom were at an early stage of the disease; a significant uptake was recorded in five of these cases. The average interval between the onset of symptoms and the diagnosis was 3 months, range 1 to 5 months. The treatment consisted of bed rest and antibiotics. All the patients recovered and became symptom-free.

Key words: spondylitis; osteomyelitis

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Tuberculosis, including infectious spondylitis, is today relatively rare in Finland thanks to the new antituberculous drugs and the effective preventive measures being taken. At the same time pyogenic bacteria have gained importance as an aetiological factor. A similar trend is revealed by recent reports (Waldvogel et al. 1970, Ahlbäck et al. 1973, Serre et al. 1973 and Kido et al. 1973). Pyogenic spondylitis has increased in frequency in those areas where the intravenous use of narcotics is common, and the pyogenic spondylitis of drug addicts has been described in some recent publications (Holzman & Bishko 1971, Lewis et al. 1972 and Kido et al. 1973). The fact that numerous cases of pyogenic spondylitis with no such background have been diagnosed in our district during the period 1972–1974 is surprising. The purpose of this report is to clarify the course and diagnostic problems of

pyogenic spondylitis, since it is often difficult to diagnose the disease at an early stage.

PATIENTS AND METHODS

During the period 1972–1974 10 patients with pyogenic spondylitis were admitted to the Orthopaedic Department of the Central Hospital of Middle Finland. The diagnosis was based on the clinical picture and the radiological findings. Further information was gained by culture of pus from an abscess in one case, by blood culture in three cases and by serological tests in five cases. The clinical course of the disease and the radiological findings were the only criteria in one case. Short case histories are given in Table 1. The average age of the patients was 47 years. Five patients were males and five females.

Location. The sites of infection are shown in Figure 1. The lumbosacral spine was involved in six cases, the thoracic spine in four.

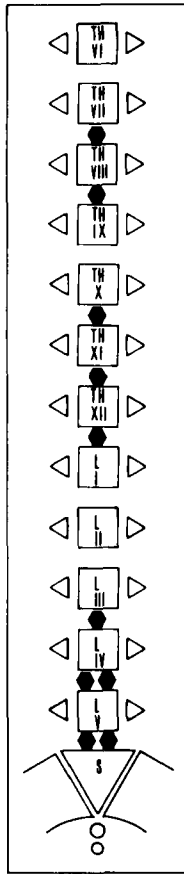


Figure 1. The sites of pyogenic spondylitis.

The course of the disease. Three patients became acutely ill with septic fever and back pain. In these cases blood culture was positive. In the remaining cases the onset of the disease was insidious.

Symptoms. The general symptoms were fever, weight loss and fatigue. An acute onset of the disease was associated with septic fever (40°C). In the insidious cases the patients were subfebrile. All patients had back pain, which usually was localized. This was the symptom for which the patients consulted a physician.

The primary focus. The possible primary focus of bacteraemia was revealed by the history in three cases. One patient had had tonsillitis 6 weeks before the onset of symptoms. Another patient had caught erysipelas of the hands 2 weeks before the onset of symptoms, and a third patient had had a tooth fixed 10 days before the symptoms began.

Predisposing factors. Factors predisposing to infection were present in four cases. One patient showed agranulocytosis due to thyrostatic therapy. Two patients had latent diabetes, and one was a chronic alcoholic.

Physical findings. Percussion revealed local tenderness at the site of infection in all patients. Neurological signs were found in two patients. One had transient signs originating in the cauda equina, the other showed a hyper-reactive Achilles reflex.

Laboratory findings. The ESR was clearly elevated in all patients; the values ranged from 66 to 141. Slight anaemia (<120 g/l) was observed in seven

Table 1. Short case histories

Patient	Sex	Age	Local symptoms	General symptoms	Predisposing factors	Interval between presenting symptoms and diagnosis (months)
S.L.	F	32	Back pain	Fever	Agranulocytosis	2
U.A.	M	54	Back pain	Fever	—	3
R.R.	M	36	Back pain	Fever Weight loss Fatigue	Chronic alcoholism	5
T.L.	M	62	Back pain	Weight loss	Latent diabetes	3
J.N.	M	17	Back pain	Fever	—	1
K.S.	M	54	Back pain	Weight loss	—	—
R.N.	F	38	Back pain	Fever Weight loss	—	4
A.O.	F	33	Back pain	Fever	—	1
S.K.	F	62	Back pain	Fever	Latent diabetes	1.5
I.H.	F	78	Back pain	Fever	—	3

and mild leucocytosis ($>10,000$) in four cases. The patient showing agranulocytosis had a haemoglobin value of 76 when it was at its lowest, but this was attributed to his haematological disease rather than to the infection. Alkaline phosphatase was elevated in six patients.

Bacteriology. Blood culture was positive in three patients. *Staphylococcus aureus* was identified in two cases; *Streptococcus faecalis* in one. A sample of pus from the site of infection was obtained at exploration in one case. *Staphylococcus aureus* was demonstrated on culture of this sample. The ASTA values were elevated (≥ 4) in eight cases (range 4 to 32).

Radiological findings. Narrowing of an intervertebral space was observed in all patients (Figure 2). A wedge-shaped deformity was noticed in three patients and an abscess shadow in two.

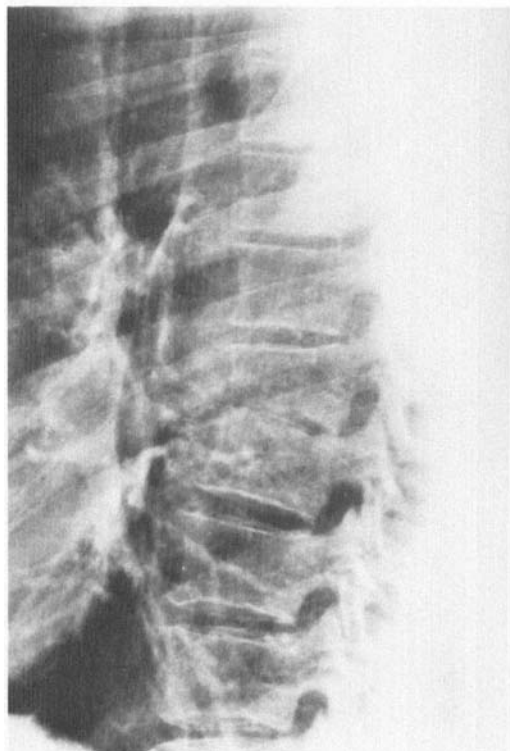


Figure 2b

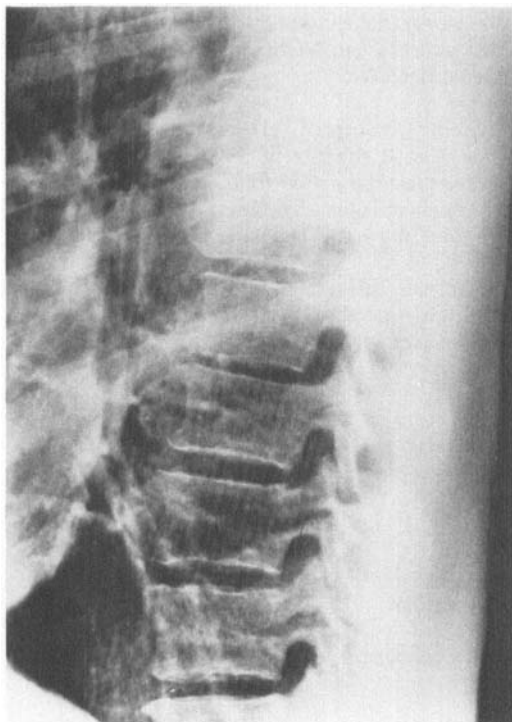


Figure 2. 36-year-old male (R.R.) who became acutely ill with septic fever and back pain. (a) Two weeks after the onset of symptoms slight narrowing of an intervertebral space. (b) Five weeks from the onset of symptoms vertebral collapse of the 7th vertebral body resulting in slight kyphosis. (c) Eleven months from the onset of symptoms the infection has been cured and vertebral fusion is seen.

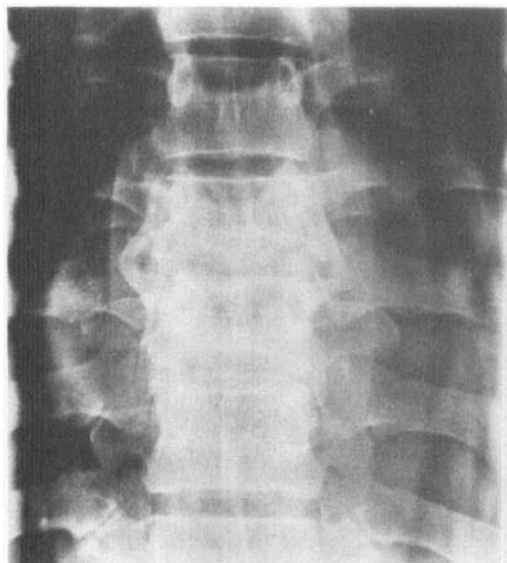


Figure 2c

Union of the vertebral bodies varying in degree was observed in eight patients during an observation period of 6 to 30 months.

Radioactive isotope scanning. Scanning with Tc^{99} was carried out in nine patients, seven of whom were at an early stage of the disease. A significant uptake was noticed in five of these cases.

The average interval between the onset of symptoms and the diagnosis was 3 months, range 1 to 5 months. All patients were hospitalized for 3 weeks before a definite diagnosis could be made.

Treatment. All patients were admitted to the Orthopaedic Department. In the early stages of the disease the treatment consisted of bed rest and antibiotics. The average duration of hospital treatment was 64 days, range 36 to 99 days. Antibiotics were given for 142 days on the average, range from 45 to 321 days. If blood culture was positive, the choice of antibiotic depended on the determination of resistance. Otherwise an antibiotic generally known to be effective against *Staphylococcus aureus* was given, e.g. Cloxacillin[®], Lindomysin[®] or Erythromycin[®]. The patients responded favourably to the treatment; all recovered and became symptom-free.

DISCUSSION

Previously, febrile patients with a high ESR may have been treated with antibiotics for a long time without any knowledge of the specific infection of the spine and may thus have become symptom-free under a wrong diagnosis. It is also possible, as Martin (1970) assumed, that many patients who in the past were treated for tuberculous spondylitis and recovered rapidly did, in fact, suffer from spondylitis caused by pyogenic bacteria.

A specific bacteriological diagnosis must be the goal. When the disease has an acute onset, blood culture is usually positive. If the onset is subacute, blood culture is usually negative. Biopsy performed with a trocar under TV monitoring is technically difficult, but this method has increased in popularity (Sneppen et al. 1976). The possible complications are nerve palsy and meningitis. Ambrose et al. (1966) and Lewis et al. (1972) successfully obtained bacterial samples by needle

aspiration. Holzman & Bishko (1971) disputed the necessity of specific bacteriological diagnosis and resistance determination and thus also of early exploration. This standpoint is justified with regard to the spondylitis of addicts. These cases are often caused by gram-negative bacteria resistant to antibiotics. In Finland, exploration is not absolutely necessary, since *Staphylococcus aureus* is the most frequent causative agent, and the diagnosis can often be supported by serobacteriological tests. Von Schwägerl (1969) proved the diagnostic validity of ASTA-determination in deep, progressing infections caused by *Staphylococcus aureus*, especially in spondylitis. A diagnosis based on the clinical course of the disease, the radiological findings and serobacteriological tests will often suffice for the institution of therapy. In fact, a positive reaction to the therapy is diagnostic. If a malignant or other tumour cannot otherwise be excluded, exploration is of course mandatory.

Radiological demonstrable lesions in pyogenic spondylitis may develop very quickly. A slower process is an important diagnostic criterion in tuberculous spondylitis. Isotope scanning is of less value diagnostically because the method is non-specific. Still, this technique may be used in both the diagnosis and the follow-up of pyogenic spondylitis. It is a good indicator with regard to the reactivation of an infectious process (Kemp et al. 1973) and roentgenographically dubious primary lesions and recurrences (Felländer & Lindberg 1966).

The treatment of pyogenic spondylitis is usually conservative; antibiotics and bed-rest may be recommended. A plaster bed, as was formerly used, is not required. Operation is indicated if conservative treatment fails and there is progression of neurological signs.

An early diagnosis of the disease is difficult. Fever, back pain, a high ESR, slight anaemia and mild leucocytosis are typical features, but a similar clinical picture is seen in many other diseases, e.g., malignant tumours. Because of the general symptoms, the back pain may easily be ignored and the patient may therefore be subjected to unnecessary examinations and

procedures. Waldvogel et al. (1970) stated that an early diagnosis depends on a clinical suspicion. If the diagnosis is made early enough, neurological complications are rare and the prognosis is good.

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