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HAEMOPHILUS INFLUENZAE PYARTHROSIS IN A YOUNG ADULT WITH SUBSEQUENT TEMPOROMANDIBULAR JOINT INVOLVEMENT

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Summary. A case of Haemophilus influenzae pyarthrosis in a young adult with subsequent temporomandibular joint involvement is described. The management of the patient and the late involvement of the temporomandibular joint is discussed.

Introduction

Haemophilus influenzae is a small, aerobic, pleomorphic, gram negative coccobacillus. The organism was first described by Pfeiffer in 1892, who erroneously designated this pathogen as the cause of epidemic influenzae because of its constant presence in the characteristic purulent sputum. The coccobacillus is divisible into capsulated and non-capsulated strains (Pittman, 1931). The great majority (95 per cent) of strains of Haemophilus influenzae found in the respiratory tract are non-capsulated and are generally pathogenic only in a secondary role. The remaining strains are capsulated, a minority of which may colonise the throats of a few healthy carriers and may act as primary pathogens in the respiratory tract and meninges. Capsulated strains can be further divided serologically into six types designated by the letters A–F. The division is due to differences in the chemical structure of the capsular polysaccharides.

Haemophilus influenzae type B organism causes meningitis (Kaplan & Brande, 1958), pneumonia (Crowell & Loube, 1924; Kaufman, 1960), endocarditis (Goetz & Peterson 1949; Rose 1941), pericarditis (Hensler, 1955), laryngitis (Brewer & Ramko, 1948) and pyarthrosis (Dyer *et al.*, 1955).

Pyarthrosis secondary to Haemophilus influenzae is uncommon in adults (Raff & Dannaher, 1974). However, the incidence has been increasing particularly in children between the ages of seven months and four years. According to Alexander (1962) the meninges and the joints are the areas most commonly involved in localised suppuration following invasion of the blood stream by the organism. A further case in a young adult is presented.

Case Report

A 19-year-old Caucasian girl attended her local hospital complaining of severe pain in both knee joints, ankles, the left elbow and the small joints of her left hand. The symptoms had been present for three days. The patient also reported a history of recurrent sore throats for the past six years, the most recent episode being five days earlier. The only other relevant fact in her medical history was a record of sensitivity to penicillin and elastoplast. There was no family history of rheumatoid arthritis.

On examination, the patient was pale, ill and having intermittent rigors. She was in

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considerable pain and unable to move her hands and legs. Her temperature was 98.4°F and her blood pressure normal. Chest signs were negative and there were no cardiac abnormalities. Both knee joints, ankles and the left hand were warm to touch. These joints were extremely painful and no movement could be attempted. A provisional diagnosis of rheumatoid arthritis was made, and treatment started with erythromycin 100 mg, intramuscularly t.d.s and aspirin 900 mg, q.d.s.

On admission, laboratory investigations revealed a haemoglobin of 11.9 grams per cent, E.S.R. (Westergren method) 104 mm/hour, white blood cell count 14,000 mm^3, with 73 per cent neutrophils, 26 per cent lymphocytes and one per cent monocytes. The red blood cells were reported as being normochromic and normocytic. The serum urea was raised to 120 mg/100 ml, and serum electrolytes were normal. The urine was a pale straw colour with a specific gravity of 1010, a pH of 5.5, protein + +, glucose, acetone and bile salts were normal. The Rose-Waaler and R.A. latex slide tests were negative. A serum antistreptolysin level of 150 units/ml was noted. Serum proteins and electrophoresis were normal. Throat swabs were taken and failed to show any growth after 24 hours.

Over the next two days, the patient became more pyrexial with a temperature of 102°F. The E.S.R. had increased to 130 mm/hour. Blood cultures were taken on both days, and these failed to show any growth after 24 hours. However, it was later reported that Haemophilus influenzae had been isolated from the second blood culture. On confirmation of the blood culture, both knee joints were aspirated and disclosed a thick blood stained fluid. Cultures of the aspirate also showed a heavy growth of Haemophilus influenzae which was reported to be sensitive to ampicillin, chloramphenicol, gentamicin, polymyxin, erythromycin, trimethoprim and cephaloridine at therapeutic levels. The diagnosis of pyarthrosis due to Haemophilus influenzae was confirmed. Antibiotic therapy was changed to cephaloridine 1g I.V. t.d.s. and the analgesic regime altered to phenylbutazone 200 mg. t.d.s. and indomethacin suppositories 100 mg. b.d.

Radiographs of the affected joints revealed no significant changes except in the right knee joint where early loss of the cortical line at the lateral femoral condyle was noted.

With the change of antibiotics the patient became apyrexial and her joint symptoms slowly resolved. However, she was left with residual stiffness in her right knee which was treated with manipulation under general anaesthesia followed by Russels traction and subsequent physiotherapy.

Eighteen months later the patient was referred to the Department of Oral Surgery for investigation and treatment since she was now complaining of trismus. The patient reported that her restriction with jaw movements seemed to have started when her other joint infections were resolving. The trismus was getting progressively worse. Clinical examination showed a maximum opening of 12 mm between the upper and lower incisal edges, and the patient's mandible deviated to the left on opening. Palpation of the temporomandibular joints showed little or no movement of the left condyle during all mandibular excursions. Radiographs of the joints (Fig. 1) showed a normal structure on the right side, but a reduced joint space and deformed condylar head on the left side. The patient denied any history of trauma to the joint or ear infections. A tentative diagnosis of ankylosis of the left temporomandibular joint subsequent to a Haemophilus influenzae polyarthritis was made.

To relieve the ankylosis, arthroplasty of the joint was considered essential. Under general anaesthesia, the left temporomandibular joint was exposed via an endaural incision. The joint capsule appeared thin and atrophic, and the joint itself was obliterated by an osseous callus. The callus was divided horizontally and a sialastic

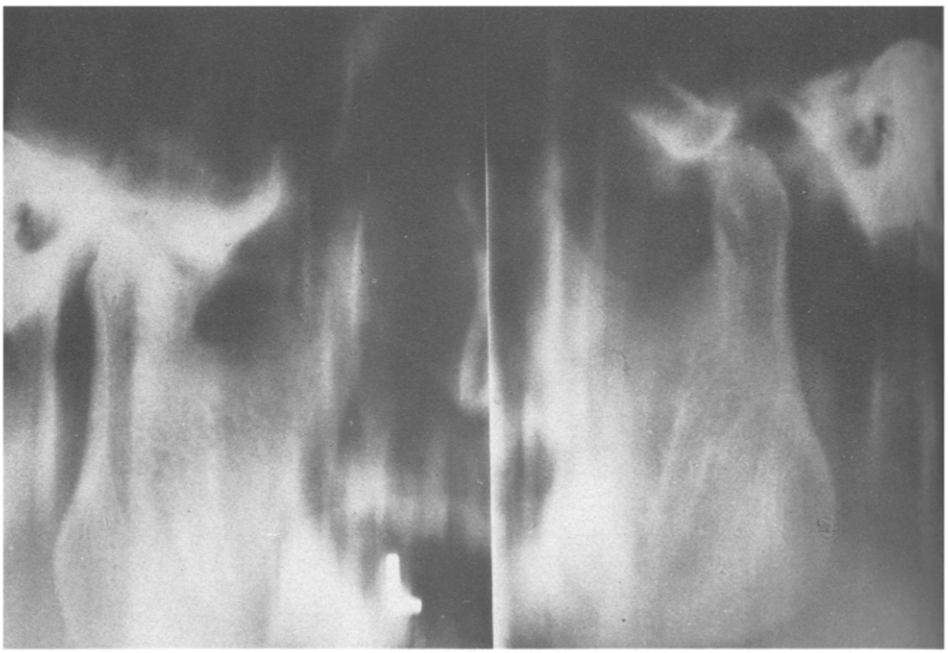

FIG. 1. Tomograms of right and left temporomandibular joint taken at maximum opening, showing deformed left condylar head.

implant inserted between the cut ends of the callus. Post-operative recovery was uneventful and with the aid of a jaw exerciser and local physiotherapy, jaw opening and movement returned to within normal limits.

Discussion

There are several interesting features arising from this case. The first problem was one of correct diagnosis. The initial presenting clinical signs and symptoms strongly suggested a diagnosis of rheumatoid arthritis, but this was not confirmed serologically. The gradual increase in temperature and E.S.R. would suggest an infection, yet repeated blood cultures on two consecutive days failed to show any growth after 24 hours. However, seven days later, it was reported that the second blood culture produced a strong growth of Haemophilus influenzae. In retrospect perhaps the joints should have been aspirated earlier and cultured.

Once the diagnosis had been confirmed, the antibiotic regime was changed from erythromycin to cephaloridine. Turk and May (1964) reported on the antibacterial drug sensitivities of Haemophilus influenzae. The minimum inhibitory concentrations for erythromycin and cephaloridine were 1μg/ml and 5μg/ml respectively. However, the antibiotic action of erythromycin is bacteriostatic, whereas the antibiotic action of cephaloridine is bacteriocidal. Cephaloridine has also been shown to have good penetration into bone and synovial capsules (Hughes *et al.*, 1975).

The second interesting feature about this case is the age of the patient. Most of the previous reported cases of pyarthrosis due to Haemophilus influenzae have been in young children. The few adult cases have all occurred in patients over 40 years. The patient described in this report was only 19 years old when she presented with symptoms. Of the adult cases previously described, many presented with symptoms

involving one or two large joints. In this case, several joints were reported as painful and appeared swollen.

The seemingly late involvement of the left temporomandibular joint requires further explanation. The patient started to complain of restricted jaw movements some six months after the initial pyarthrosis. Admittedly she could have developed trismus earlier, but because of her poor general condition paid no attention to it. It appears that as a result of the Haemophilus influenzae pyarthrosis, two joints were left with residual damage, the right knee joint and the left temporomandibular joint.

The following sequence of events may have occurred and perhaps serve as an explanation for the delayed changes in the left temporomandibular joint. Firstly, haemotogenous spread of Haemophilus influenzae into the synovial membranes of the left temporomandibular joint, followed by infection of the synovial fluid, perhaps via the synovial villi. Secondly, there may have been direct spread of infection involving the joint capsule, disc and eventually the condylar cartilage. In a young adult, the cartilage will still be active and not bounded by an intact plate of sub-articular bone. Finally, it would be difficult to determine what factors would decide whether the repair of such a damaged joint could take place by bony or fibrous ankylosis. Certainly, the limitation of movement as a result of damage to the joint would favour bony repair and this would account for the osseous callus. Antibiotic therapy would influence the sequence of events described above and would perhaps contribute to the delay in clinical symptoms.

It is interesting to speculate on the original source of the Haemophilus infection. The patient reported a past history of recurrent sore throats. However, throat swabs taken on admission failed to show any growth after 24 hours. There was no previous history of throat swabs having been taken before this.

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