

RUBELLA SYNOVITIS

BY

R. J. CHAMBERS AND E. G. L. BYWATERS

M.R.C. Rheumatism Research Unit, Canadian Red Cross Memorial Hospital, Taplow, Bucks

Arthritis was first described as a complication of rubella by Geiger (1918), but received scant attention, although Bennett and Copeman (1940) reported four cases among 300 patients with rubella and Loudon (1953) and Lewis (1953) noted its preferential occurrence in adult females in the 1953 epidemic. More recently, Lee, Barnett, Scholer, Bryner, and Clark (1960) reviewed twenty cases seen in California and summarized the general pattern of arthritis. The widespread epidemic of rubella in Great Britain in the summer of 1962 resulted in a

number of reports of synovitis and tenosynovitis as a complication (Branch and Taylor, 1962; Davison, 1962; Johnston, 1962; Moylan-Jones and Penny, 1962; Lee, 1962), including the carpal tunnel syndrome (Heathfield, 1962).

The clinical findings in five patients with rubella synovitis whose symptoms were severe enough to warrant admission to a Rheumatism Unit are described here, together with changes in the synovial fluid which have not been recorded previously (Table).

TABLE
CLINICAL PARTICULARS IN FIVE FEMALE CASES

| Case No. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---------------------------------|---|----------------------------|
| Age (yrs) | 14 | 30 | 51 | 28 | 55 |
| Onset in Relation to Rash | 6 days before | 4 days after | 1 day after | 2 days before | Same day |
| Duration of Synovitis (days) | 15 | 5 | 21 | 25 | 5 |
| Joints Involved | Wrists, MCP, PIP, hips, knees, ankles, MTP | Wrists, MCP, elbows, knees, ankles, MTP | Wrists, MCP, PIP, knees, ankles | Wrists, MCP, PIP, shoulders, elbows, hips, knees, ankles, mid-tarsal, MTP | Wrists, MCP, elbows, knees |
| E.S.R. Initial (mm./hr) | 40 | 20 | 11 | 18 | 12 |
| Blood Leucocytes (per c.mm.) | 6,300 | 3,800 | 3,600 | 8,200 | 5,300 |
| Percentage Plasma Cells | 5 | 12 | 2 | 2 | 24 |
| Synovial Fluid in Knees (ml.) | 10 | 4 | 9 | 3 | 20 |
| Synovial Fluid Leucocytes (per c.mm.) | 14,600 | ND | ND | ND | 15,000 |
| Differential Count: | Mainly macrophage and synovial. Rare polymorphs | Mainly macrophage and synovial. Rare polymorphs | 51 26 23 | 50 33 17 | 23 65 12 |
| Synovial Fluid Protein (g. per cent.) | 3.0 | 1.9 | 2.7 | ND | 3.4 |
| Differential Agglutination Test | neg. | ND | neg. | neg. | neg. |
| Latex Fixation Test | neg. | ND | neg. | neg. | neg. |
| L.E. Test (or ANF) | neg. | neg. | neg. | neg. | neg. |
| Paul-Bunnell Test | neg. | ND | ND | neg. | neg. |
| C-Reactive Protein | neg. | neg. | neg. | neg. | neg. |

ND = not done.

Material and Methods

All five patients were females between 14 and 55 years of age who had no previous history of rubella or arthritis. The diagnosis of rubella was based on the presence of fever, the typical rash, and lymphadenopathy, as well as a history of contact. All had a significant proportion of plasma cells in the blood, with leucopenia in two cases (Table).

On admission, after the clinical examination, blood was withdrawn for erythrocyte sedimentation rate, haemoglobin, white blood count, differential count, estimation of serum proteins and electrophoresis, Paul-Bunell agglutination titre, antistreptolysin-O titre, C-reactive protein, Rose-Waaler test (method as described by Bywaters and Scott, 1960), latex tests, L.E. cell test, and detection of antinuclear factor. Nose and throat swabs were taken. The urine was cultured and examined microscopically. A chest x ray was taken.

Joint aspiration was performed in all five cases while the inflammation was still in the acute stage, and the fluid was examined for protein content and cells.

Results

The pattern of joint involvement was similar in all five patients. The time of onset varied from 6 days before to 4 days after the appearance of the rash. The initial complaint was usually stiffness and aching pain in one or more joints, subsequently spreading over the next few days to other joints, involving them symmetrically and with increasing severity. The period of evolution of joint involvement varied from 3 to 13 days, and the total duration from 5 to 25 days, although two patients were troubled by residual joint stiffness for approximately 2 months. The metacarpophalangeal joints, wrists, and knees were involved in all cases, the ankles and proximal interphalangeal joints of the hand in four, elbows and metatarsophalangeal joints in three, hips in two, and shoulders and mid-tarsal joints in one only (Table).

The general pattern of illness is exemplified by the history of Case 4.

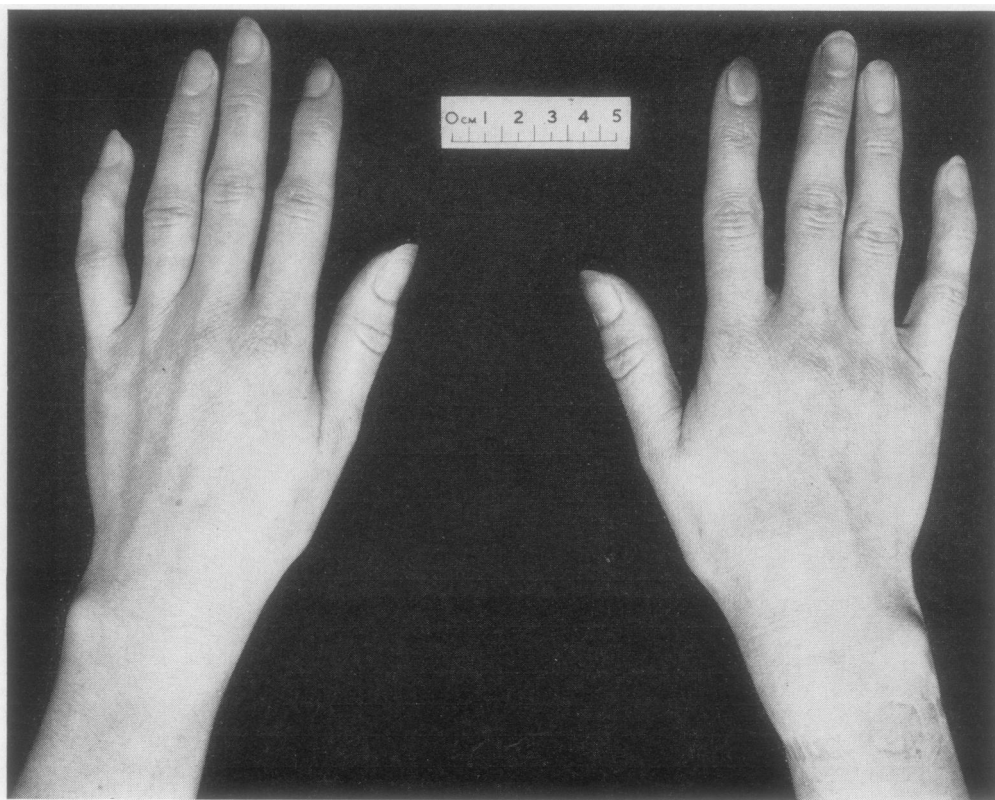


Fig. 1.—Joint and tendon involvement in the left hand in Case 4.

Case 4, a 28-year-old married woman, felt unwell 9 days before admission and 2 days later complained of headache, faintness, anorexia, painful glands in the neck, and pain in the hips, thighs, and knees. Her temperature was 99° F.

The next day the pain had spread to the ankles, elbows, and wrists; the neck was more painful, and the temperature had risen to 101° F.

A macular rash developed the following evening over the face, neck, upper chest, and back, which was slightly itchy. At this time she went to bed, and was given aspirin (75 gr. daily) with little symptomatic relief. The rash faded after 48 hours and she then noticed swelling of the knees, ankles, and hands, for which she was admitted to hospital.

Examination.—She was a thin, pale woman, in severe pain on any attempted movement. The tongue was dry, and the tonsils injected. The cervical, axillary, epitrochlear, and inguinal glands were all moderately enlarged, discrete, and tender. Movements of the neck were limited by painful glands, and there was pain in the shoulders, elbows, wrists, and 3rd and 4th metacarpophalangeal joints on both sides, with pain and soft tissue

swelling of the 2nd, 3rd, and 4th proximal interphalangeal joints (Fig. 1, opposite). Movements of the hips were grossly limited by pain. The knees were warm and painful with soft tissue swelling and small effusions. The ankles and 3rd, 4th, and 5th metatarsophalangeal joints were also swollen and tender.

There was no rash, the chest, cardiovascular and central nervous systems were normal, and no abdominal organs were palpable.

The symptoms and response to treatment are summarized diagrammatically in Fig. 2.

Laboratory Investigations.—The erythrocyte sedimentation rate was 18 mm./hr (Westergren); haemoglobin 77 per cent.; white blood count 8,200/c.mm. with plasma cells 2 per cent.; protein 6.9 g. per cent. with normal distribution; C-reactive protein negative; antistreptolysin-O titre 1:200, Paul-Bunnell test negative; Waaler-Rose and latex-fixation tests negative; no L.E. cells.

Nose and throat swabs sterile.

Mid-stream specimen of urine sterile and free from protein.

Mantoux test 1 : 100 weak positive.

Chest x ray normal.

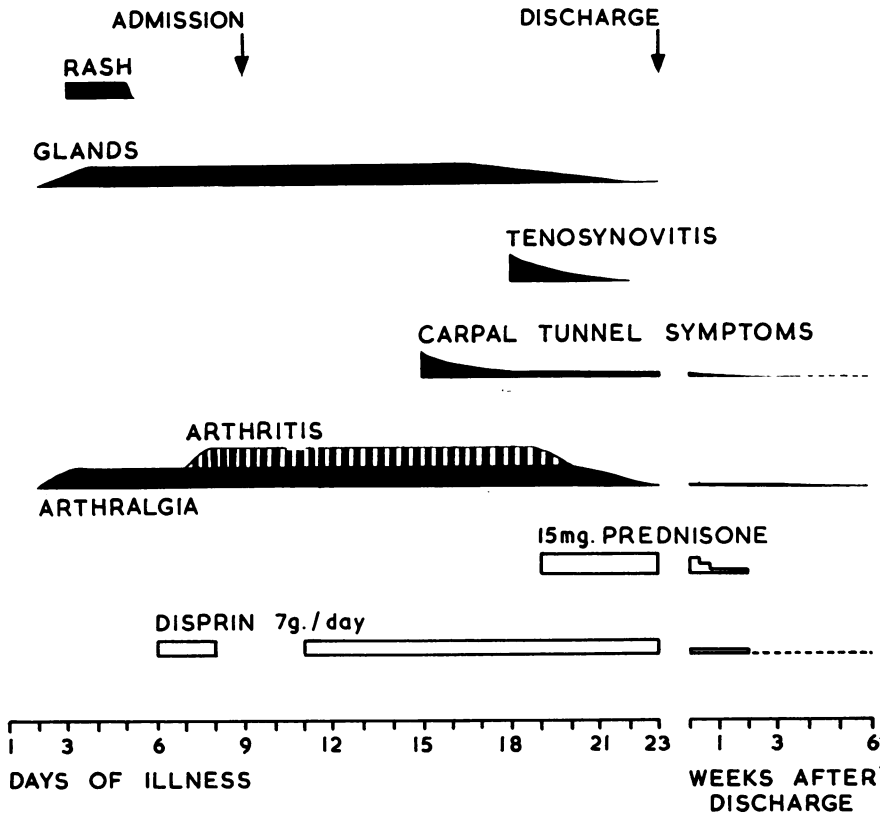


Fig. 2.—Chart of course in Case 4.

The left knee was aspirated to dryness on admission, yielding 3 ml. of very viscid pale yellow gelatinous translucent fluid.

Progress.—After admission, the knees and ankles became more swollen and painful, and no relief followed the administration of codeine phosphate and aspirin to 100 gr./day. After 6 days there was severe pain in the left shoulder, wrist, and hand, with swelling of the first three fingers and a feeling of cold, numbness, and diminished touch and pain sensation. Dorsiflexion of the wrist, and a cuff on the forearm at 70 mm. Hg increased the tingling sensation, indicating compression of the median nerve in the carpal tunnel. The following day she experienced similar pain, swelling, and numbness in the right hand. These symptoms persisted for 6 days, when the extensor tendons of the left 3rd and 4th fingers over the dorsum of the hand became tender and swollen with small effusions (Fig. 1).

Prednisone 15 mg. daily resulted in rapid remission of severe joint symptoms and tenosynovitis, and more gradual disappearance of the joint swelling. The total duration of steroid administration was 18 days, by which

time there were no residual joint signs, but the patient was still troubled by occasional stiffness in the left elbow and wrist, and 3rd and 4th fingers, with subjective tingling sensation in these fingers (Fig. 2).

Synovial Fluid Findings

On admission to hospital, all five patients were found to have painful knees, with soft tissue swelling and small effusions. The knee aspirations yielded small volumes of synovial fluid, never exceeding 20 ml. In each case the fluid was pale yellow and highly viscous. The protein content was lower than that usually seen in rheumatoid arthritis, ranging between 1.9 and 3.4 g. per cent. The striking cytological feature was the almost total absence of polymorphs, with predominance of mononuclear cells (macrophages, lymphocytes, and synovial cells). A typical example is seen in Case 4, and this is compared with the usual findings in rheumatoid arthritis in Fig. 3 (a) and (b).

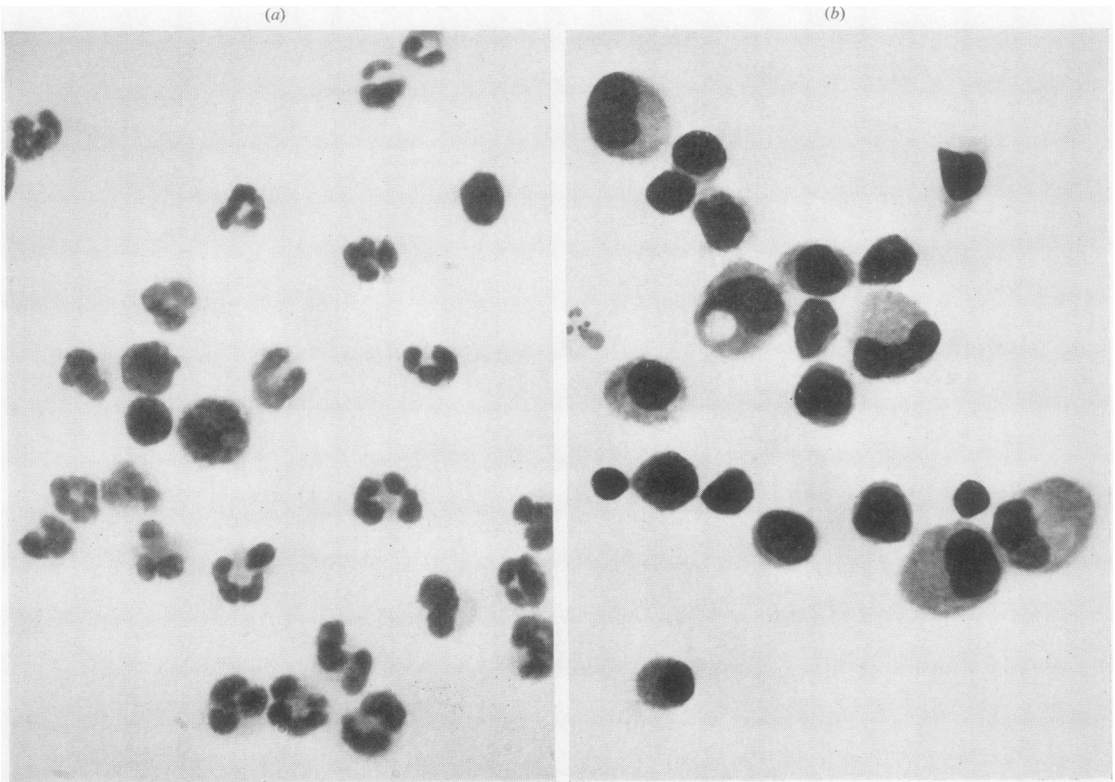


Fig. 3.—Comparison of the cells in the synovial fluid in rheumatoid arthritis (a) and in rubella synovitis (b).

Discussion

Rubella arthritis mainly affects adult females between the ages of 15 and 55, appearing a few days before, with, or after the rash, and lasting approximately 3 weeks. Although benign and of short duration, it may be severe enough to warrant admission to hospital, where it may be confused with rheumatic fever and rheumatoid arthritis. These general features have been documented by others, usually in epidemic years because, as Ingalls (1962) points out, the proportion of adult females affected increases greatly at such times. Thus Johnson and Hall (1958) describe ten females aged between 18 and 44 in whom the small and medium joints of the hands were most frequently affected. Latex inhibition tests were positive in nine of these ten cases (the test was also positive in two of seven non-arthritis control patients). Lee and others (1960) reviewed twenty cases of rubella arthritis and found that it tended to occur in adult females and to affect the small joints of the hands, wrists, knees, and ankles. In a later and larger series, Lee (1962) noted persistent fibromyositis or arthralgia in 25 per cent., but only one positive latex-fixation test.

The D.A.T. and latex tests performed on the serum of four of the present series in the acute stage of the illness were negative, and the serum protein pattern was normal. However, another adult female with rubella synovitis whose knee was not aspirated and who is therefore not tabulated here, had a positive latex test and a negative D.A.T.

Lee also noted the erythrocyte sedimentation rate to be raised to 40 mm./hr (Wintrobe) in three patients. Hynes (1940) carried out 86 observations of the erythrocyte sedimentation rate (Wintrobe, corrected for cell volume) in the first 12 days of the illness in sixty adult patients with rubella, and found a slight or moderate increase in ten instances during the first week; however, no absolute values were stated, and it is not known whether any of Hynes's patients suffered from arthritis.

Only one of the present series had a significantly raised erythrocyte sedimentation rate to 40 mm./hr (Westergren) in the acute stage of arthritis.

The synovial fluid findings, consisting of a highly viscous fluid with a slight increase in protein, containing almost no polymorphs but with an increase in macrophages and synovial cells, have not previously been documented, although Ropes and Bauer (1953) reported on the synovial fluid in one case of rubella arthritis in which there were 3,400 white cells, and no polymorphs (they did not state the nature of the white cells). In view of the existence of an exanthematous rubella, experimentally produced (Krugman, Ward, Jacobs, and

Lazar, 1953) and clinically observed (Ferguson, 1960), these synovial fluid changes may be of value in the study of benign transient polyarthritis (Lawrence and Bennett, 1960).

Summary

(1) The features of five patients with rubella synovitis severe enough to warrant hospital admission are described. Adult females are affected and show acute polyarthritis and tenosynovitis affecting particularly the wrist and knee joints and the small joints of the hands.

(2) The clinical course in one patient with arthritis associated with a carpal tunnel syndrome and tenosynovitis is described.

(3) The synovial fluid in all five cases showed an almost complete absence of polymorphs and a high incidence of mononuclear cells, mainly macrophages, synovial cells, and lymphocytes.

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Synovite compliquant la rubéole

RÉSUMÉ

(1) On décrit les caractères cliniques de cinq malades atteints de synovite survenant au cours de la rubéole; cette complication était suffisamment sérieuse pour nécessiter l'hospitalisation. L'atteinte porte sur des femmes adultes qui accusent une polyarthrite aiguë et une ténosynovite, localisées surtout dans le poignet, le genou et dans les petites articulations des mains.

(2) On décrit l'évolution clinique d'une malade atteinte d'arthrite associée au syndrome de la gouttière carpienne (*carpal tunnel syndrome*) et à la ténosynovite.

(3) Dans les cinq cas le liquide synovial révéla une absence presque complète de polymorphes et un grand nombre de cellules mononucléaires, surtout des macrophages, des cellules synoviales et des lymphocytes.

Sinovitis complicando la rubéola

SUMARIO

(1) Los caracteres clínicos de cinco enfermos con sinovitis rubeólica, suficientemente grave para justificar

hospitalización, se describen. Mujeres se ven afectadas y presentan poliartritis aguda y tenosinovitis afectando preferentemente las articulaciones de la muñeca y de la rodilla, así como las pequeñas articulaciones de las manos.

(2) Se describe la evolución clínica de una enferma con artritis asociada al síndrome de la gotera carpal (*carpal tunnel syndrome*) y a la tenosinovitis.

(3) El líquido sinovial mostró en los cinco casos casi una completa ausencia de polimorfos y un gran porcentaje de células mononucleares, principalmente macrófagos, células sinoviales y linfocitos.