

## Sternoclavicular erosions in polymyalgia rheumatica

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**SUMMARY** The incidence of erosive arthropathy of the sternoclavicular joints in 25 consecutive cases of polymyalgia rheumatica was studied by means of sternoclavicular tomography. Definite erosions were found in 11 patients. Erosions were most likely to be found in patients whose symptoms had been present for more than 6 months.

Polymyalgia rheumatica (PMR) was first described by Bruce in 1888<sup>1</sup> under the name of 'senile rheumatic gout.' Since then the occurrence of an inflammatory arthritis in the syndrome has been well recognised, though the reported incidence of synovitis has varied widely in different series, ranging from 13 of 88 patients<sup>2</sup> to 55 of 80 patients.<sup>3</sup> Biopsy of the shoulder,<sup>4</sup> acromioclavicular (AC),<sup>5</sup> sternoclavicular (SC),<sup>3</sup> and knee joints<sup>2</sup> has shown chronic inflammatory synovial changes. Joint imaging by technetium-99m pertechnetate joint scintigraphy revealed increased uptake in 24 of 25 patients with PMR, the shoulders being the joints most often affected.<sup>6</sup> Coomes and Sharp<sup>7</sup> suggested that a 'central' arthritis, involving chiefly the joints of the spine and limb girdles, was the main pathological process in PMR. Miller and Stevens<sup>8</sup> found clinical evidence of arthropathy in the SC joints of 6 and the AC joints of 4 of 39 patients with PMR. Despite this evidence, and despite the failure to discover any consistent significant abnormality in muscle histology, biochemistry, or electromyography, some authorities still consider PMR a disease of muscles, not joints.<sup>9</sup>

The occurrence of an erosive arthropathy in PMR is even more controversial. Only 2 authors have reported a significant incidence of radiographic erosions. Andrews<sup>5</sup> found sclerosis and/or erosions of the sacroiliac joints in 11 of 27 patients with PMR. Bruk<sup>3</sup> found radiological erosions in 17 of 80 patients with PMR. The joints most commonly involved were the pubic symphysis and the sacroiliac joints. Sternoclavicular erosions were found in 5 cases, but attention was drawn to the difficulty of interpreting plain radiographs of these joints. Despite these 2 studies the occurrence of an erosive arthropathy in PMR has not been generally accepted.<sup>10 11</sup>

Our interest was aroused by the following case:

*Case 1.* A female medical practitioner aged 54 developed an influenza-like illness in March 1977. Muscle aching persisted, and in May she developed a soft swelling over the medial end of the right clavicle. In July tomograms of the swelling were performed at her local hospital and were reported as showing 'osteolytic lesions of the medial end of the right clavicle' (Fig. 1). By now she had lost 2 stones (12.7 kg) in weight and was generally unwell. Malignancy was suspected, and the finding of an erythrocyte sedimentation rate (ESR) of 100 mm/hour lent support to the suspicion. A long series of investigations was undertaken, including several biopsies of the clavicle and extensive radiological studies. No significant abnormalities were found. Deep x-ray therapy to the swelling was given. This was followed by a large local abscess, and this in turn by a brachial plexus lesion. At this stage she sought a rheumatological opinion. Polymyalgia rheumatica was diagnosed and the original tomograms were reinterpreted as showing erosions of the right SC joint. Bone scan showed increased uptake in both shoulders and SC joints. She responded dramatically to oral prednisolone. At follow-up in October 1980 she was well on a small dose of prednisolone, but repeat bone scan still showed increased uptake in SC joints, shoulders, and knees.

This case prompted us to try to determine the incidence of SC joint erosions in PMR by means of tomography.

### Patients and methods

Criteria for inclusion were as follows: (1) pain and stiffness in shoulder and pelvic girdles; (2) morning stiffness lasting more than 30 minutes; (3) erythrocyte sedimentation rate exceeding 35 mm/hour (Westergren); (4) absence of other rheumatic

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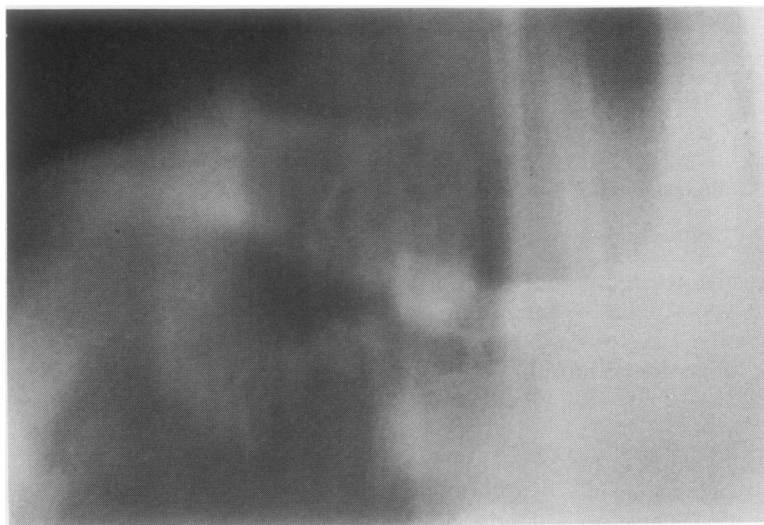


Fig. 1 Tomogram of right SC joint (case 1).

disorders to explain symptoms; (5) brisk response to prednisolone therapy; (6) negative Rose-Waaler test; (7) age between 50 and 70 years (the upper age limit was set to exclude the very elderly in whom degenerative changes in the SC joints would make interpretation difficult).

Subsequently a multicentre study of criteria for diagnosing PMR has been published.<sup>12</sup> In retrospect all our patients had 3 or more of the 7 criteria suggested in this paper.

Controls were chosen from normal volunteers in the same age range.

Each patient was carefully examined for joint tenderness or swelling, and intercurrent illness. Temporal artery biopsy was performed in all but one case. <sup>99m</sup>Tc diphosphonate bone scans were performed within 2 weeks of starting steroid therapy in 22 cases, with particular attention to anterior views of the SC areas on the gamma camera. Sternoclavicular tomography was performed by 2 methods: (a) linear longitudinal, with the patient lying prone or supine; (b) the patient being rotated with cross-wise blurring on the radiotome.<sup>13</sup>

### Results

Twenty-five consecutive cases of PMR presenting with active disease and fulfilling the above criteria were included. Nineteen were female and 6 male. The mean age was 59.5 years at the time of inclusion in the study. Twenty patients were untreated, with a history of symptoms for 2–36 months. Five patients had been treated before but had relapsed on withdrawal of steroids. The length of history in this group was 3–6 years. The controls comprised 11 women and 5 men, mean age 58 years.

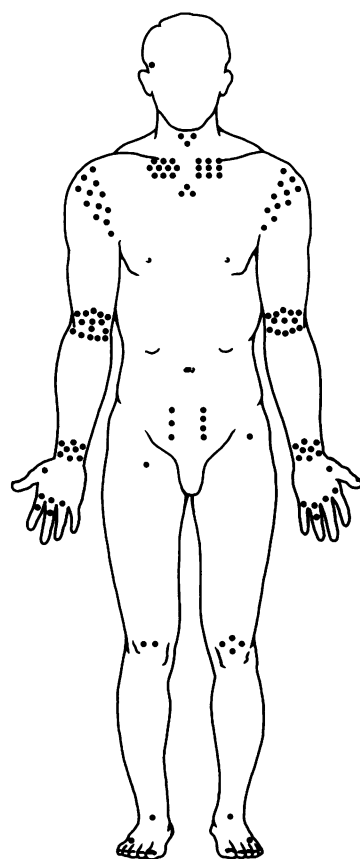


Fig. 2. Composite of 20 bone scans. Each dot represents increased uptake in that joint in one patient.

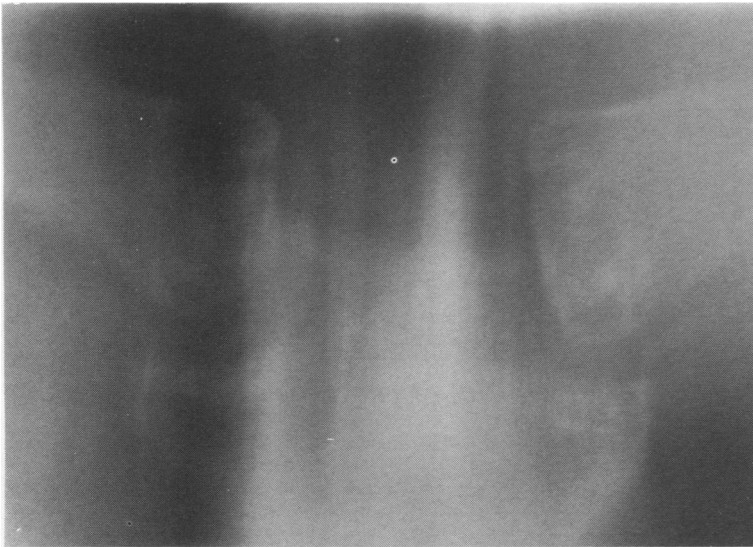


Fig. 3 Tomogram of SC joints showing erosions of medial ends of both clavicles.

**CLINICAL FINDINGS**

Seven patients had soft tissue swelling of one or both SC joints. Both knee joints were swollen in 4 cases, the manubriosternal joint in 2 and both wrist joints in one.

Temporal artery biopsy revealed giant cell arteritis in 3 cases.

<sup>99m</sup>Tc diphosphonate bone scan revealed increased uptake in one or more joints in 20 of 22 cases examined (Fig. 2).

Increased uptake in the SC joints was found in 12 patients. Uptake was also increased in the shoulders and elbows.

**SC TOMOGRAPHY**

The radiographs were interpreted by one of the authors (F.W.W.) admixed with the normal controls and without clinical data. Definite erosions (Figs 3 and 4) were seen in 11 patients. These were usually bilateral and affected both the clavicular and the manubrial articular surfaces. Doubtful erosions were reported in 4 patients. Of the controls one was reported as showing doubtful erosions (Table 1). The finding of erosions was not related to the age or sex of the patients. Of the 12 patients with increased SC uptake on bone scan 8 had definite erosions, while only 3 of 10 with normal scans had erosions (Table 2). There was a strong correlation with length of

history. Of the 9 patients with a history of less than 6 months only 1 had definite erosions, while erosions were found in 6 of 7 patients with a history of over 12 months (Table 3). Six of 11 patients with tenderness or swelling of the SC joints had erosions, compared with 5 of 14 with clinically normal joints (Table 4).

Table 2 SC erosions related to bone scan results

Bone scan uptake in SC joints	Erosions	
	Definite	Doubtful/absent
Increased	8	4
Normal	3	7

Table 1 SC erosions in PMR and in controls

Cases	No.	Definite erosions	Doubtful erosions	No erosions
Patients	25	11	4	10
Controls	16	0	1	15

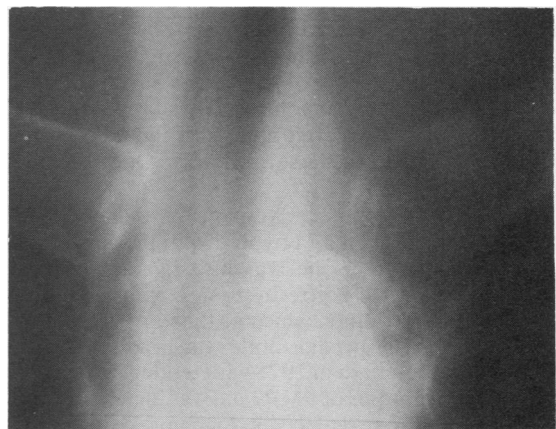


Fig. 4 Tomogram showing erosions of both surfaces of the left SC joint.

Table 3 SC erosions related to length of history before presentation

Length of history	Erosions	
	Definite	Doubtful/absent
Less than 6 months	1	8
6-12 months	4	5
13-24 months	1	0
Over 24 months	5	1

Table 4 SC erosions related to clinical evidence of synovitis in the SC joints

SC joints	Erosions	
	Definite	Doubtful/absent
Normal	5	9
Tender	2	2
Swollen	4	3

One of the 3 patients with giant cell arteritis had marked SC erosions.

#### FOLLOW-UP

The patients have been followed up over a period of 2 to 3 years. In no patient has the diagnosis been altered to rheumatoid arthritis or other inflammatory polyarthritis, and repeated Rose-Waaler tests have been negative in all but one case. This was a patient with biopsy-proved giant cell arteritis. Steroids have been withdrawn in 6 cases and reduced in most of the remainder. Seventeen patients had repeat tomography of the SC joints performed after an interval of 1-2 years. Three patients with previously normal SC tomograms had erosions on the follow-up films. Two of these had clinical synovitis of the SC joints on entry to the study. One patient with erosions showed progression. Five patients with erosions showed sclerosis and decrease in size of the erosions, suggesting healing. Eight patients showed no change. Seven patients with originally positive bone scans had repeat scans. Six still showed increased uptake in shoulder girdle joints though to a lesser degree. One became negative.

*Case 2.* A 54-year-old woman was diagnosed as having PMR in 1974 and treated with prednisolone. A few months later she was investigated for suspected retrosternal goitre by tomography. One cut revealed the SC joints, which at this time were normal (Fig. 5). The prednisolone was gradually withdrawn. She presented in 1978 with tender swollen SC joints and symptoms of PMR, and was included in the study. Bone scan revealed very high uptake in her SC joints (Fig. 6) and SC tomography now showed marked erosive changes (Fig. 7). She was treated

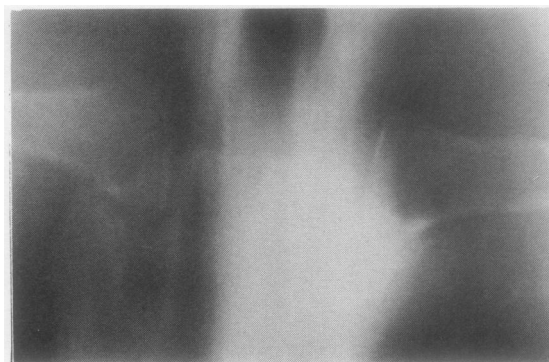


Fig. 5 Case 2. 1975. Normal SC tomogram.

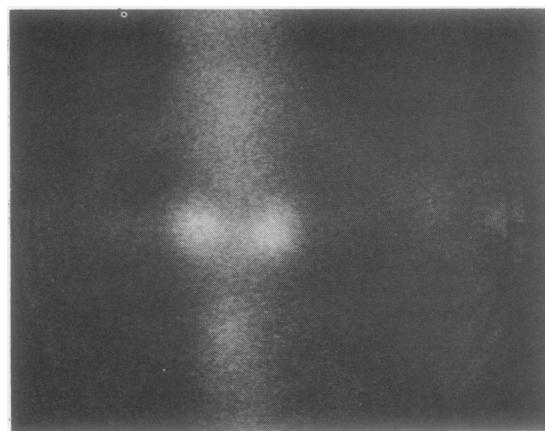


Fig. 6 Case 2. 1978. Bone scan showing increased uptake in both SC joints.



Fig. 7 Case 2. 1978. SC tomogram showing marked erosions.

with prednisolone again, with good results, and is now well on a small maintenance dose. Follow-up tomographs show no progression but increased sclerosis suggestive of healing.

### Conclusion

The SC joints are not easy to assess clinically, and pathology of these joints is missed unless specifically looked for.<sup>14</sup> Plain radiographs of these joints are hard to interpret, and radionuclide bone scans will show abnormalities only if a bone-seeking isotope is used and anterior views are taken.<sup>6</sup>

We have demonstrated that with careful clinical and radiographic examination abnormalities of the SC joints can be found in a significant proportion of patients with PMR, and that an erosive arthropathy of these joints occurs. Perhaps similar techniques applied to other 'central' joints would yield similar results. Our findings support the theory that the basic pathological process in PMR is an inflammatory arthropathy of the 'central' joints.

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