

# Spondylitis in Chronic Ulcerative Colitis

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A review of the roentgen films and hospital charts in 100 examples of chronic ulcerative colitis showed a 6 per cent prevalence of ankylosing spondylitis. There were no differences in the course or severity of the colitis that distinguished the patients with spondylitis from the entire group. The radiologic features of the spinal involvement were identical to those seen in ankylosing spondylitis. The concurrence of these two diseases is of interest from an etiologic viewpoint but is not explained.

Le scrutinio del roentgenogrammas e del tabulationes hospitalari in 100 casos de chronic colitis ulcerative revelava un incidentia de 6 pro cento de spondylitis ankylosante. Esseva notate nulle differentias in le curso o le severitate del colitis inter le casos con spondylitis e le gruppo total. Le aspectos radiologic del affection spinal esseva identic con illos incontrate in spondylitis ankylosante in general. Le occurrentia concomitante de iste duo morbos es de interesse ab le puncto de vista etiologic, sed illo remane sin explication.

**A**LTHOUGH it is generally appreciated that patients with chronic nonspecific ulcerative colitis frequently develop arthritis of peripheral joints, little attention has been given to the occurrence of spondylitis. Bywaters and Ansell<sup>1</sup> reported 37 patients in whom arthritis was associated with ulcerative colitis. In six of these, spondylitis was also present. McEwen and co-workers<sup>2</sup> discussed the serologic findings in 22 examples of arthritis with ulcerative colitis and noted that seven had quite characteristic ankylosing spondylitis. In Romanus' study<sup>3</sup> of 117 males with spondylitis, ulcerative colitis was described in three. Short et al.,<sup>4</sup> in their controlled studies on rheumatoid arthritis, included three patients with colitis, two of whom had spondylitis in addition to peripheral joint involvement. Steinberg<sup>5</sup> described six instances in which ankylosing spondylitis was associated with chronic nonspecific inflammatory lesions of the intestines and implied a possible etiologic relationship.

This study was prompted by our own observation that rheumatoid spondylitis sometimes accompanies ulcerative colitis. Our purpose was to determine the prevalence of spondylitis in the patients with colitis and to investigate any possible relationship between the two.

## METHODS

The basis for case selection was the index of coded roentgen diagnoses used by the Radiology Department of the University Hospital. One hundred examples of chronic non-

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specific ulcerative colitis were chosen at random from the group which had colon examinations between July, 1953 and June, 1958. The radiologic diagnosis was validated by review of the x-ray films. A supportive medical history had been given in each case. In 87 patients, the sigmoidoscopic examination substantiated the clinical impression. In four instances, the diagnosis was dependent upon the medical history and radiologic findings alone. Histologic confirmation was available in 47 patients.

The roentgen films of this group were studied specifically to detect evidence of spondylitis. In most cases it was necessary to rely on the films of the colon examination, but it was possible to appraise the sacroiliac articulations adequately in all but five instances. All patients suspected of having rheumatoid spondylitis on the basis of this radiologic screening method were requested to return for additional views. The clinical records of the entire group were consulted to determine the severity and course of the colitis, and special note was taken of extracolonic manifestations.

### CASE REPORTS

*Case 1 #772188.*—This 17 year old white female noted the onset of symptoms of colitis in 1953. These responded poorly to conservative management and a colectomy was required in 1957. X-rays of the colon in June, 1954 showed ulcerative colitis extending from the terminal few inches of the ileum to the proximal descending colon. By June of 1956, the disease had spread to involve the entire colon and rectum. Histologic examination of the material obtained at operation confirmed the diagnosis of chronic ulcerative colitis. The patient denied spinal or peripheral joint symptoms other than a single episode of low back pain in 1958. Physical examination in 1959 showed a loss of lumbar lordosis and some limitation of forward and backward bending. The peripheral joints were normal with the exception of definite clubbing of the fingers. The sacroiliac joints were not clearly depicted at the time of colon x-ray in 1954. At the time of examination in June, 1956, the sacroiliac joints showed indistinct bony margins with small erosions. X-ray examination of the spine in March of 1959 showed generalized demineralization and marginal irregularities at the sacroiliac joints with patchy areas of sclerosis in the subchondral bone. There was moderate flattening of the vertebral bodies, especially in the dorsolumbar region.

*Case 2 #451056.*—This 38 year old white male noted the onset of diarrhea in 1946. Sigmoidoscopic findings suggested the diagnosis of nonspecific ulcerative colitis and a barium enema examination showed changes involving the rectum and distal half of the colon. The colitis continued intermittently with moderate severity to 1954. Treatment has been conservative, without the use of steroids. Shortly after the onset of intestinal symptoms the patient noted the appearance of low back pain with radiation into the buttocks. Similar pains occurred with each exacerbation of the colitis.

Physical examination in 1959 showed no abnormalities of the spine or peripheral joints. X-ray examination of the spine in 1950 showed narrowing of the cartilage spaces of both sacroiliac joints, with marginal irregularities and patchy areas of sclerosis in the subchondral bone (fig. 1). Paraspinal ossifications were present in the dorsolumbar area, and the vertebral bodies in this region showed a squared appearance in the lateral view; costovertebral joint involvement was also evident (fig. 2). These abnormalities were again observed without change in March 1959. Physical examination at that time revealed no abnormalities of the spine or peripheral joints.

*Case 3 #314941.*—This 26 year old white male noted the onset of symptoms of colitis in 1954 which have continued to the present time with moderate severity. A barium enema examination in July of 1955 showed ulcerative colitis involving the entire colon, rectum, and a short segment of the terminal ileum. Pain in the low back began soon after the onset of colitis. A prominent symptom has been pain in the heels, but no other peripheral joint involvement has been noted. Physical examination in 1959 revealed tenderness and severe limitation of motion of the entire spine, most marked in the cervical area. Roentgen films of the spine in 1955 showed both sacroiliac joint cartilage spaces to be narrowed with indistinctness and irregularities of the margins of the subchondral bone. There were erosions at the symphysis pubis and inferior borders of the ischial tuberosities. Small para-

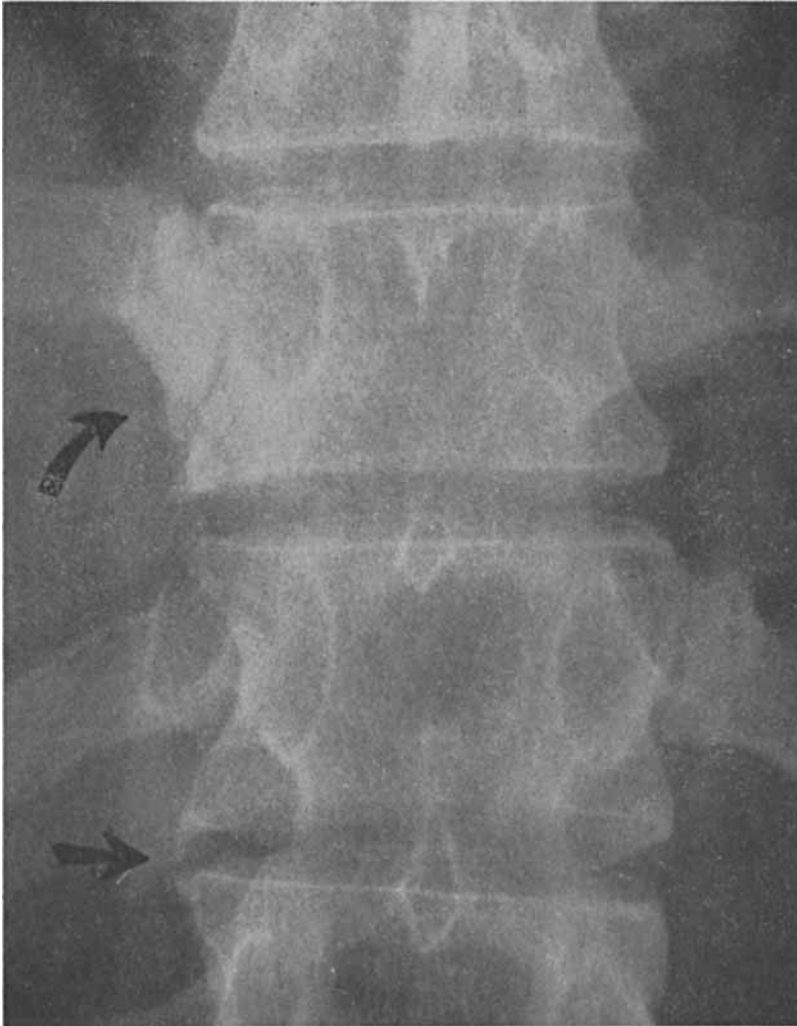


**Fig. 1.—Case 2. Narrowing of the cartilage spaces of both sacroiliac joints with marginal irregularities and patchy sclerosis in subchondral bone.**

vertebral ossifications were present in the lower dorsal spine. The margins of the lumbar facets were indistinct. A re-examination of the spine in January 1959 showed progression of these changes with bony fusion of the facets throughout the cervical spine (fig. 3), partial bony ankylosis of both sacroiliac joints, and virtually all of the lumbar apophyseal joints.

*Case 4 #849547.*—This 44 year old white male noted symptoms of low back pain with radiation into the buttocks for several years in the early 1930's. Back complaints have been absent since, with the exception of one similar episode in 1956. Colitis began in 1950 and has been continuous since. It has been mild and responds to conservative management without the use of steroids. Physical examination in 1959 showed slight loss of lumbar lordosis and limitation of motion in the lumbodorsal and cervical areas. The peripheral joints were normal. Colon examination by means of barium enema in August, 1956 was diagnostic of diffuse ulcerative colitis. Roentgen films of the spine showed indistinctness and irregularities of the osseous margins of both sacroiliac joints. Paraspinal osseous formations with intervertebral bridging were present in the upper lumbar region. Small erosions were noted at the inferior aspects of the ischial tuberosities. All these changes appeared more marked in March of 1959. Changes similar to those in the lumbar area were seen in the lower cervical spine at this time.

*Case 5 #838712.*—Colitis began in this 39 year old white female in 1952; this was complicated by the development of a rectovaginal fistula. Other symptoms of colitis have been minimal since 1954. Shortly after the onset of colitis she noted mild lowback aching, which has appeared intermittently up to the present time. Physical examination in 1959 revealed no abnormalities of the spine or peripheral joints. A barium enema examination in January, 1957 showed ulcerative colitis of the entire colon and rectum. The osseous margins of the sacroiliac joints were indistinct and irregular. There was osseous bridging along the paravertebral ligaments in the dorsolumbar region. Re-examination of the spine in March, 1959 showed marked narrowing of the spaces at the sacroiliac joints



**Fig. 2.—Case 2. Dorsolumbar junction. Paraspinal ossifications (lower arrow). Note sclerosis and irregularity of the eleventh right rib at the costovertebral junction (upper arrow).**

with partial bony ankylosis (fig. 4). Small erosions were present at the margins of the symphysis pubis. The paravertebral osseous formations were larger and intervertebral bridging more extensive (fig. 5A). Narrowing of the anterior portions of several intervertebral spaces in the dorsolumbar region had occurred, and there was evidence of “anterior spondylitis” as described by Romanus and Ydén (fig. 5B).<sup>1,2</sup>

*Case 6 #634490.*—This 41 year old white male noted the onset of diarrhea in 1944, at the age of 26, but the diagnosis of colitis was not made until 1948. Progressive symptoms were relieved in 1954 by partial colectomy and ileotransverscolostomy. In 1944 he noted the onset of low back pain which continued with moderate severity through 1952. Pain at the sternoclavicular and sternomanubrial joints was prominent at times. Acute redness, swelling and pain in the knees and ankles developed during a flare of the colitis in 1953. This subsided rapidly without residual joint changes. It was not possible to obtain follow-up



**Fig. 3.—Case 3. Cervical spine, lateral view. Bony ankylosis of apophyseal joints.**

information about this patient after 1954. Radiologic examination in April, 1948 showed ulcerative colitis involving the entire colon and terminal ileum. Osseous erosions with indistinct margins were seen in the sacroiliac joints and there were patchy areas of sclerosis in the adjacent subchondral bone (fig. 6). In addition, there were osseous formations bridging between vertebral bodies in the upper lumbar and lower dorsal region. Multiple skeletal examinations from 1948 to 1954 showed progression of these changes and erosions at the symphysis pubis, ischial tuberosities, right acromioclavicular, sternomanubrial and both sternoclavicular joints (fig. 7). The lower cervical spine showed changes similar to those noted in the dorsolumbar region.



Fig. 4.—Case 5. Para-articular sclerosis with partial bony obliteration of cartilage spaces of both sacroiliac joints.

#### RESULTS

Ankylosing spondylitis was initially suspected in nine patients on the basis of this radiologic survey. Of seven who were re-examined, five proved to have unequivocal roentgen signs of spondylitis. Of the two patients who were not re-examined, one had had diagnostic radiologic findings of spondylitis. Table 1 summarizes the age at onset of intestinal symptoms and the sex ratio for the entire group. There were 49 females and 51 males. Colitis began between the ages of 10 and 40 in approximately three fourths of the patients. Eight of the group were Negroes. Barium enema examinations in the patients with spondylitis showed involvement of the entire colon and short segments of the terminal ileum in five; in the remaining patient, the disease was limited to the rectum and descending colon.

Six patients were found to have spondylitis. Other than this complication they did not differ from those with colitis alone. Ulcerative colitis began between the ages of 11 and 36 in these six patients. Similarly, three fourths of the whole group observed the first symptoms of colitis between the second and fifth decades. The severity of the colitis was also comparable in the two groups, surgery having been required in two of the six patients with spondylitis, and in 44 per cent of the entire series.

The symptoms of spondylitis antedated the colitis by 15 to 20 years in one patient (Case 4). More commonly, in those with significant back complaints, symptoms began with or after the onset of colitis. The severity of

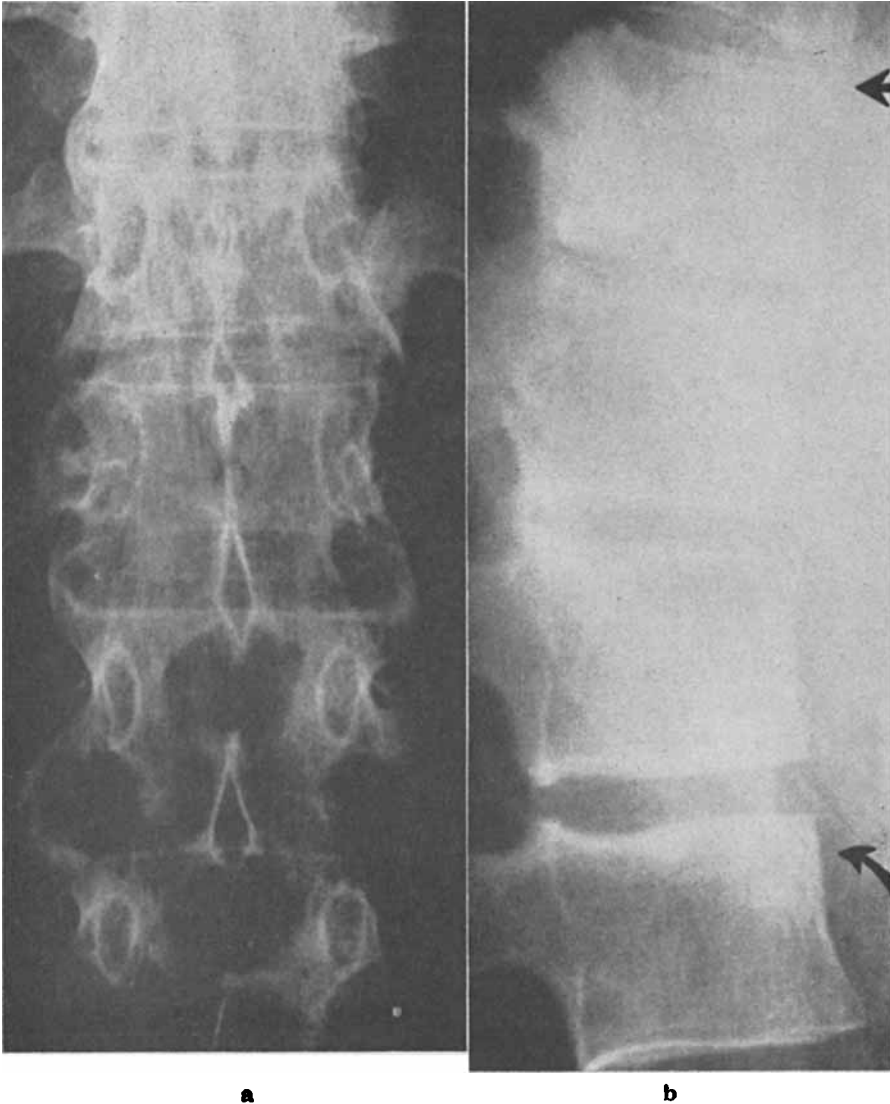


Fig. 5.—Case 5. Dorsolumbar junction. (a) Anteroposterior view. Extensive paravertebral ossification with “bridging.” (b) Lateral view. Narrowing of the anterior portion of several intervertebral spaces (upper arrow). Squaring of vertebral bodies, with so-called “shiny corner” (lower arrow).

the spondylitis varied considerably. Two patients with colitis of at least six years duration have been almost asymptomatic with only minimal findings on physical examination of the spine. Another has had typical symptoms of spondylitis intermittently for more than ten years. Examination of the spine at this time shows no limitation of motion, although radiologic changes of spondylitis are clearly demonstrable. In the remaining three patients, varying degrees of spinal limitation, from mild to severe, were present. Peripheral joint symptoms were described by only two of the six patients with spondylitis; one (Case 3) complained of painful heels, and the other (Case 6) had a

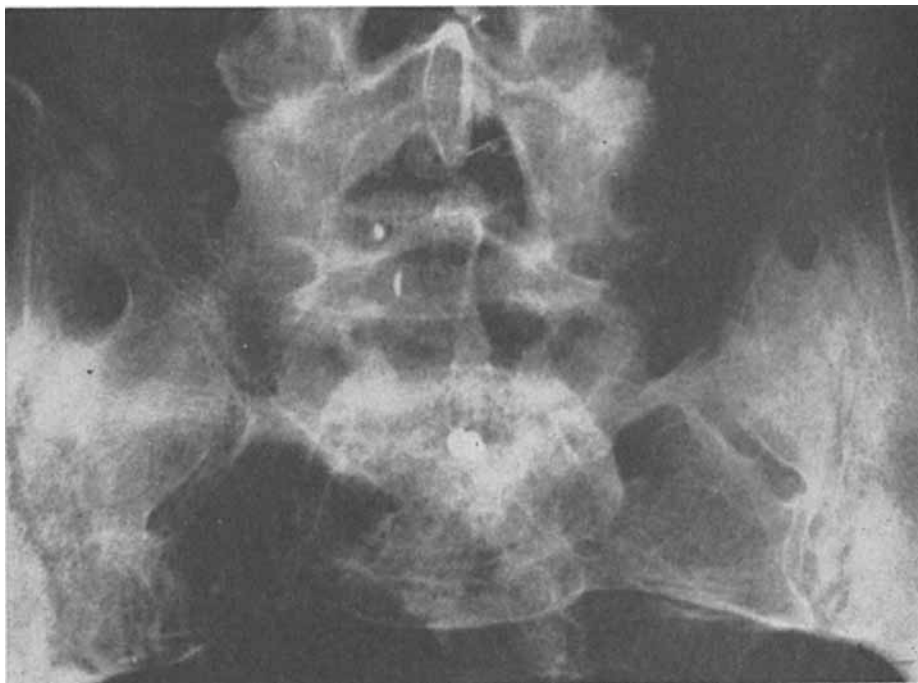


Fig. 6.—Case 6. Erosions at bony margins of both sacroiliac joints with para-articular sclerosis. Note erosions of right transverse process of L5.

single acute episode of redness, swelling and pain in the knees and ankles during a flare of the colitis. Other extracolonic complications were infrequent in the patients with spondylitis. Sheep cell hemagglutinations were performed in five of the six patients and all were negative.

The extracolonic manifestations in the 100 patients with chronic ulcerative colitis are summarized in table 2. Symptoms referable to peripheral joints were present in 25; of these, 13 had objective joint findings. Three patients of the latter group had sensitized sheep cell hemagglutination tests; all of these were negative. Synovial punch biopsy of the knee in two patients showed active chronic synovitis. None of these 13 patients exhibited subcutaneous nodules, and the joint symptoms began after the onset of colitis in all but one. In this case, involvement of multiple peripheral joints progressed rapidly, with bone destruction and limitation of motion. Ulcerative colitis occurred eight years later. The only other patient who developed joint contractures also showed bone changes radiologically. The clinical course in the remaining eleven patients was characterized by fleeting arthralgias and transient painful joint swelling, but in none of these was residual joint damage seen. A striking parallel between joint and intestinal symptoms was noted in some case histories, but in others these symptoms occurred independently. Clubbing of the fingers was noted in eight patients, three of whom had objective joint findings. Nine patients had stomatitis and four had conjunctivitis. Neither of these complications correlated with spinal or joint symptoms. Five of the six patients with erythema nodosum had complaints referable to joints,





Fig. 7.—Case 6. Marginal osseous erosions at sternoclavicular (upper arrow) and sternomanubrial (lower arrow) joints.

and four of these showed evidence of synovitis. Arthralgia, sometimes with arthritis, was observed in four of six additional patients who also showed skin lesions of various types.

#### DISCUSSION

The occurrence of two uncommon diseases in any one patient may represent a curiosity. It would appear that the concurrence of ulcerative colitis with spondylitis is too frequent to be explained by chance.

Most studies which give the prevalence of arthritis in patients with colitis do not separate those having spondylitis. Hightower,<sup>6</sup> however, reported two examples of ankylosing spondylitis in a series of 220 patients with ulcerative colitis. Flood<sup>7</sup> mentions two in a similar group of 148 patients. In comparing our findings with these reports, it should be emphasized that the symptoms of

Table 1.—Age at Onset of Symptoms of Chronic Ulcerative Colitis

Age by decades	0-10	10-20	20-30	30-40	40-50	50-60	60+
Male (51)	2	16	18	4	6	3	2
Female (49)	1	13	17	10	6	1	1
Total (100)	3	29	35	14	12	4	3

Table 2.—Extracolonic Manifestations in 100 Patients with Chronic Nonspecific Ulcerative Colitis

	Number	Objective peripheral joint findings
Arthralgia	25	13
Clubbing of digits	8	3
Stomatitis	9	0
Eye disease	4	0
Erythema nodosum	6	4
Other skin lesions	6	2
Spondylitis	6	1

ankylosing spondylitis are often unrecognized for long periods. The roentgen signs may be overlooked, especially when the radiologist's attention is not directed to the spine. A study to determine the frequency of association of these two diseases is not reliable, unless a special attempt is made to detect the presence of spondylitis. For example, in four of the six patients in this series, spondylitis was not initially detected radiologically, and in three of these the diagnosis probably would not have been suspected from clinical examination alone.

The small number of patients described does not permit statistical conclusions, but certain impressions are gained. The course and extent of colonic involvement was not more severe in the six patients with spondylitis than in those with ulcerative colitis alone. The lower colon and rectum were involved in all six patients. The age at onset of intestinal symptoms was comparable to that of the entire group. Of notable interest was the lack of correlation of spondylitis with other extracolonic manifestations. Peripheral joint symptoms and skin lesions in patients with ulcerative colitis, especially erythema nodosum, frequently occur together.<sup>1,8,9</sup> Such a correlation was not demonstrable in these patients with spondylitis.

The radiologic features of the spinal involvement were observed to be identical with those seen in ankylosing spondylitis. The sacroiliac joints showed typical changes in all six patients; there was partial bony ankylosis in two of these. Characteristic paraspinal osseous formations, so-called syndesmophytes, showing a tendency to bridge between vertebral bodies, were seen in five patients. These were most marked and most frequent near the dorsolumbar junction. Erosions of bone at the symphysis pubis were evident in three instances; in a like number, similar erosions were seen at the inferior borders of the ischial tuberosities. The posterior intervertebral articulations were difficult to evaluate, but bony ankylosis was clearly present in one patient. The cervical spine was involved in two. One patient showed erosions at the acromioclavicular, sternoclavicular and sternomanubrial joints.

The radiologist can aid materially in the diagnosis of spondylitis by conscientiously examining the spine on films of colon examinations in cases of ulcerative colitis. Although earliest changes occur in the sacroiliac joints, suspicion should be aroused by the finding of typical syndesmophytes, especially in young adults. This screening procedure can be quite informative, but a final radiologic diagnosis, except in advanced cases, requires special views of the spine.

The association of these two diseases remains an enigma, although several theories may be advanced. One may postulate a cause and effect relationship. Steinberg<sup>5</sup> implies that the spondylitis may be due to the passage of an infectious agent through the diseased bowel wall into the pelvic veins which anastomose with the vertebral plexus. In support of this, he cites Romanus' concept that in like manner spondylitis originates with an infectious process in the genitourinary system. It may be argued, however, that in some patients, spondylitis antedates symptoms of colitis by a number of years. It is of interest that spondylitis has been seen in association with regional enteritis,<sup>10</sup> and Eyler and Doub<sup>11</sup> have observed changes in the sacroiliac joints in two of four patients with Whipple's disease. It is conceivable that this relationship with ulcerative colitis is coincidental, although this view is not supported by our findings. As a control study, a review of 100 films of the pelvis showed no examples of ankylosing spondylitis. The two diseases may have a common genetic or immunochemical defect, or the presence of one may indirectly predispose the patient to the other. To date there is insufficient evidence to support any of these hypotheses.

#### SUMMARY

1. Six examples of ankylosing spondylitis were found in 100 patients with chronic nonspecific ulcerative colitis.
2. There were no differences in the course or severity of the colitis which distinguished the patients with spondylitis from the entire group.
3. The radiologic features of the spinal involvement are identical with those observed in ankylosing spondylitis without ulcerative colitis.
4. In patients with ulcerative colitis the diagnosis of spondylitis can be suspected by careful examination of films of the colon examination.

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