

# Orthopaedic Experience on Inflammatory Bowel Disease (Lesniowski-Crohn's Disease and Ulcerative Colitis)

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## SUMMARY

**Background.** Inflammatory bowel disease (IBD) is a group of inflammatory conditions of the gastrointestinal tract. The major types of IBD are Lesniowski-Crohn's disease (L-CD) and ulcerative colitis (UC). Inflammatory bowel disease (IBD) sometimes presents with arthritic manifestations. The peripheral arthritis is a problem for the orthopaedist and the physiatrist

**Material and methods.** The authors retrospectively reviewed 65 Sicilian patients with IBD (38 with UC, 27 with L-CD) over a period of 5 years. All patients underwent clinical examinations, laboratory and imaging studies, and were screened for the presence of the rheumatoid factor. All patients also attended eight to ten 50-minute sessions of physiotherapy over a six-week period.

**Results.** 38 patients had UC (mean age 42.1 years, range: 19-75) and 27 patients had L-CD (mean age 37.2 years, range: 17-64 years). Arthritis occurred in 11 patients (17%): 7 with UC (18.4%) and 4 with L-CD (14.8%). The mean age of patients with arthritis was 35 and mean duration of pain and functional limitation was 28 months. In 9 patients, arthritis appeared after the onset of bowel symptoms with a mean duration of 20 months in UC and 24 months in L-CD; in two patients, arthritis preceded the onset of bowel symptoms for several months. Exercise and manual therapy did not bring about good symptomatic improvement in patients with shoulder pain; good short-term results were only noted for patients with knee and hip arthritis.

**Conclusions.** 1. The association between IBD and arthritis has been reported in the literature and confirmed in our study. 2. The role of the orthopaedist is to eliminate pain and dysfunction. 3. Physical therapy is an optimal initial approach. 4. Prosthetic surgery should be chosen as a final option when medical and manual therapies are no longer able to improve the quality of life of the patient.

**Key words:** inflammatory bowel disease, arthritis, Crohn's disease, Ulcerative colitis



## BACKGROUND

Ulcerative colitis (UC) and Lesniowski-Crohn's disease (L-CD) form a group of idiopathic chronic inflammatory disorders involving the small and the large intestine [1,2]. L-CD involves all parts of the digestive tract (from mouth to anus). Furthermore L-CD is discontinuous, with skip areas interspersed between one or more involved areas. In UC the inflammation always begins in the rectum, extends proximally a certain distance and then abruptly stops. IBD is complicated by many local and systemic disorders. Among the extraintestinal complications of IBD arthritic manifestations are the most common [3]. Arthritis associated with IBD may be divided into three clinical categories: peripheral arthritis, spondylitis, and sacroileitis [4].

Radiographic sacroileitis is seen in about 12% of patients with IBD, while spondylitis is found in about 5% of patients [5,6]. Peripheral arthritis occurs in 15-20% of patients with IBD. The arthritis tends to be asymmetrical, often migratory, running more or less parallel with IBD and should not be confused with rheumatoid arthritis [7]. The main symptoms are pain, swelling and stiffness in one or more joints of the arms and legs (wrists, knees and ankles) that may migrate between joints. Current clinical practice guidelines for the conservative management of arthritic manifestations promote a combination of pharmacologic and non-pharmacologic interventions [8,9]. Considering the adverse effects linked with chronic non-steroidal and steroidal anti-inflammatory drug use such as gastrointestinal bleeding and cardiovascular disease, non-pharmacological management options are often emphasized [10]. Physical therapy has been recommended to slow the progression of arthritis with a focus on addressing the individual's impairments and faulty movement patterns [11,12]. Common manual interventions including clinician-administered stretching of leg and spinal musculature and variations of a long axis distraction manipulation have shown positive effects on pain, ROM, and various outcome measures including the VAS and WOMAC Score [13].

## MATERIAL AND METHODS

65 patients with IBD were retrospectively studied at the Orthopaedic Outpatient Division of the University of Palermo from 2004 to 2008. Diagnosis of IBD (UC and L-CD) was made according to accepted clinical, endoscopic, radiological and histological criteria, or was confirmed at surgery, in agreement with criteria described by Schachter and Kirsner [14]. X-ray studies were made using a standard tech-

nique. The radiographic results of sacroileitis were graded according to Bennet and Burch (15) as 0 = normal, 1 = suspicious sacroileitis, 2 = abnormal joint with sclerosis and/or erosions, 3 = unequivocally abnormal with erosions, sclerosis, widening or narrowing or partly ankylosed, 4 = total ankylosis. The results of a latex fixation test for rheumatoid factor (RF) were recorded in patients with joint symptoms. Arthritis was defined as joint pain associated with stiffness and swelling stimulated by motion during the examination. Patients with pain and functional impairment to the shoulder, knee, or hip were treated with exercise therapy and manual therapy. Exercise therapy can comprise joint-specific exercises for range of motion, strengthening of muscles around the hip and general aerobic conditioning. It can take place on land or in water (hydrotherapy) and can be done in a supervised setting or as a home-based self-directed programme [16]. All patients attended eight to ten 50 minute sessions of physiotherapy over a six-week period. A session included 30 minutes of exercise therapy and 15 minutes of manual therapy. A choice of manual therapy techniques was used which were based on the pain/stiffness relationship as well as the movement restrictions of the affected shoulder, hip, knee, or ankle. These were ascertained by a blinded outcome assessor to ensure standardization and were communicated to the treating therapists on a referral form. Treating therapists could choose from a list of manual therapy techniques based on Mulligan, Cyriax and proprioceptive neuromuscular facilitation (PNF) [17,18]. Outcome measures included physical function (WOMAC), VAS scale (numerical pain rating scale), and patient satisfaction in 0, 4 and 8 weeks.

## RESULTS

Of the 65 patients with IBD, 38 patients had UC (mean age 42.1 years, range: 19-75) and 27 patients had L-CD (mean age 37.2 years, range: 17-64 years). There were more female patients in the UC group (M: F = 14 : 24) than in the L-CD group (M : F = 12 : 15) (Tab. 1). In L-CD, arthritis did not occur in patients without colitis. Predominant symptoms were abdominal pain and weight loss; sporadically diarrhoea and haematochezia. Only one case of a skin disorder, pyoderma gangrenosum, was observed (incidence of 1.53%). Arthritis occurred in 11 patients (17%): 7 with UC (18.4%) and 4 with L-CD (14.8%). The mean age of patients with arthritis was 35 and mean duration of pain and functional limitation was 28 months. In 9 patients, arthritis appeared after the onset of bowel symptoms with a mean duration of 20 months in UC and 24 months in L-CD; in two pa-

Tab. 1 Clinical manifestations in patients with inflammatory bowel disease

	Ulcerative colitis	Crohn's disease
Number Patients	38	27
Mean Age	42,1	37,2
Arthritis	7	4
Weight loss	19	22
Diarrhoea	35	21
Pyoderma Gangrenosus	1	-

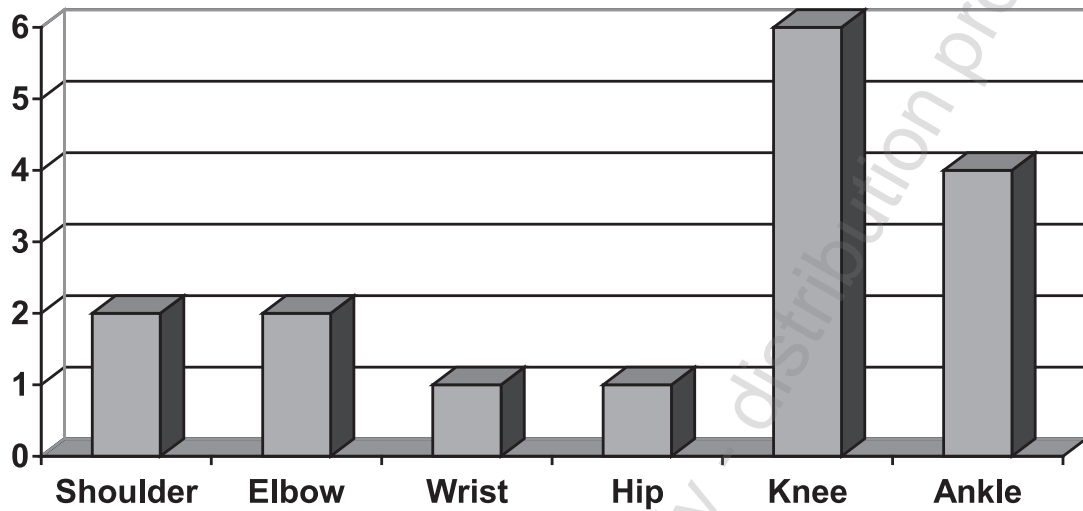


Fig. 1. Affected joints in patients with arthritis

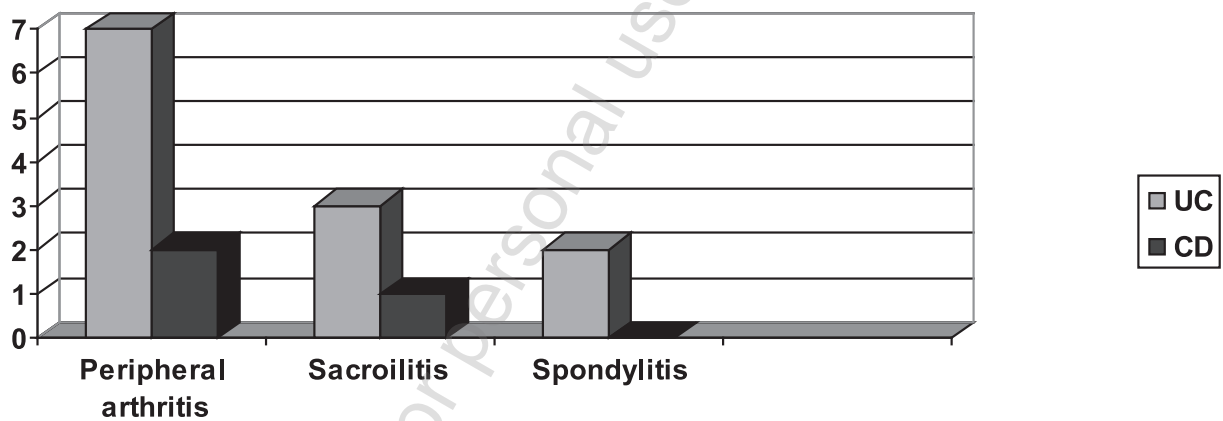


Fig. 2. Joint manifestations in IBD

Tab. 2. Clinical measurements

	Weeks	VAS			WOMAC		
		0	1	6	0	1	6
Shoulder	3	4	4	4	74	70	64
	2	4	5	70	64	60	60
Knee	6	8	10	80	72	62	62
	4	6	6	82	70	60	60
	4	6	8	80	66	56	56
	3	5	8	84	72	60	60
	5	8	6	84	70	80	80
	3	4	4	76	74	74	74
Hip	4	5	5	86	80	78	78



tients, arthritis preceded the onset of bowel symptoms for several months. The arthritis in IBD was seronegative (negative RF) except one patient who showed low titer RF (22 IU/ml) and monoarticular involvement. The patients with arthritis showed a higher erythrocyte sedimentation rate ( $51 \text{ mm/hr} \pm 22$ ) and C-reactive protein ( $23 \text{ mg/L} \pm 13$ ) compared to the patients without arthritis. Peripheral arthritis was found in 9 patients (13.8%); 7 patients with UC (18.4%) and 2 patients with L-CD (7.40%). The most frequently involved joint was the knee joint (6 patients), followed by the ankle (4 patients), elbow (2 patients), wrist (2 patients), shoulder (2 patients), hip (1 patient) (Fig. 1). Spondylitis was diagnosed in 2 patients (3.07%) with inflammatory back pain and radiologic sacroileitis grade 3. Sacroiliac joint abnormality was observed in 4 patients (6.15%), 3 with UC and 1 with L-CD. Of these, one patient was classified as grade 1, two patients as grade 2, one patient as grade 3 (Fig. 2). Both peripheral arthritis and spondylitis were found in three patients (only UC patients); both peripheral arthritis and sacroileitis in two patients (one with UC and one with L-CD).

All patients with arthritis started and completed the study, attended all clinical appointments and reported for testing at 0, 4, and 6 weeks and after one year. The patients with shoulder pain did not have a good symptomatic improvement and it was decided to perform infiltrative therapy with a corticosteroid. Good short-term results were noted for patients with knee and hip arthritis, but at the one-year follow-up symptom intensity was as before and it was decided that joint replacement surgery should be performed in all patients except two who chose to perform another course of manual therapy (Tab. 2).

## DISCUSSION

L-CD and UC are inflammatory chronic diseases that can cause extraintestinal complications. A patient with inflammatory bowel disease can present many symptoms and many clinical manifestations, which often are the first signal of the disease. The extra-intestinal manifestations are painful and cause limitations in activities. The articular manifestations of L-CD have been characterized by many investigators since they were first described by Bargen in 1929 [19]. Most series of patients with IBD have estimated the frequency of joint involvement to be 2-16% in L-CD and 5-26% in UC [18,19]. In the present study, the overall incidence of arthritis was 14.8% in L-CD and 18.4% in UC.

Scarpa et al. however, showed a strong reverse relationship between the number of affected joints

and the extent of colitis and suggested that the extent of the intestinal lesion in UC seems to be important in the expression of the articular complications [20]. In 9 patients with peripheral arthritis associated with IBD, pancolitis was involved in 5 and rectosigmoid disease in 3. There was no difference in the incidence of arthritis according to the extent of bowel involvement in UC. In literature the incidence of RF positivity is not higher in patients with IBD and peripheral arthritis than in the general population [21,22]. In the present study only one patient with monoarticular involvement showed low titer RF. In IBD, sacroileitis is the most important extra-intestinal manifestation, but the involvement of joints such as shoulder, hip, knee reduces the quality of life of the patients with pain and reduces articular function. In the literature there are cases of infectious arthritis associated with IBD, for example Łukjanowicz M. et al report a case of fungal spondylodiscitis in a patient with ulcerative colitis; we did not observe viral, bacterial or fungal infection in our study [23].

If possible, treatment focuses on eliminating the underlying cause of the arthritis. However, the cause is not necessarily curable, as with osteoarthritis and rheumatoid arthritis. Treatment, therefore, aims at reducing pain and discomfort and preventing further disability. Treatment options vary depending on the type of arthritis and include physical therapy, lifestyle changes (including exercise and weight control), orthopaedic bracing, medications, and dietary supplements (symptomatic or targeted at the disease process causing the arthritis). Joint replacement surgery may be required in erosive forms of arthritis. Medications can help reduce inflammation in the joint which decreases pain. Moreover, by decreasing inflammation, the joint damage is slowed. Physiotherapy plays an important role in managing arthritis. It can help the patient to maintain independence through improved mobility, strength and flexibility. Used along with medication it can help to minimise pain and encourage independence [24,25]. Most people who have arthritis may never need surgery. However, if joints are very damaged and other treatment is not helping, surgery may be suggested. If this is the case, the patient is referred to an orthopaedic surgeon. Joint replacements are the most common form of surgery for arthritis, with hip and knee replacements the most popular.

IBD is a disorder that can have many complications, both within and outside of the intestinal tract. The association between IBD and arthritis has been reported in the literature and confirmed in our study, but the basis of this association is unknown. Both infection and immune mechanisms have been postu-

lated, Hodgdonet et al. have demonstrated anti-complement activity, suggesting immune complexes, in the serum of patients with active IBD and acute arthritis. A better understanding of the role of genetics and environmental factors in the aetiology of L-CD will improve the treatments and prevention of the disease. The aim of treatment is to reduce the pain and functional limitation of the affected joints. For us, physical therapy and rehabilitation is an optimal initial approach, it can actually improve the function of the affected joints and reduce pain. Prosthetic surgery should be chosen as the final option when

medical and manual therapies are no longer able to improve the quality of life of the patient.

## CONCLUSIONS

1. The association between IBD and arthritis has been reported in the literature and confirmed in our study.
2. The role of the orthopaedist is to eliminate pain and dysfunction.
3. Physical therapy is an optimal initial approach.
4. Prosthetic surgery should be chosen as a final option when medical and manual therapies are no longer able to improve the quality of life of the patient.

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