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# Non-Infectious Pyogenic Arthritis after a Blind-Loop Intestinal-Bypass Operation

## A CASE REPORT\*

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Pyogenic arthritis after an intestinal-bypass procedure for morbid obesity is so well recognized that it is termed bypass arthropathy in the rheumatology journals<sup>5,6</sup>. However, we have found no reports of this condition in the orthopaedic literature; it has been noted to occur after a jejunocolostomy<sup>10</sup>, a jejuno-ileostomy<sup>3</sup>, and, more recently, after a procedure for peptic ulcer<sup>7</sup>. We present the case of a patient in whom an acute aseptic pyogenic arthritis developed five years after she had had an intestinal-bypass operation for morbid obesity.

### Case Report

A forty-two-year-old woman was admitted to the hospital because of pain and swelling in the right knee. The thigh and leg were also swollen, just adjacent to the knee. Six weeks before she was first seen, the patient had begun treatment for a thrombosis of the deep veins in the right calf, and she was taking anticoagulants orally. The swelling in the leg had not subsided, however. One week before she was admitted, the swelling had increased, and she had pain in the knee as well as an intermittent fever and chills. There was no history of trauma or arthritis.

The patient's medical history was noteworthy only in that an intestinal-bypass procedure for morbid obesity had been performed five years earlier; she had lost 88.5 kilograms (195 pounds) as a result.

Physical examination revealed a woman who was slightly overweight and in severe distress secondary to pain in the right knee. On admission, she had a fever with a temperature of 37.8 degrees Celsius. The knee was markedly swollen, but there was no erythema. A tense effusion was palpable, and the knee was warm to the touch. Mobility of the knee was decreased considerably and all motion was painful. The thigh and leg were also swollen. The right leg had a positive Homans sign. Radiographs revealed only a large effusion in the suprapatellar region.

Aside from mild leukocytosis, with a mild shift to the left on the differential white blood-cell count, and an elevated erythrocyte sedimentation rate (fifty-four millimeters per hour), all laboratory examinations, including the rheumatoid factor and the antinuclear antibody, were within normal limits. Cultures of blood were negative.

The knee was aspirated, and eighty-five milliliters of fluid was removed. This showed no crystals or red blood cells on smear. The white blood-cell count was 67,000 per cubic millimeter ( $6.7 \times 10^9$  per liter) with 94 per cent polymorphonuclear leukocytes. A gram stain for bacteria was negative, as were cultures for aerobic, anaerobic, and neisserial organisms.

After the aspiration, intravenous administration of cephalosporin was begun. Because the pain in the knee had persisted, anticoagulant therapy

was discontinued, and arthroscopic irrigation and débridement of the knee was done. Postoperatively, anticoagulant medication was resumed with intravenous administration of heparin.

The findings at arthroscopy were those of inflammation. There were abundant fibrinous adhesions and a marked synovitis. Specimens of tissue and fluid that were taken at arthroscopy were sterile, and a gram stain of material taken intraoperatively was negative.

Postoperatively, the pain was relieved and the range of motion improved. Consultation elicited a differential diagnosis of either seronegative spondyloarthropathy or bypass arthritis. The former was ruled out because radiographs showed the sacro-iliac joints to be well preserved, with no evidence of arthritis, and the serum cryoglobulin was negative. However, the serum cryofibrinogen was positive, and the cryoglobulin hematocrit of the plasma was elevated. These laboratory findings, along with the patient's history of an intestinal-bypass operation, were sufficient to establish the diagnosis of blind-loop arthritis syndrome. The patient was given Indocin (indomethacin) and the symptoms resolved. She was discharged from the hospital on the seventh postoperative day. To date, the symptoms have not recurred.

### Discussion

In 1963, Payne et al. first reported on the success of a jejunocolostomy in the treatment of morbid obesity and noted the many complications that can accompany this procedure. Because of this associated morbidity, many surgeons began performing a jejuno-ileal bypass procedure, again with favorable results<sup>1</sup>. This operation, however, was also associated with numerous systemic complications<sup>4</sup>, and it was abandoned for procedures of less morbidity, such as gastric stapling.

In 1971, Shagrin et al. described the development of symptoms of arthritis after an intestinal-bypass procedure in 23 per cent of their patients. Other studies have indicated an incidence as high as 52 per cent<sup>2</sup>. The onset of the symptoms can occur months to years after the operation<sup>11</sup>.

Accompanying features of blind-loop arthritis syndrome include a cutaneous lesion, paresthesias, Raynaud phenomenon, fever, and pericarditis. The joints that are most commonly affected are the knee, ankle, finger, wrist, and shoulder, in decreasing order of frequency; patients may have involvement of multiple joints<sup>11</sup>.

The cause of the inflammatory condition is not known but is believed to be the result of immune mechanisms directed against antigens found on intestinal flora, especially *Escherichia coli* and *Bacteroides fragilis*<sup>13</sup>. Several authors have documented increased levels of complement that contains cryoprecipitates as well as circulating immune com-

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plexes in affected patients<sup>9,11,14,15</sup>. These complexes are present during the acute phase of arthritis but are absent when the clinical symptoms resolve<sup>13</sup>. The blind loop of the small intestine in a patient who has elected to have a reanastomosis is seen to be dilated and edematous; neighboring lymph nodes are enlarged and reactive. Coliform antigens could, theoretically, reach the systemic circulation through the inflamed wall of the bowel, deposit in the target tissues, and precipitate the immune reaction<sup>11</sup>. The synovial fluid of some patients has been shown to contain immune complexes<sup>12</sup>.

Treatment of blind-loop syndrome is directed toward relief of symptoms, and the clinical symptoms are not always easily alleviated. Rest and non-steroidal anti-inflammatory drugs are attempted first. Antibiotics have been

effective in some patients. Occasionally, corticosteroids are needed to suppress the symptoms of arthritis or the rash. If conservative treatment fails, reanastomosis of the blind loop may be needed, and that usually relieves the symptoms<sup>3</sup>.

The role of the orthopaedist in the diagnosis and treatment of arthritis associated with an intestinal-bypass operation is obvious. The importance of a complete medical history is clearly demonstrated in our patient, as the diagnosis was missed until the clinical picture was correlated with the patient's history of an abdominal procedure.

In the case of our patient, the need for arthroscopic lavage of the knee joint may be questioned, because treatment with non-steroidal anti-inflammatory medications and antibiotics, especially tetracycline, usually results in resolution of the synovitis.

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