SPLENIC NEUTROPENIA IN FELTY'S SYNDROME

BY

J. N. BLAU, M.B., M.R.C.P.

Late Medical Registrar, Mount Vernon Hospital

AND

A. WILLCOX, M.D., F.R.C.P.

Physician, the Middlesex Hospital and Mount Vernon Hospital

Felty (1924) described the cases of five patients who had rheumatoid arthritis, splenomegaly, and leucopenia. The concept of primary splenic neutropenia was formulated by Wiseman and Doan (1942) when they recorded five cases of neutropenia and splenic enlargement in which a normal white blood count was restored by splenectomy. Gauld (1949) described the success of splenectomy in a woman aged 38 with mild rheumatoid arthritis, splenomegaly, and severe neutropenia. This resembles in many ways the case described below.

Case Report

A retired female clerk aged 68 was admitted to Mount Vernon Hospital on December 1, 1955. She had been feverish and vaguely ill since an attack of herpes zoster in May. Twenty years ago she had had recurrent iritis and pyelitis. For four years she had had epigastric and retrosternal pain after meals, on stooping, and when in bed; she had vomited blood and passed a melaena stool twice during the previous seven months. Rheumatoid arthritis began in 1948, starting in the hands and gradually involving most joints. It had been treated by heat, massage, and aspirin, and had caused few symptoms in recent years. It was not a serious trouble to her on admission. The only medicines she had taken were antacid tablets and soluble aspirin. Her mother had suffered from arthritis of the knees, ankles, and shoulders in her later years and died of pneumonia, aged 73.

On examination the patient was obese and pale, with mild rheumatoid arthritis of the hands. The liver extended one fingerbreadth and the spleen three fingerbreadths below the

costal margin. The lymph nodes were not enlarged. The left eye had been damaged by iritis. Other systems were normal, but she was pyrexial; temperature 99.8° F. (37.7° C.), pulse rate 112.

The results of investigations were as follows: Hb, 55%; red cells, 4,140,000 per c.mm.; reticulocytes, less than 1%; P.C.V., 29%; M.C.V., 77 cubic microns; M.C.H., 33 µg.; M.C.H.C., 25%; red-cell fragility, serum bilirubin, and urobilinogen in the urine all normal; occult blood in the faeces, negative; E.S.R., 31 mm. in one hour (Westergren); Wassermann reaction negative; barium meal x-ray film showed a small hiatus hernia.

A constant granulopenia and thrombocytopenia was found. The variations are shown in Fig. 1. On December 9 the white cells numbered 1,000 cells per c.mm., with only 60 polymorphs per c.mm. The platelets were 92,000 per c.mm.

A biopsy of the bone marrow showed a moderately cellular marrow with a shift to the left in the granular series, normoblastic erythropoiesis, and a myeloid/erythroid ratio of 2.1:1. Megakaryocytes were scanty, and some of the mature ones showed no granularity.

Cortisone was given for 15 days, starting with 300 mg. daily, the dose being gradually reduced. It caused no change in the blood count, but relieved the joint pains. She developed several infections, which included acute bronchitis (*Staphylococcus aureus* in the sputum), aphthous stomatitis, pharyngitis, laryngitis, and cellulitis of the arm. Penicillin was ineffective, but tetracycline caused a remission of fever and infection.

Mr. Ralph Marnham removed the spleen on January 24, 1956. It weighed 705 g. The cut surface was dark pink, with loss of the normal pattern. Microscopy showed non-specific hyperplasia of the pulp widely separating the Malpighian bodies. The sinusoids were congested, with increased cellular components, including reticulum cells.

The changes in the white blood count immediately after operation are shown in Fig. 2. The total number of polymorphs did not become normal until five and a half hours after the splenic pedicle was tied, when the count was: leucocytes, 4,200 (polymorphs 67%, lymphocytes 23%, monocytes 10%). The platelet count rose persistently until it reached 1,060,000 on the eleventh day after operation.

Post-operative progress was uncomplicated except for thrombophlebitis in the right calf, which resolved quickly with firm bandaging. Fifteen days after splenectomy the

FIG. 1.—White blood counts before and after splenectomy.

bone marrow showed a myeloid/erythroid ratio of 11:1. A relative increase in myelocytes was still present. When she left hospital on February 10 she had been free from infections since splenectomy and was in good health.

She was readmitted on May 26 for repair of a uterine prolapse. Since leaving hospital in February she had had

FIG. 2.—White blood count during the immediate post-operative period.

no further infections. The arthritis has not been unusually troublesome. The physical findings were unchanged. Blood counts (Fig. 1) showed a total number of white cells which was normal (between 6,000 and 8,000), but the percentage of polymorphs was often low, ranging between 20 and 60%. The number of polymorphs, however, was always above 1,500 per c.mm. The sternal marrow on June 21 was normal, with a myeloid/erythroid ratio of 5.5:1.

The prolapse was repaired by Mr. Arthure on June 21. Convalescence was interrupted by a respiratory infection, a burst abdomen, congestive heart failure, and an axillary vein thrombosis. However, she overcame these complications and left hospital on August 28.

When last seen, in June, 1957, she was well, apart from mild rheumatoid arthritis, and her blood count was normal.

Discussion

The severe leucopenia originally found in this patient was associated with crippling ill-health because of repeated infections, many of them serious. A few hours after splenectomy the leucocyte count became normal, and remained so, although the granular cells were sometimes at the lower limit of the normal range. The tendency to infection was successfully corrected. The rheumatoid arthritis was unaffected, remained mildly active, and may have been the cause of the occasional low neutrophil counts. Hutchison and Alexander (1954) describe a similar case of a woman of 50 who had had rheumatoid arthritis for twenty years. She was repeatedly admitted to hospital between 1950 and 1953 with infections and a persistent leucopenia, the neutrophil count ranging from nil to 730 per c.mm. An enlarged spleen, weighing 300 g., was removed in February, 1953, whereupon the leucocyte count rose to 5,000 per c.mm., the neutrophils to 2,500. Microscopy of the spleen showed no evidence of excessive phagocytosis, and neutropenia was thought to be due to maturation arrest. They review the literature concerning splenic neutropenia, and consider in particular the 21 cases recorded in which splenectomy led to recovery. The spleen showed signs of excessive phagocytosis in 11, 6 of whom had rheumatoid arthritis; in the other 10, of whom 2 had rheumatoid arthritis, the spleen did not show phagocytosis, but there was evidence of maturation arrest. In our patient the signs also were more suggestive of maturation arrest than of excessive phagocytosis.

Splenic neutropenia should therefore be considered when a patient with Felty's syndrome has repeated infections,

persistent fever, and ill-health which may be prolonged (Doan, 1955). The improvement after splenectomy can be impressive.

Summary

The results of splenectomy are described in a woman aged 68 with Felty's syndrome and neutropenia.

Rheumatoid arthritis had been present for seven years; its activity was unaltered by the operation.

She was admitted to hospital because of recurrent fever following an attack of herpes zoster seven months previously. Hepatomegaly and splenomegaly with a persistent leucopenia (total count usually below 2,000 per c.mm.) and granulopenia (polymorphs below 100 per c.mm.) were found; the leucocyte count was unaffected by treatment with cortisone. She developed many infections during the next six weeks.

Splenectomy was performed, the spleen weighing 705 g. and showing non-specific hyperplasia of the pulp with congested sinusoids.

Four hours after the splenic pedicle was tied the leucocyte count rose to 4,200 per c.mm. and has since remained at a normal level. The polymorphs have ranged between 60% and 20%, but the total has always been above 1,500 per c.mm. The patient has been afebrile and free from infections.

REFERENCES

- Doan, C. A. (1955). In R. L. Cecil and R. F. Loeb's *Textbook of Medicine*, p. 1156. Saunders, London.
 Felty, A. R. (1924). *Johns Hopk. Hosp. Bull.*, 35, 16.
 Gould, W. R. (1949). *Lancet*, 2, 989.
 Hutchison, H. E., and Alexander, W. D. (1954). *Blood*, 9, 986.
 Wiseman, B. K., and Doan, C. A. (1942). *Ann. intern. Med.*, 16, 1097.

Medical Memorandum

Infection of Bone and Joint by Salmonellae

Abscesses and bony infections caused by the more invasive salmonellae, such as *Salmonella typhi*, are well known; it is not common, however, to find systemic infections of this nature caused by the less invasive members of the group, such as *Salm. typhimurium*. Neither are reports of such infections by *Salm. cholerae suis* frequent in this country (Boycott and McNee, 1936; Schwabacher, Taylor, and White, 1943; Laylee, 1957), although in America Saphra and Wassermann (1954) reported on a series of 329 patients infected with this organism, in which there were 144 instances of septicaemia with a positive blood culture and 53 cases of gastro-enteritis. The American variant of *Salm. cholerae suis*, which may be presumed to have infected the majority of Saphra and Wassermann's cases, is known to be much more invasive than the European or *kunzendorf* variant, and differs from it in a number of biochemical and antigenic particulars.

The two cases reported here, of infection with *Salm. cholerae suis* var. *kunzendorf* and *Salm. typhimurium* are presented because they demonstrate the circumstances under which may occur systemic infection by organisms which have poor invasive powers, and also for the intrinsic interest of the clinical findings.

CASE 1

A woman of 60 with diabetes of five years' duration was admitted in a debilitated state but with no abnormal physical signs. Her blood glucose level was 280 mg. per 100 ml., her temperature was 100.2° F. (37.9° C.), and she had severe ketosis. The diabetic condition was easily dealt with, but the fever remained. A leucocytosis of 12,000 cells per c.mm. (72% neutrophils) and an E.S.R. of 117 mm./hr. (Westergren) was found. A radiograph of the chest showed a diffuse fine nodular mottling in both lungs, and a diagnosis of miliary tuberculosis was considered. She was accordingly treated with streptomycin and P.A.S.