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a case report:

## Hemolytic Anemia of Splenic Origin

Hal Minnick  
Dennis Hoeft

### CASE REPORT

A seven year old male Black Labrador was presented to the ISU Veterinary Clinic on June 30, 1966. The past history was anorexia, vomiting, and general weakness.

Physical examination revealed a temperature of 102.0°F, mild icterus, and pain over both kidneys. A urine sample was taken for a spirochete examination and bacteriological culture. Blood work was done and the results are in Table 1. Urinalysis results are in Table 2. The fecal examination was negative for parasite eggs. The fluorescent leptospirosis test and urine culture were both negative.

A tentative diagnosis of leptospirosis in the recovery phase was made. The dog was sent home with a vitamin supplement.

The dog was treated on July 20 by the local veterinarian. The dog exhibited a high temperature, anorexia, and listlessness. The dog was given a whole blood transfusion and started on chloromycetin antibiotic treatment.

The dog was returned to the ISU Veterinary Clinic on August 8, 1966, due to a relapse of the previous condition. The temperature was 103°F, and marked icterus was present. Abdominal palpation revealed splenomegaly. The patient was hospitalized at this time. On August 9th, more blood work was done and the results are in Table 1. The urinalysis results of

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TABLE 1—HEMOGRAM

Date	6-30-66	8-9-66
Hemoglobin (gm%)	4.94	3.77
Hematocrit (PCV%)	20	17
RBC (mill/cm)	1,900,000	—
WBC (thous./cm)	12,300	18,900
Eosinophils	—	700 (3%)
Band neutrophils	—	900 (6%)
Seg. neutrophils	—	15200 (79%)
Monocytes	—	800 (4%)
Lymphocytes	—	1300 (8%)
BUN (mg%)	40	50
Sed. rate in 1 hour	—	4 mm.
Clotting time	—	fast
Blood parasites	—	negative
Van den Bergh		
direct	negative	negative
indirect	negative	positive
SGPT (units)	16	34

August 9th are in Table 2. A bone marrow biopsy was taken revealing excess hematopoiesis.

Treatment was initiated with 500 mg. tetracycline and one Livitamin (Messengill) b.i.d. The animal's condition remained the same. Radiographs were taken on August 15th confirming splenomegaly. An exploratory celiotomy was

TABLE 2—URINALYSIS RESULTS

Date	6-30-66	8-9-66
Color	coffee brown	coffee brown
Specific gravity	1.056	1.041
Reaction (pH)	6	6
Appearance	clean	clean
Albumin	trace	trace
Sugar	negative	negative
Urobilinogen	negative	negative
Blood	negative	negative
Icto-test	positive	positive
Sediment	few epithelial cells	many bile stained pigments or crystals
	few WBC	

TABLE 3—HEMOGRAM

Date	Before surgery		After surgery		
	8-12-66	8-16-66	8-17-66	8-24-66	8-27-66
Hemoglobin (gm%)	4.06	3.48	7.83	7.16	7.83
Hematocrit (PCV%)	16	15	32	35	33

performed on August 16. Blood work was performed before surgery (results in Table 3).

### SURGICAL PROCEDURE

One grain of morphine and 1/150th grain of atropine was given as preanesthetic. Gas anesthesia, Metofane (Pitman-Moore), was used. A midline incision was made from the xyphoid cartilage to the umbilicus. All the major vessels to the spleen were ligated with O catgut. The enlarged spleen was removed (Fig. 1), and the peritoneum was closed with 00 catgut using a continuous mattress suture. The skin incision was closed with Vetafil using simple interrupted sutures. The dog's recovery from anesthesia was smooth and uneventful.

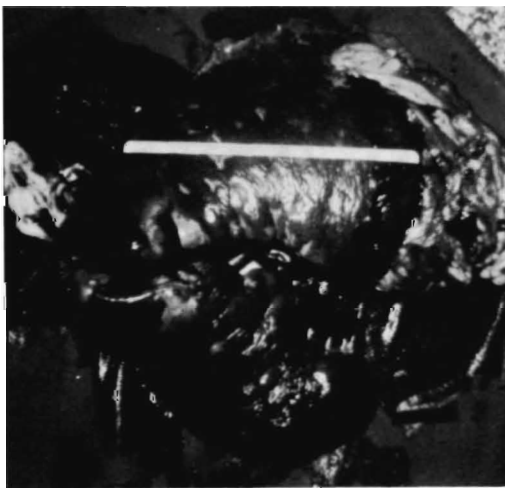


Figure 1—Splenomegaly—the most common pathological finding in autoimmune hemolytic anemic.

The post-operative treatment was 750 ml. whole blood immediately after surgery. Penicillin dihydrostreptomycin and Livitamin with iron (Massengill) b.i.d. were administered several days post-operatively.

The dog's condition improved rapidly after the splenectomy was performed. This improvement in the dog's condition was dynamic. The icterus was subsiding and anemia was not reoccurring. The hemograms performed after surgery (Table 3) indicate the cause of the anemia was being controlled or eliminated. The dog was dismissed on August 31, 1966. Livitamin tablets with iron (Massengill) were sent home with the dog.

### PATHOLOGY REPORT

A biopsy of the spleen was taken, and the results are as follows: extramedullary hematopoiesis with numerous hematocysts in various stages of organization.

### DISCUSSION

A definitive diagnosis of hemolytic anemia (splenic origin) was made. Autoimmune hemolytic anemia is a possibility in this instance. The etiology of autoimmune hemolytic anemia is unknown. This is an acquired hemolytic disease in which the life span of the erythrocyte is greatly shortened. Theoretically, the erythrocytes are coated with globulin as demonstrated by the Coomb's test (Kirk, 1966). This test can be used in diagnosing splenic anemia; it was not performed in this case. Hemolysis then occurs at an increased rate as indicated by changes in pigment metabolism, bone marrow activity, and morphology of the peripheral blood picture. The positive indirect Van den Bergh indicates that this is a hemolytic icterus and not an obstructive icterus (Benjamin, 1961).

Icterus is not a constant finding because of the kidney's low threshold for bilirubin thus allowing its excretion into the urine.

Treatment of this condition is: (1) inhibition of antigen-antibody reaction via the use of corticosteroids or adrenocorticotropic hormones; (2) removal of a portion of the reticuloendothelial system (the spleen); (3) and providing normal erythrocytes by transfusion. Antibiotics

must also be used whenever corticosteroids are used to prevent infections, since antibody production is impaired. Pneumonia is the most common complication (Kirk, 1966). Blood transfusions are contraindicated unless corticosteroids are used and/or splenectomy is performed. Rapidly increasing icterus, collapse, and death have occurred within 18 hours after transfusion of compatible whole blood (Kirk, 1966).

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