Gaucher's Disease in a Black Adult

Stanley B. Novy,[1] Ethan Natelson,[2]
Lawrence Stuart,[3] and Leslie Whitlock[4]

Gaucher's disease, first described in 1882, is a rare familial constitutional disorder in which glucocerebroside accumulates within reticuloendothelial cells of the spleen, liver, and bone marrow. The biochemical defect in affected patients is variable decrease of a hydrolase (glucocerebrosidase) that normally is present in many tissues. In the infantile form of the illness, tissue glucocerebrosidase activity is less than 2% of normal and death rapidly ensues. The adult form of Gaucher's disease is associated with enzyme activity often above 10% of normal. Here the predominant clinical problems involve hypersplenism and destructive bone disease [1–5].

The disorder is inherited in an autosomal recessive pattern with equal gender incidence among affected homozygotes. While the juvenile form of Gaucher's disease shows no racial predeliction, the adult form occurs most commonly in Jewish families of Ashkenazic (Eastern European) extraction. An estimate of its frequency in Israel is 1:12,000 persons [6]. Sporadic reports of adult Gaucher's disease among many other ethnic groups are available but true incidence figures are uncertain [7]. Several authors cite affected black patients, suggesting that the disease may not be rare in this population [7–9].

Case Report

A 37-year-old asymptomatic black woman entered St. Joseph's Hospital for definitive evaluation of a class III Pap smear. Her medical history was unremarkable. There was no familial history of consanguinity or of hematogic disorders, and her children, ages 18, 13, and 9 years, were in good health. On physical examination, she was a healthy appearing woman. Vital signs showed temperature, 37° C; pulse, 82 beats/min; respirations, 13/min; and blood pressure, 130/80 mm Hg. Her spleen extended 8 cm below the left costal margin and there was moderate hepatomegaly. Pelvic examination was normal.

Hemoglobin concentration was 10.3 g/dl; hematocrit value, 30%; white blood cell count, 3,500/mm^3 (3.5 × 10^9/L); and platelet count, 50,000/mm^3 (50 × 10^9/L). Differential blood cell count showed 68% neutrophils, 26% lymphocytes, 4% monocytes, 1% eosinophils, and 1% basophils. Reticulocyte count (uncorrected) was 2.6%. Routine studies on serum were normal, with the exception of the acid phosphatase, which was 6.7 U/ml (normal values, 1.0–4 U/ml). Hemoglobin electrophoresis was normal. Bone marrow examination revealed erythroid hyperplasia and numerous Gaucher cells (fig. 1A). Liver biopsy showed distended vascular sinusoids containing numerous Gaucher cells (fig. 1B).

Beta glucosidase activity of the patient leukocytes was 1.6 nmol/hr/mg protein (control value, 3.7 nmol/hr/mg protein). Similar studies on her cultured skin fibroblasts showed a value of 15.5 nmol/hr/mg protein (control value, 53 mol/hr/mg protein).

Radiographic findings included numerous gallbladder calculi in the right upper quadrant. There was downward medial displacement of the left kidney by an enlarged spleen. There was some prominence of the bony trabeculae suggestive of a hemolytic process (fig. 2A). Radiography of the femurs demonstrated cortical thickening bilaterally (fig. 2B). Films of the right shoulder showed a patchy "moth-eaten" appearance of the humerus with sclerotic and osteolytic areas (fig. 2C).

Following the diagnosis of Gaucher's disease, the patient underwent splenectomy. Her blood cell count returned to normal. She continues to do well, with the exception of a painful right shoulder. She ultimately underwent hysterectomy for the abnormal uterine cytology.

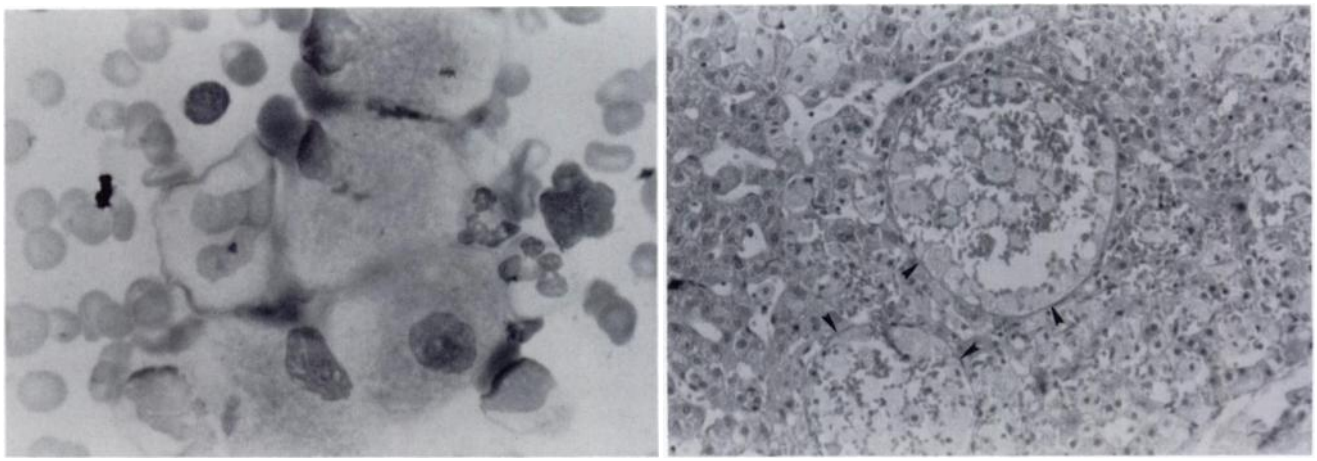
Discussion

Adult Gaucher's disease is generally first detected during investigation of unexplained splenomegaly. Symptoms usually arise during the first decade from the enlarged spleen and bone marrow infiltration. Anemia, leukopenia, and thrombocytopenia are found in varying combinations and may be relieved by splenectomy. Skin pigmentation and conjunctiva may occur.

The characteristic cells are seen primarily in the lymphoreticular tissue of liver, spleen, and bone marrow. The classic morphologic findings, which are appreciated best in Romanovsky-stained material, consist of a large cell 20–100 mm in diameter having a nondescript nucleus, but a voluminous cytoplasm containing striations reminiscent of "crumpled tissue paper." These "foam cells," which include Gaucher cells, are not diagnostic, since they are seen

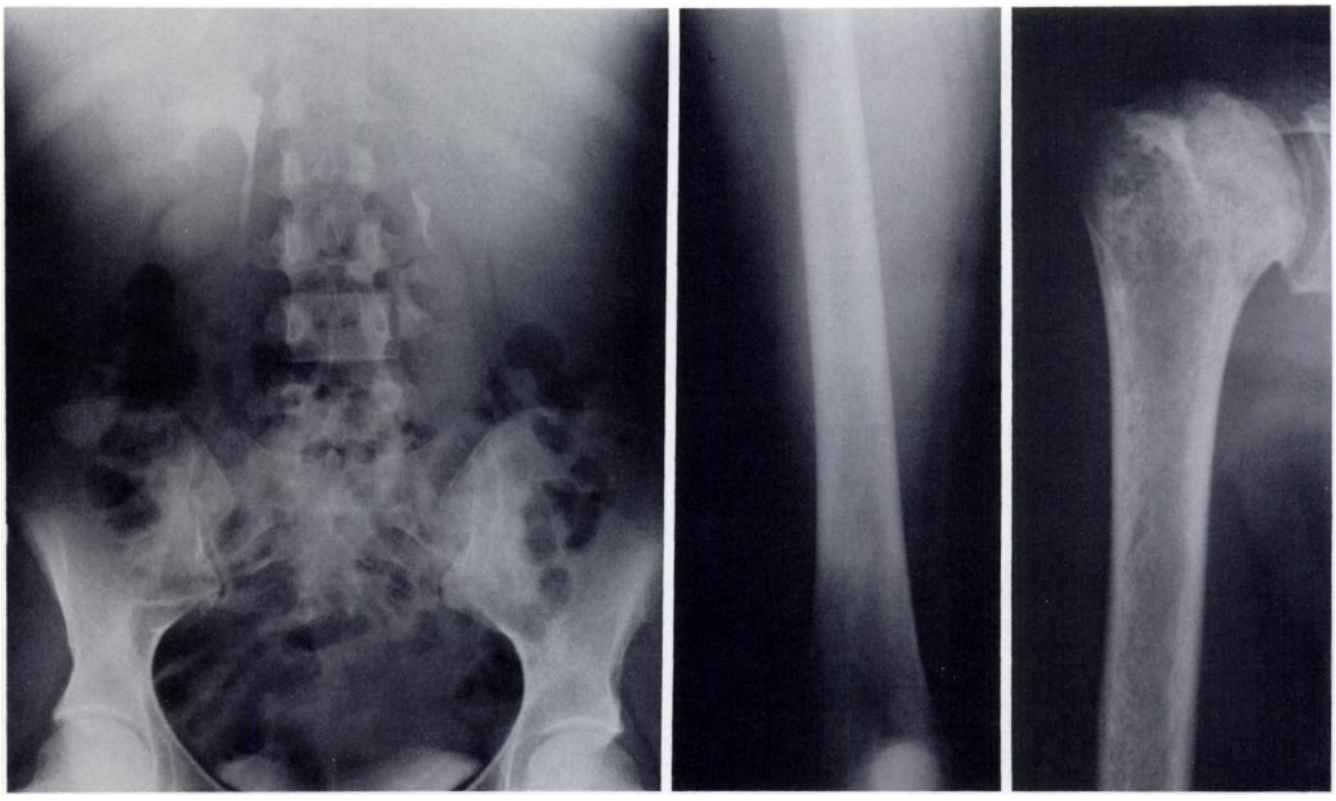
Received January 25, 1979; accepted after revision March 13, 1979.
[1] Department of Radiology, St. Joseph's Hospital, Houston, TX 77002. Address reprint requests to S. B. Novy.
[2] Department of Medicine, St. Joseph's Hospital, Houston, TX 77002.
[3] Department of Pathology, St. Joseph's Hospital, Houston, TX 77002.
[4] Department of Obstetrics and Gynecology, St. Joseph's Hospital, Houston, TX 77002.

 0361-803X/79/1335-0947 $00.00



A B

Fig. 1.—**A,** Touch preparation from splenic tissue demonstrates Gaucher cells. **B,** Liver biopsy. Distended vascular sinusoids (*arrows*) contain numerous Gaucher cells.



A B C

Fig. 2.—**A,** Gallstones, spenomegaly, prominent trabecula of lumbar spine. Excretory urogram demonstrates downward medical displacement of left kidney by enlarged spleen. **B,** Bilateral cortical thickening of femoral shaft. **C,** Patchy destruction of head of humerus in "moth-eaten" pattern (courtesy of L. E. Richey, M.D.).

in many other conditions [4]. More exact diagnosis is obtained by enzymatic analysis of leukocytes and cultured skin fibroblasts which may confirm a decreased glucosidase activity.

The most frequent sites of skeletal involvement are the femurs, spine, hips, shoulders, tubular bones, and pelvis. The lower extremities are more often involved than the upper. The skull, ribs, sternum, scapulas, and mandible are less often involved. The basic process is similar to that in other diseases where bone marrow shows proliferation or infiltration with abnormal cells. There may be loss of bone density, simulating osteoporosis, especially in the spine.

Bone trabeculae are resorbed and the remaining trabecular stand out in relief, giving an altered or coarsened pattern, as in the lumbar spine of our patient. Pathologic destruction may occur in a geographic or "moth-eaten" manner giving a picture very similar to osteolytic metastases. This pattern was seen in the right shoulder of our patient. Ischemic necrosis, particularly of the femoral heads, is one of the most common findings [10, 11].

In long bones, the cortex may be involved with destruction, scalloping, new bone formation, and cortical thickening. In figure 2B, the cortex of both femurs are thickened. The distal femur may show changes of "Erlenmeyer flask" deformity due to the expansion of the femur [10, 11].

Radiographic findings in Gaucher's disease may occur in other disease entities. However, the combination of radiographic findings, clinical findings, and pathologic findings lead to the diagnosis of Gaucher's disease.

REFERENCES

1. Brady RO: Genetics and the sphingolipdoses. *Med Clin North Am* 53:827–837, 1969
2. Gordon EJ: Gaucher's disease in adults. *South Med J* 69:664–669, 1976
3. Thorn GW: *Harrison's Principles of Internal Medicine*, 8th ed. New York, McGraw-Hill, 1977, pp 676–677
4. Williams WJ, Beutler E, Ereslev AJ, Rundles RW: *Hematology*. New York, McGraw-Hill, 1977, pp 1148–1151
5. Wintrobe MM, Lee GR, Bogg DR, Bithell TC, Athens JW, Foerster J: *Clinical Hematology*. Philadelphia, Lea & Febiger, 1974, pp 1332–1336
6. Groen JJ: Present status of knowledge of Gaucher's disease. *Isr J Med Sci* 1:507, 1965
7. Chang-Lo M, Yam LT, Rubenstone AI: Gaucher's disease: review of the literature and report of twelve new cases. *Am J Med Sci* 254:303–315, 1967
8. Miller J, McCluer R, Kaufer JN: Gaucher's disease: neurologic disorder in adult siblings. *Ann Intern Med* 78:883–887, 1973
9. Schneider EL, Epstein CJ, Kaback MJ, Brandes D: Severe pulmonary involvement in Gaucher's disease: report of three cases and review of the literature. *Am J Med* 63:475–480, 1977
10. Greenfield GB: Miscellaneous diseases related to the hematologic system. *Semin Roentgenol* 4:244–246, 1974
11. Greenfield GB: *Radiology of Bone Diseases*. Philadelphia, Lippincott, 1976