Bone Marrow Involvement by Nephrogenic Systemic Fibrosis (Nephrogenic Fibrosing Dermopathy)

William Payne, M.D., Dollett White, M.D., Nghia Nguyen, M.D.
Department of Pathology and Laboratory Medicine, University of Texas-Houston Medical School

Context

Nephrogenic Systemic Fibrosis, also known as nephrogenic fibrosing dermopathy, is a recently recognized rare disease usually occurring in patients with renal insufficiency who were exposed to gadolinium containing contrast agents, and until recently, considered limited to the skin. The characteristic cutaneous findings include symmetrical skin thickenings on the extremities with accumulation of collage and fibrous tissue, and often positivity for CD34, CD68, and Factor XIIIa. Although there have been recent reports of systemic involvement, bone marrow findings have not been reported to our knowledge.

Design / Methods

A bone marrow biopsy with aspiration was performed on a 70 year-old male patient with nephrogenic fibrosing dermopathy (diagnosed in 2004), status post 6 months of photopheresis, and 15 months of plasmapheresis. Reticulin, trichrome, and immunoperoxidase stains for CD34, CD68, and Factor XIIIa were performed. Peripheral blood was sent for immunophenotyping by flow cytometery.

Results

The peripheral blood showed pancytopenia, but otherwise had no significant abnormalities, with unremarkable flow cytometry panel results. The bone marrow biopsy revealed rare dysplastic erythroid forms. Diffuse bone marrow reticulin fibrosis was present (Figure 3), with the CD34 immunostain showing rare (<2% of nucleated cells) positivity (Figure 4). CD68 showed scattered nonspecific positivity (Figure 5). Both Factor XIIIa immunostain and trichrome stain were negative(not shown).

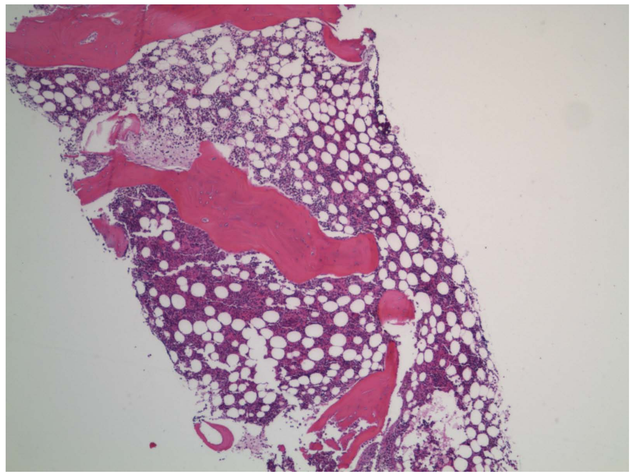

Figure 1. Normocellular bone marrow for age, with features of renal osteodystrophy (10X)

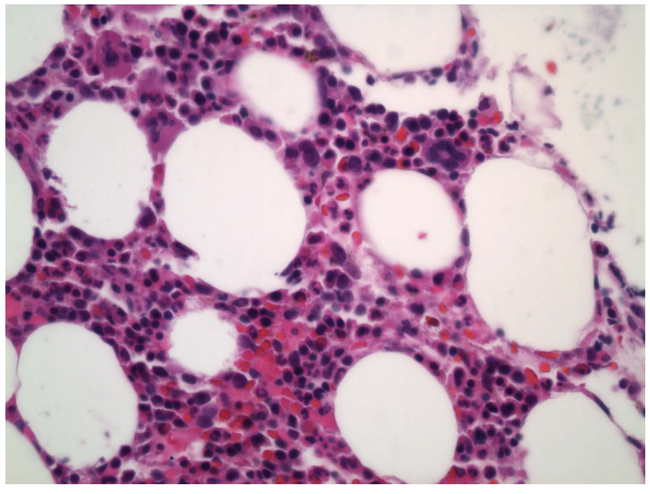

Figure 2. Unremarkable trilineage hematopoiesis (40X)

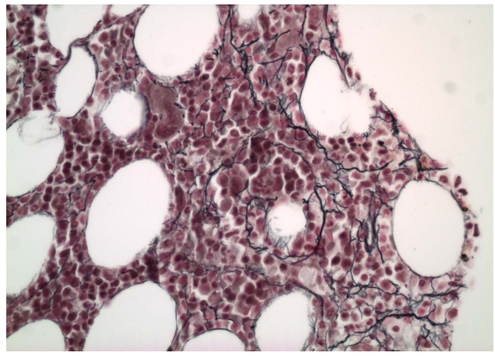

Figure 3. Marked reticulin fibrosis (20X)

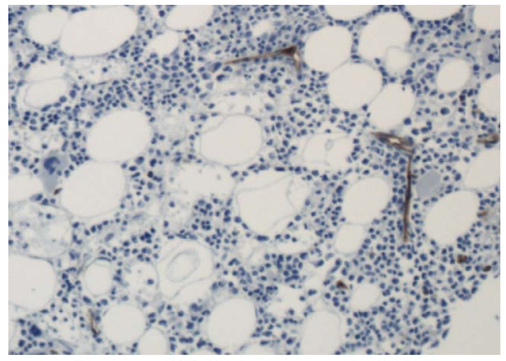

Figure 4. CD 34 immunostain(20X)

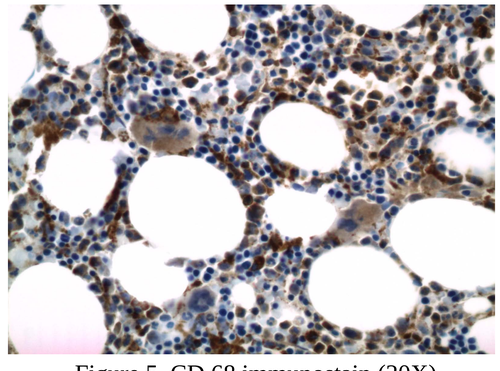

Figure 5. CD 68 immunostain (20X)

Conclusion

Diffuse reticulin fibrosis was found in the bone marrow of this patient with nephrogenic systemic fibrosis, with an associated peripheral blood pancytopenia. Other etiologies for bone marrow reticulin fibrosis (such as myeloproliferative disorders, hairy cell leukemia, and human immunodeficiency virus) were excluded. The immunostaining pattern was not completely consistent with some reported cases of nephrogenic systemic fibrosis. This lack of immunostain similarity could either be due to site specific variations in disease presentation, or due to his extended disease course and therapy.

The possibility of bone marrow involvement by nephrogenic systemic fibrosis leading to pancytopenia holds important diagnostic and treatment implications.

References

1. Cowper, SE, et al. “Nephrogenic Fibrosing Dermopathy”. The American Journal of Dermatopathology. 2001; 23(5): 383-393.
2. Galan, A, et al. “Nephrogenic Systemic Fibrosis (Nephrogenic Fibrosing Dermopathy)”. Current Opinion in Rheumatology. 2006; 18:614-617.
3. Jimenez, SA. “Dialysis-Associated Systemic Fibrosis (Nephrogenic Fibrosing Dermopathy)”. Arthritis & Rheumatism. 2004; 50(8): 2660-2666.