A Case of Cryocrystalglobulinemia

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Reprint will not be available from the author.
We should like to mention here that we have read the AABB's policy on Conflict of Interest and none of us have any Conflicts of Interest or financial interests related to the manuscript.

Running head: A case of cryocrystalglobulinemia

A 52-year-old male with ~~a history of~~ chronic obstructive pulmonary disease was repeatedly hospitalized with respiratory and renal failure at an outside institution. He developed deep venous thrombosis, basal ganglia hemorrhage, and sepsis; he was found to have~~, and was eventually diagnosed with~~ an IgG kappa monoclonal gammopathy ~~of undetermined clinical significance~~ (serum protein electrophoresis: 0.1 g/dL M-protein).

Seven months later, he presented at our institution with a diffuse purpuric rash covering his entire body (figure 1), renal failure and mild thrombocytopenia. Antibody screen/DAT and hemolysis labs were negative, ~~and~~ ADAMTS13 activity was 53% and bone marrow biopsy was unremarkable. A skin biopsy showed neutrophilic thrombotic vasculopathy with crystals ~~(figure 2)~~; a kidney biopsy showed cortical necrosis, fibrocellular crescents, arterial thrombi and extensive tubular injury with occasional tubular and glomerular crystals (figure 2). C~~His c~~ryocrit was 12% and he was diagnosed with type I cryocrystalglobulinemia. Cryocrystalglobulinemia is a rare type of cryoglobulinemia that results in microvascular lesions due to the crystallization of monoclonal immunoglobulins often causing more severe manifestations than other cryoglobulinemias. Therapeutic plasma exchange (TPE) treatment is a category I application for cryoglobulinemia by~~in~~ the apheresis recommendations from the American Society for Apheresis.

After steroid/cyclophosphamide/bortezomib therapy and eight ~~plasmapheresis~~ TPE ~~treatments~~procedures (one plasma volume exchange replacing ~~with replacement~~ with albumin) over one month, the cryoglobulin became undetectable and renal function improved. However, he developed gastrointestinal bleeding from the cryoglobulinemic vasculopathy and relapsed with a cryocrit of 42%, renal/respiratory dysfunction, and mental status change. The cryoprecipitate extracted from his blood sample for cryocrit ~~His cryoprecipitate~~ showed spindled crystals (figure 3). After medication therapy, dialysis and eleven further TPE ~~plasmapheresis~~over

one month, his cryocrit decreased to 5% with improvement of mental status but not organ function. He eventually withdrew all treatment and expired twelve months after his initial diagnosis.

~~Cryocrystalglobulinemia is a rare type of cryoglobulinemia that results in microvascular lesions due to the crystallization of monoclonal immunoglobulins often causing severer manifestations than other cryoglobulinemias.~~ In our case, ~~plasmapheresis~~ TPE improved symptoms and lowered cryocrit by removing cryocrystalglobulins temporarily; however, it did not change the disease process.

Reference

Gupta V, El Ters M, Kashani K, Leung N, Nasr SH. Crystalglobulin-induced nephropathy. J Am Soc Nephrol. 2015 Mar;26(3):525-9.

~~References~~

~~Gupta V, El Ters M, Kashani K, Leung N, Nasr SH. Crystalglobulin-induced nephropathy. J Am Soc Nephrol. 2015 Mar;26(3):525-9.~~

~~Tsuji T, Itoh Y, Nakamura T, Toyozumi Y, Arima N, Tsuda H. Crystalglobulinemia syndrome due to monoclonal gammopathy of renal significance. QJM. 2015 May;108(5):417-8.~~

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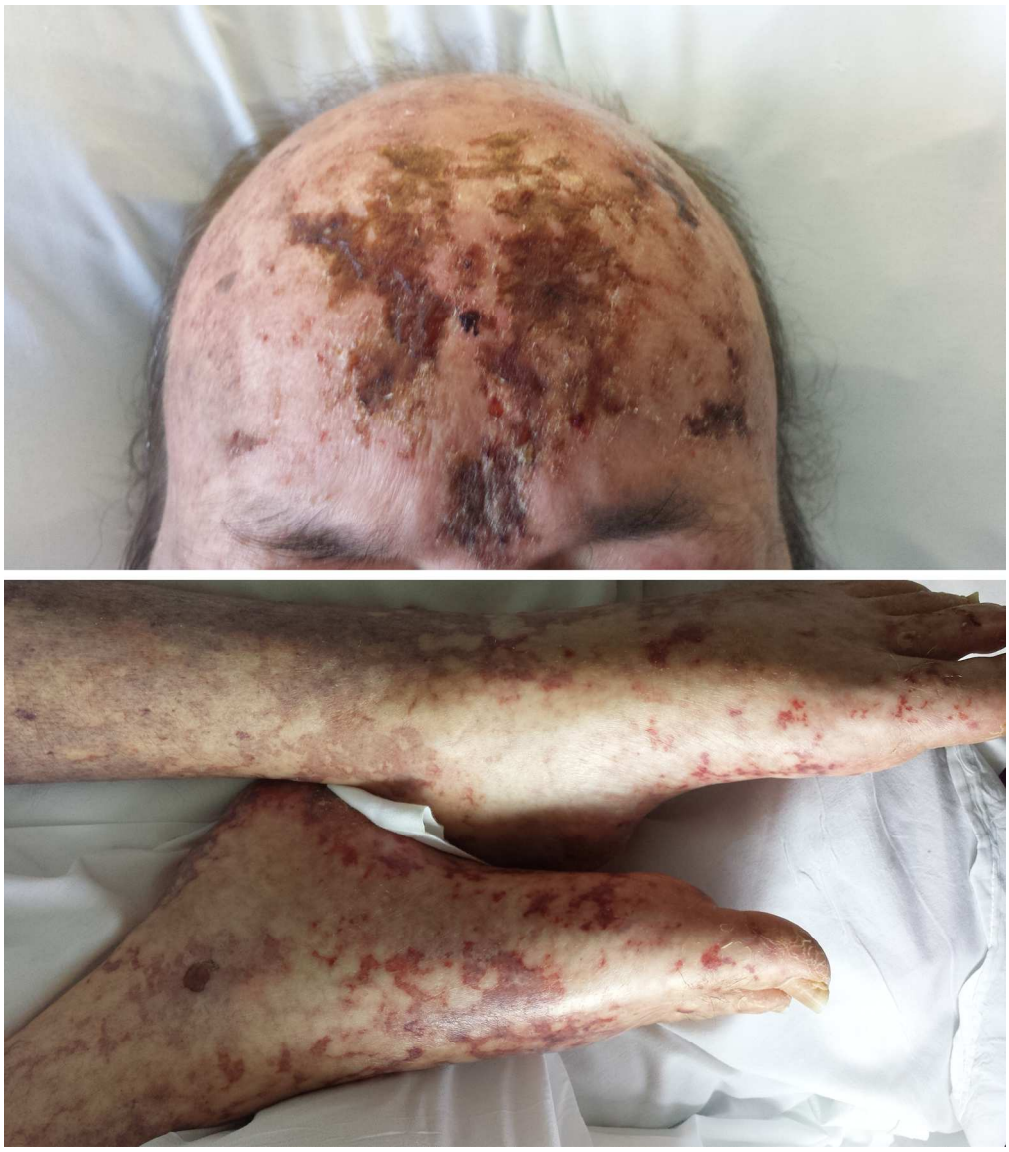

Figure 1. Purpuric rash on forehead and feet.
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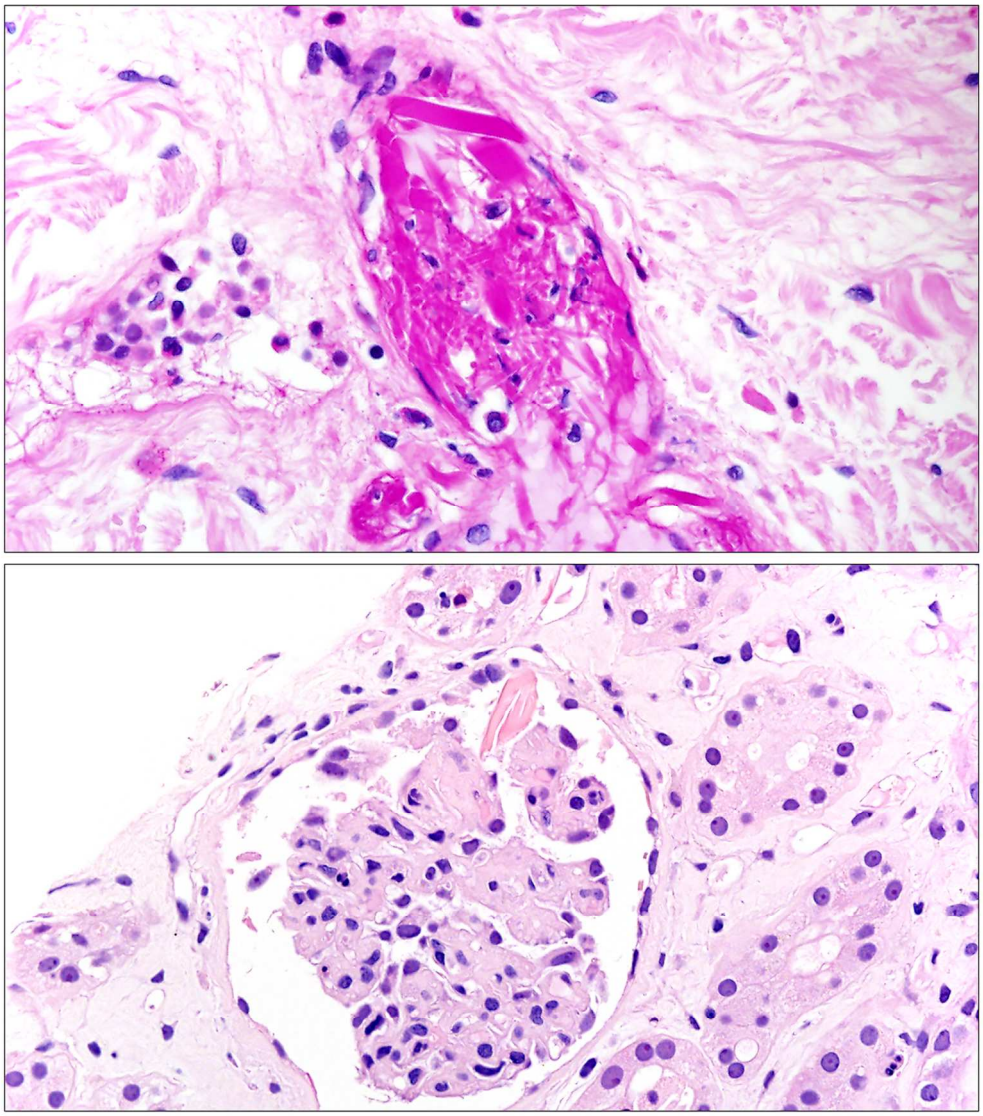

Figure 2. Intravascular crystals in skin biopsy (top, PAS staining) and glomerular crystals in kidney biopsy (bottom, H&E staining).
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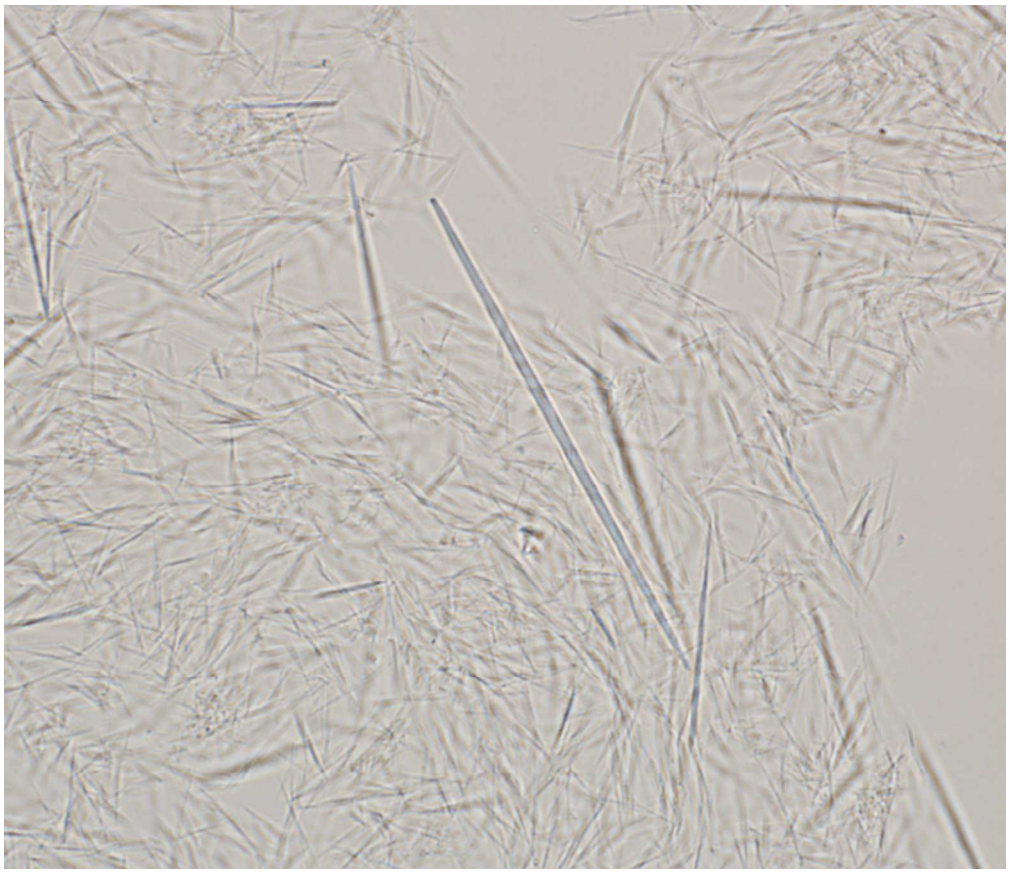

Figure 3. Crystals in cryoprecipitate extracted from the patient blood.
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