

Renal Dysfunction due to Mitral Valve Repair-Induced Hemosiderosis with Partial Recovery after Corrective Surgery

Nicole Fernandez MD¹, Gilad Guez MD¹, Abdelaziz Elsanjak MD¹, and Christine Vanbeek MD²

1. LewisGale Medical Center, Salem, VA, United States. 2. AmeriPath, Oklahoma City, OK, United States.

Introduction

Renal hemosiderosis (RH) occurs when free hemoglobin is filtered by glomeruli and reabsorbed by proximal tubular cells (PTC). Hemosiderin subsequently accumulates within PTC lysosomes. Various conditions associated with intravascular hemolysis may lead to RH. Mechanical hemolysis is a known complication of severe heart valve disease and heart valve replacement. However, biopsy-proven RH is rarely reported following mitral valve (MV) repair. Here, we describe a case of renal dysfunction due to RH after MV repair with follow-up after corrective surgery.

Case Description

- A 77 year-old male presented with history of severe MV regurgitation and atrial fibrillation.
- He underwent a MV repair that included triangular resection, primary leaflet repair, and Cosgrove posterior annuloplasty ring.
- This resulted in significant improvement in cardiac function.
- Baseline serum Cr was 0.9 mg/dL. 3 months post-procedure. He developed gross hematuria. Urinalysis showed 3+ blood, 1+ protein, and 2-5 RBCs. Macrocytic anemia (Hb 7.6 g/dL, MCV 117 fL) and hemolysis (LDH 2,043 U/L, haptoglobin < 20 mg/dL) were also noted.
- Peripheral smear was negative for schistocytes.
- Platelet count was normal. Serum Cr was elevated at 2.1 mg/dL. Renal biopsy showed abundant golden refractile granules, predominantly within PTC cytoplasm (**Fig. 1A**, H&E x400), which were confirmed to be hemosiderin on the Prussian Blue stain (**Fig. 1B**, Prussian Blue x400). Arteriosclerosis and mild interstitial fibrosis (~20%) were present.
- Glomeruli were normal. Ultrastructural study revealed lysosomes containing variably sized electron dense inclusions within PTC (**Fig. 1C**, EM x9300).

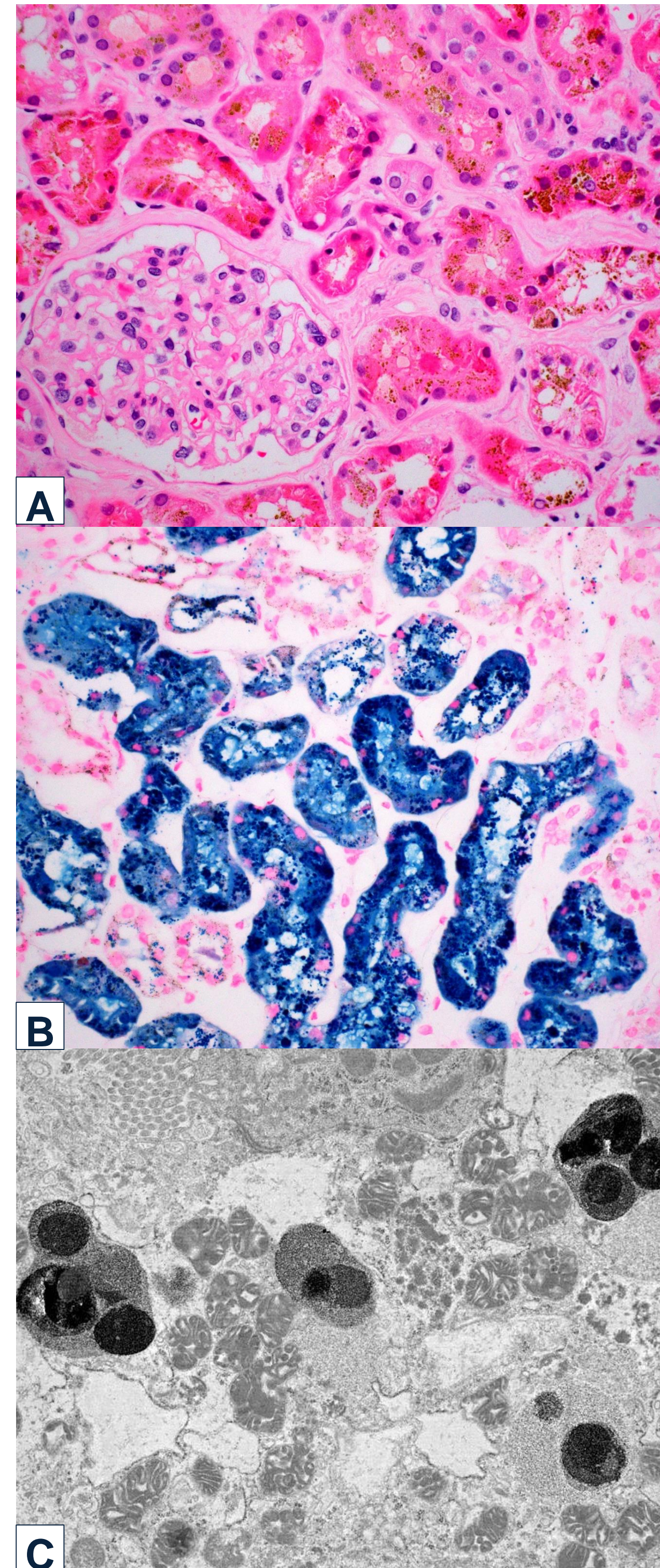


Figure 1. Renal biopsy images

Follow-up

Transesophageal echocardiogram showed new mild MV regurgitation with a posteriorly directed annuloplasty ring and new small ventricular septal defect. He then underwent a corrective surgery. His hemolytic anemia and hemoglobinuria resolved within 2 months. Hb was 13.7 g/dL and serum Cr improved to 1.3 mg/dL.

Discussion

- The few prior case reports of MV repair-induced RH had clinical manifestations ranging from asymptomatic urinary abnormalities to renal dysfunction and did not describe repeat surgery.
- This case demonstrates that corrective surgery can lead to resolution of hemolysis and at least partial recovery of renal dysfunction.

References

Qian Q, Nath KA, Wu Y, Daoud TM, Sethi S. Hemolysis and acute kidney failure. *Am J Kidney Dis.* 2010;56(4):780-784. doi:10.1053/j.ajkd.2010.03.025

Lee IH, Kang GW, Kim CY, Lee SJ, Kim MK, Ahn DJ. Renal hemosiderosis secondary to intravascular hemolysis after mitral valve repair: A case report. *Medicine (Baltimore).* 2020;99(3):e18798. doi:10.1097/MD.00000000000018798