Sevelamer-Associated Appendicitis

Background: This 34 year old woman presented to our institution with a history of acute abdominal pain, nausea, and non-bilious, non-bloody vomiting. She had a history of lupus nephritis for which she was treated with peritoneal dialysis. She was found to have a polymicrobial bacterial peritonitis and positive blood cultures, with negative CT and vaginal ultrasound scans. She was treated with antibiotics and her peritoneal catheter was removed. Her abdominal pain diminished and her white cell count decreased.

She then developed acute right lower quadrant abdominal pain and leukocytosis. Her pain increased and became refractory to narcotics, and a third CT a week later showed intraperitoneal free air and thickening of the descending and ascending colon. Exploratory surgery revealed a gangrenous perforated appendix with diffuse peritonitis and a pelvic floor abscess. Her appendix was removed, and thickening of the ascending and descending colon. Exploratory surgery revealed a gangrenous perforated appendix with diffuse peritonitis and a pelvic floor abscess. Her appendix was removed, and thickening of the ascending and descending colon.

Discussion: Sevelamer is a non-absorbable anion-exchange hydrogel polymer approved by the FDA in 1998 designed to bind phosphate within the GI lumen to an insoluble compound that is passed in the stool. It is composed of ammonia fixed on a carbon backbone and associated with an anion in the solid form (e.g. hydrochloride).

Previous studies have shown that the crystals of sevelamer are morphologically distinct from other ion-exchange resins (e.g. kayexalate, cholestyramine). They can be distinguished histologically by the characteristic “fish scale” cracked appearance with curved intersecting lines. On H&E, they show two-toned coloration with outlines highlighted in pink and the interior of the crystals orange-yellow. Notably, reports have suggested that crystals embedded within areas of mucosal ulceration or ischemia, or within necrotic debris, can show a deep “rusty” brown color (See Figure 2, left).

Kayexalate (sodium polystyrene sulfonate) crystals, by contrast, have a more rectangular shape with perpendicular intersecting lines and show a characteristic violet color.

Cholestyramine crystals lack internal lines, have a solid single-tone color (typically eosinophilic), and a smooth texture. Studies have suggested that cholestyramine crystals lack the ability to cause mucosal injury, though they may be associated with areas of injury in patients taking multiple resins.

Results: The patient eventually recovered after a nearly month-long hospitalization. She was transitioned back to peritoneal dialysis and subsequently discharged. She remains on sevelamer to prevent hyperphosphatemia and has not presented with further sequelae.

Conclusions: Our patient eventually recovered after a nearly month-long hospitalization. She was transitioned back to peritoneal dialysis and subsequently discharged. She remains on sevelamer to prevent hyperphosphatemia and has not presented with further sequelae.