

## CASE REPORT

# Delayed Onset of Ventricular Fibrillation after Bowel Prep for Routine Colonoscopy

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Endoscopy for colon cancer screening, especially colonoscopy, is viewed as routine for adults 50 and older and is associated with a decreased mortality from colorectal cancer.<sup>1,2</sup> Adequate bowel prepping with oral isosmotic laxatives such as polyethylene glycol (PeG)<sup>3</sup> or hyperosmotic laxatives such as sodium phosphate (NaP) is critical in achieving the end-goal of colonoscopy—the detection of colon lesions, particularly polyps.<sup>4</sup> Medical attention is often devoted to the bowel prep, the colonoscopy procedure, and the concurrent anesthetic risks; however, electrolyte imbalances induced by the osmotic diarrhea are frequently unanticipated, even with the use of lower risk purgatives such as PeG. NaP, though more effective in achieving a successful bowel preparation, has demonstrated an increased risk in biochemical complications including electrolyte imbalances (e.g., sodium, phosphate, calcium, uric acid, etc.), renal disturbances and hypovolemia.<sup>5</sup> In high-risk patients, there have been cases of cardiac arrhythmias triggered by bowel prep for colonoscopies; these patients had other comorbidities, including renal insufficiency, concurrent use of diuretics, or advanced age.<sup>6</sup> In this case report, a high-risk cardiac patient without any additional comorbidities underwent a routine, screening colonoscopy and subsequently experienced ventricular fibrillation due to laxative-triggered hypokalemia. What is most unique in this case of a 53-year-old female with known Brugada syndrome was that complications arose two days after her successful and otherwise uneventful colonoscopy.

One year prior to this reported event, the patient had cardiac arrest while resting at home with her family. The patient had no significant past medical history prior to this, and all previous hospitalizations were related to normal labor and delivery. The patient's family was present at the moment of her cardiac arrest and her husband successfully provided immediate cardiopulmonary resuscitation until paramedics arrived. Ventricular fibrillation was noted by the EMT, and the patient was successfully cardioverted with a portable defibrillator while in transport to the emergency department. She recovered without sequelae. After a detailed workup and after implantation of an automatic cardioverter defibrillator (AICD), the patient tested positive for the SCN5A mutation, typical for Brugada syndrome; this genetic condition is characterized by a structurally normal heart but with an increased risk of ventricular arrhythmias and sudden death. Described as autosomal dominant with variable phenotype, Brugada syndrome may involve defects of the sodium ion channels. Unlike other identified causes of sudden death, this condition is typically not associated with exercise and has a greater incidence of events at night. Known triggers for Brugada-type arrhythmias include fever, hypokalemia, hyperkalemia,

hypercalcemia, vagal maneuvers, Class IA and IC anti-arrhythmics, tricyclic and tetracyclic antidepressants, lithium, alcohol, and cocaine.

After her diagnosis, the patient remained active and maintained a healthy lifestyle. She voluntarily abstained from driving since her diagnosis, relying on family and car-ride services, and from consuming any alcohol or drugs of abuse. Her only medication was low-dose metoprolol for rate control and for anxiety. She had no history of hypertension, diabetes, renal impairment, or coronary heart disease. A coronary angiogram, completed as part of her arrhythmia work up, had been normal. Married with children, she was up-to-date with her routine vaccinations and had routine laboratories and exams through her primary care physicians. As part of her routine healthcare maintenance, she completed an outpatient bowel preparation using PeG and had a normal outpatient colonoscopy without incident. Her only medication upon discharge to home was metoprolol, which she resumed immediately after returning home. She later denied fevers, chills, gastrointestinal distress, or malaise after her procedure. The patient did note "feeling dehydrated" with persistent dry mouth and thirst during the first 24 hours. On day two after the procedure, she lost consciousness while at home and experienced spontaneous discharge of her implanted defibrillator. Her family noted immediate recovery and return to consciousness. She denied any unusual exertion or triggers prior to the event. She was taken to a local emergency room by paramedics and was awake and conversant on arrival. Immediate laboratories were normal except for most notably hypokalemia with a potassium of 2.6 mEq/L. She was given intravenous potassium chloride as well as magnesium and remained in the hospital for 48 hours of monitored observation. Interrogation of her defibrillator confirmed an episode of spontaneous ventricular fibrillation. No other electrocardiogram abnormalities were noted throughout the duration of her stay, and she has remained asymptomatic since that admission with no further discharge of her AICD.

Review of the literature confirms similar incidents though only in the presence of significant comorbid issues. In general, bowel preparation for colonoscopy has been associated with electrolyte disturbances and the type of preparation used may be associated with greater risks than others. Oral sodium phosphate has been associated with more significant disturbances in electrolyte and renal function than the more commonly used oral polyethylene glycol solutions.<sup>7</sup> However, oral polyethylene glycol preparations have been associated with hypokalemia that can be significant with levels of potassium less than 3.0 mEq/L occurring 48 hours after administration.<sup>8</sup> This prolonged duration of electrolyte imbalances would have

an impact far beyond the initial post-procedure observation period and could potentially place high-risk patients alone and without appropriate attendant care. In this example, the patient was in the presence of her family, who were familiar with both her medical history and educated on the appropriate response.

Fortunately for this patient, she had not yet resumed driving after her initial diagnosis. She received medical care quickly and promptly, and, because her colonoscopy was normal, she will not require a gastrointestinal follow-up for another ten years. It has been discussed with this particular patient that future procedures requiring bowel prep should be performed with close electrolyte monitoring during the bowel cleanse itself and such monitoring should continue for up to 2-3 days post-procedure. This case highlights that some high-risk patients, even without renal impairment or concurrent use of diuretics, may require close electrolyte monitoring and replacement for up to two days after bowel preparation for colonoscopy.

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