Pulmonary Edema and Cardiac Arrest Complicating Transurethral Resection of the Prostate and TURP Syndrome

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Abstract

INTRODUCTION: Transurethral resection of the prostate (TURP) syndrome is defined by fluid overload during bladder irrigation, leading to hyponatremia and hypervolemia, and is a known complication of TURP. Over 400,000 TURP procedures occur each year with TURP syndrome occurring in 10-15% of cases, and an associated mortality of 0.2 to 0.8%. The presentation can vary from minimal symptoms to complete cardiovascular collapse, multi-organ failure, and death. Because of the variable presentation, TURP syndrome may not be recognized in a timely fashion. Knowledge of this syndrome including pathophysiology and treatment is essential to ensure early recognition and treatment.

CASE PRESENTATION: A generally healthy and active 81 year old male underwent elective transurethral resection of the prostate to treat persistent hematuria in the setting of benign prostatic hypertrophy. Spinal anesthesia was achieved with bupivacaine. As an irrigant solution, approximately 13 liters of 1.5% glycine was instilled. Approximately 30 minutes into the procedure the patient developed mental status changes and became restless. The procedure was stopped and shortly thereafter he suffered a cardiac arrest with findings of pulseless electrical activity. An electrolyte panel drawn at that time demonstrated serum sodium of 114 mEq/L, down from the pre-operative value of 145 mEq/L. Adequate circulation was restored after a brief resuscitation and he was transferred to our facility by helicopter. Laboratory studies were notable for a serum sodium of 115 mEq/L, ammonia 245 mcg N/dL, and chloride 82 mEq/L. ABG 7.29/pCO2 55 mm Hg/pO2 90 mmHg. The lactate and serum bicarbonate were normal. Examination was notable for edema and dramatic fluctuations in blood pressure ranging from pulseless arrest to severe (but transient) hypertension (SBP 220-300 mm/Hg) after resuscitation with CPR and epinephrine. Chest radiograph showed bilateral diffuse alveolar infiltrates. He was emergently treated with hypertonic 3% sodium chloride and furosemide with a resultant correction of sodium to 125 mEq/L (and further corrected to 135 mEq/L over the next 12 hours). While still requiring some vasopressor support, his overall clinical status stabilized within hours after the correction of his sodium and he was extubated within 24 hours without apparent neurologic sequelae.

DISCUSSION: Large amounts of irrigation are essential to the TURP procedure; desirable irrigation is electrolyte free and optically neutral. Irrigation fluids in use today include sterile distilled water, glycine, mannitol, and glucose. During the procedure prostatic venous sinuses are exposed and irrigation fluid under elevated pressure can reach the vascular circulation, sometimes in massive amounts approaching 200 ml/minute. The complications associated with such absorption are protean and include marked volume shifts, edema, circulatory overload, severe electrolyte disturbances (hyponatremia), cerebral edema, and cardiovascular collapse. Improvements in the procedure have decreased the incidence of TURP syndrome; however it is not entirely avoidable with current technology.

CONCLUSIONS: TURP, though a common and relatively safe procedure, may have dramatic life threatening complications. A high index of suspicion for TURP syndrome should
be maintained by the intensivist when caring for post-TURP procedure patients to allow anticipation of the serious complications which may arise in the perioperative period.


DISCLOSURE: The following authors have nothing to disclose: Jody Olson, Steve Peters

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