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Coronary Artery Bypass Grafting as a Precipitating Factor in Diabetic Ketoacidosis in Type 2 Diabetes

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Case Presentation: A 56-year-old woman with type 2 diabetes (T2DM) presented with unstable angina. Electrocardiogram showed ST elevation in all leads. On admission, she developed ventricular tachycardia followed by asystole and was resuscitated with transvenous pacing. Angiogram showed triple-vessel disease. Preoperatively the patient was on insulin lispro, 4.5 U/hr, with subcutaneous (SC) doses of sliding-scale insulin every 2 hours. On the day of surgery, her fasting blood glucose was 180 mg/dL with no ketone or abnormal electrolytes. She received 6 U of lispro SC and was premedicated 1 hour before surgery and was preoxygenated. Anesthesia was induced with thiopentone, morphine, isoflurane, and vecuronium.

Postinduction blood glucose was increased to 463 mg/dL with HCO₃ of 15.1, pH 7.25, and urine ketone of 3+. The patient received intravenous (IV) dose of 10 U of lispro and 25 mL of 7.5% HCO₃. The following Table depicts the patient's treatment during surgery and postoperatively with responses to therapy. She also received 100 mL (20%) of mannitol as a prophylaxis for possible hypercoagulation state.

TABLE

| Time | Procedure | Serum values for: | | | | | | Insulin received | |
|-------|-----------|-------------------|------------------|-----------------|------------------|------|-----|------------------|----------|
| | | Glucose | HCO ₃ | PO ₂ | PCO ₂ | pH | K+ | Infusion/hr | IV bolus |
| 11:24 | Induction | 463 | 15.1 | 148 | 33 | 7.25 | 4.2 | 10 U | 10 U |
| 11:55 | Operation | 398 | 17.1 | 155 | 39 | 7.53 | 3.9 | 10 U | 10 U |
| 12:32 | Operation | 395 | 18.1 | 181 | 40 | 7.28 | 3.7 | 10 U | 10 U |
| 13:09 | Operation | 304 | 21.3 | 178 | 38 | 7.35 | 3.7 | 10 U | 10 U |
| 13:38 | Operation | 315 | 21.6 | 181 | 35 | 7.35 | 3.7 | 10 U | 10 U |
| 14:32 | Operation | 295 | 24.1 | 148 | 35 | 7.42 | 3.6 | 10 U | 10 U |
| 15:12 | Postop | 194 | 24.4 | 90 | 37 | 7.41 | 3.4 | 10 U | 10 U |

Patient recovered uneventfully. Her insulin requirement postoperatively was 2 U/hr on average blood glucose of 118 to 170 mg/dL with normal electrolytes. Patient was discharged 5 days later.

Conclusion: We conclude that anesthesia induction and coronary artery bypass grafting in this T2DM patient resulted in the emergence of diabetic ketoacidosis (DKA); hydration, low to moderate doses of insulin, and frequent monitoring of the patient resulted in uneventful recovery from DKA.