

Case Study: Diabetic Ketoacidosis with Polytrauma in a 38-Year-Old Woman

Presenting Concerns:

A 38-year-old female with a history of type 2 diabetes mellitus (T2DM) presented to the emergency department (ED) via ambulance in an unconscious state. Emergency Medical Services (EMS) reported multiple episodes of cardiac arrest en route, successfully resuscitated with defibrillation.

Past Medical History:

- Type 2 Diabetes Mellitus (diagnosed 10 years prior)
- No prior hospitalizations documented

Social History:

- Lives alone
- Unemployed

Family History:

- Type 1 and type 2 diabetes on the maternal side
- Mother has Chron's Disease
- History of endocrine cancers

Medications:

- Metformin 500mg twice daily (uncertain adherence)

Physical Examination:

- Upon arrival, the patient was unconscious with a Glasgow Coma Scale (GCS) score of 3 (indicating severe impairment of consciousness).
- Vital signs: Blood pressure 90/60 mmHg, heart rate 110 beats per minute, respiratory rate 28 breaths per minute, temperature 38.5°C (febrile).
- Skin: Dry, with poor turgor (indicating dehydration).
- Neurological: Unresponsive to verbal or painful stimuli.
- Fundoscopy: No signs of diabetic retinopathy.

Laboratory Investigations:

- **Blood tests:**
 - Serum glucose: 35 mmol/L (severely elevated)

- Potassium: 1.0 mmol/L (critically low)
- Arterial blood gas (ABG): pH 7.0, bicarbonate 10 mEq/L (severe metabolic acidosis)
- Ketones: Positive in serum and urine (indicative of DKA)
- Hemoglobin A1c (HbA1c): 12% (poorly controlled diabetes)
- **Imaging:**
 - CT scan of the abdomen and pelvis: Non-alcoholic fatty liver disease (NAFLD), cholelithiasis (gallstones), and a 3mm pancreatic polyp.

Diagnosis:

- Diabetic ketoacidosis (DKA) with severe dehydration and electrolyte imbalance (hypokalemia)
- Non-alcoholic fatty liver disease (NAFLD)
- Cholelithiasis (gallstones)
- Pancreatic polyp (uncertain significance)
- Right upper arm laceration with ulnar nerve transection

Emergency Department Management:

- Intravenous (IV) fluid resuscitation to address dehydration.
- Intravenous electrolytes, including potassium replacement to correct electrolyte imbalances.
- Administration of insulin to lower blood glucose levels and manage DKA.
- Broad-spectrum antibiotics for suspected sepsis due to the febrile state and altered mental status.
- Consultation with neurosurgery and plastic surgery teams.

Hospital Course:

The patient was admitted to the Intensive Care Unit (ICU) for close monitoring and continued management of DKA. Her blood sugar levels and electrolytes gradually normalized with treatment.

- **Plastic Surgery:** The patient underwent surgery to repair the transected ulnar nerve in her right arm. The prognosis for regaining function in her ring and pinky finger depends on the extent of nerve damage.
- **Gastroenterology:** The patient will be referred to a gastroenterologist for further evaluation of the NAFLD, cholelithiasis, and pancreatic polyp.

Discussion:

This case highlights the potential for severe complications in patients with poorly controlled diabetes. The patient's presentation with DKA and critical electrolyte imbalance (hypokalemia) could have been fatal without prompt medical intervention.

A potential trigger for DKA in this case could be an underlying infection, as suggested by the elevated temperature. However, further investigation is needed to determine the cause. The co-occurrence of NAFLD and cholelithiasis are common findings in individuals with T2DM. The 3mm pancreatic polyp requires further evaluation to rule out malignancy.

The ulnar nerve transection due to the laceration on the arm is a separate traumatic injury that further complicates the patient's condition. Surgery to repair the nerve offers the possibility of regaining function in the affected fingers, but the long-term prognosis depends on the extent of nerve damage.

Conclusion:

This case emphasizes the importance of diabetes management to prevent life-threatening complications like DKA. Additionally, the case highlights the potential for co-occurring medical conditions in diabetic patients and the need for comprehensive medical evaluation. Early diagnosis and intervention are crucial for optimal patient outcomes.