A case of diabetic ketoacidosis with hemorrhagic gastric ulcer

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A 69-year-old man was unable to eat, and his diet was limited to juice for 1 week preceding admission. He had no history of major illnesses, nor did he consume medication or alcohol. On the evening of his visit, he was found while lying down at home and was responsive, and was transported to the hospital via ambulance. Vital signs at the time of admission were 36.6°C temperature, 135/86 mmHg blood pressure (BP), 100 beats/min pulse, 20 breaths/min respiratory rate, and E4V4M6 Glasgow Coma Scale. Blood test results indicated the following: blood sugar, 1,025 mg/dl; Hb, 13.8 g/dl; blood urea nitrogen (BUN), 96 mg/dl; and creatinine, 3.7 mg/dl. Blood gas analysis revealed a 7.21 pH, 3.9 mEq/L HCO3 level, and anion gap (AG) of 34 mmol/L. He was hospitalized with a diagnosis of severe diabetic ketoacidosis (DKA). Although plain computed tomography (CT) showed a high-density area of 40–70 HU in the stomach, he had no abdominal symptoms. Therefore, this abnormality was overlooked on admission (Figure 1).

Infectious diseases, myocardial infarction, and acute pancreatitis were not observed. Continuous intravenous insulin infusion and fluid replacement were initiated. His BP did not drop the following morning. The input and output of fluid balance for 14 h after admission were 3,000 ml and 1,600 ml, respectively. One day posttreatment, blood tests revealed the following: blood sugar, 1,025 mg/dl; Hb, 13.8 g/dl; blood urea nitrogen (BUN), 96 mg/dl; and creatinine, 3.7 mg/dl. Blood gas analysis revealed a pH of 7.21, an HCO3 level of 3.9 mEq/L, and an AG of 34 mmol/L. He was hospitalized with a diagnosis of severe diabetic ketoacidosis (DKA). Although plain computed tomography (CT) showed a high-density area of 40–70 HU in the stomach, he had no abdominal symptoms. Therefore, this abnormality was overlooked on admission (Figure 1).

Diabetic ketoacidosis is sometimes complicated by gastrointestinal bleeding. However, cases requiring hemostasis are extremely rare. Badipatla et al. reported that upper gastrointestinal bleeding occurred in 22 (9%) of 234 DKA cases, and hemostasis was necessary only once (0.4%). In the current case, gastrointestinal bleeding was not apparent until the manifestation of shock and melena. However, the patient’s plain CT scan on admission showed a high-density area of 40–70 HU in the stomach. An earlier study reported a mean CT value of gastrointestinal bleeding to be 47 HU on plain CT, which was similar to that observed in this case.1 Further, on the morning following hospital admission, his Hb level decreased by 3.9 g/dl, and his BUN/creatinine ratio was increased.

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which was greater than the BUN/creatinine ratio of 26 measured on admission. In retrospect, the patient should have been diagnosed with hemorrhagic gastric ulcer before he experienced hemorrhagic shock. Mortality rates increase when DKA is complicated with upper gastrointestinal bleeding; thus, it is important to consider this possibility.

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Photographic consents: The consent is obtained from the patient.

**FIGURE 2** Upper gastrointestinal endoscopy findings. Large number of blood clots in the stomach. A1-stage gastric ulcer measuring 30 mm in diameter in the lesser curvature of the stomach. Pulsatile and eruptive bleeding from exposed blood vessels.

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**CONFLICT OF INTEREST**
The other authors have stated explicitly that there are no conflicts of interest in connection with this article.

**AUTHOR CONTRIBUTION**
All authors meet the ICMJE authorship criteria.

**CONSENT FOR PUBLICATION**
Informed consent has been obtained from the patient for the publication of this report.

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