

Duodenal Perforation Caused Septic Shock: a Rare Case Combined With Coronavirus Disease 2019

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Case report

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Abstract

Background: Duodenal perforation is one of the rarer causes of acute abdomen in pregnancy, which is especially easy to be overlooked during the outbreak of 2019 novel coronavirus (2019-nCoV) after delivery.

Case presentation: Here, we report a case of duodenal perforation-induced septic shock with coronavirus disease 2019 (COVID-19), and the patient underwent emergency laparotomy after reporting to the hospital management department under strict protection. Her recovery in postoperative period in Medical Intensive Care Unit (MICU) was uneventful and she was transferred to a designated hospital for treatment of COVID-19 5 days later.

Conclusions: The establishment of emergency green channel for maternal health care, and timely and comprehensive multidisciplinary cooperation during the epidemic period, strengthen the standardized management of high-risk pregnancy, and better guarantee the safety of mothers and infants.

Background

Acute abdomen in pregnancy represents a unique diagnostic and therapeutic challenge, acute abdominal pain in pregnancy can occur due to obstetric factors as well for reasons that are unrelated to pregnancy. Perforation of duodenal ulcer is one of the clinical acute abdomen, and it is a rare complication in pregnancy especially post-cesarean¹⁻³, which requires emergency laparotomy. This rare postoperative complication is easily misdiagnosed or regarded as paralytic intestinal obstruction. Delay in diagnosis and treatment can lead to adverse outcomes for the mother, so the need for a systematic clinical evaluation and investigation for an accurate and timely diagnosis of potentially life-threatening conditions is necessary.

Case Presentation

A 40 years old woman presented to the emergency department (ED) complaining of 5 days of developed nausea and vomiting, and 1 day of epigastric abdominal pain, she underwent cesarean section 1 month ago, and had no known predisposing factor for peptic ulcer disease. She had been to a local hospital for symptomatic treatment, and the time the pain did not improve, so she sought medical attention. On examination, the out-patient computed tomography (CT) scan of the chest and abdomen showed patchy shadow on the lower right lung and pneumoperitoneum. Laboratory studies are significant for elevated inflammatory indicators. The patient experienced syncope during the outpatient visit, and recovered after intravenous fluid replacement, and her vital signs were still unstable. Possibility of septic shock with a diagnosis of intestinal perforation was considered, and the patient underwent emergency laparotomy after reporting to the hospital management department under strict protection⁴⁻⁷.

During the preoperative preparation in the operating room, the patient experienced a loss of consciousness again, accompanied by a decrease in pulse oxygen saturation to 70% and blood pressure to 80/60 mmHg. And the anesthesiologist immediately gave tracheal intubation, mechanical ventilation to assist breathing, and fluid resuscitation, vasoactive drugs to maintain blood pressure. Intra-operatively, there were about 1.6 liters of yellow-green purulent fluid in the peritoneal cavity. The omentum adhered to the stomach and duodenum, with white pus masses on the surface. And 3 cm long perforation was found at the posterior wall of the duodenum, with gastric juice and bile flowing out. Rest of the gut was normal. During the operation, patients needed vasoactive drugs (norepinephrine 1ug/kg · min) to maintain blood pressure, and returned to Medical Intensive Care Unit (MICU) with tracheal catheter for isolation and monitoring.

On the day after surgery, the patient's bedside chest radiograph indicated: 1. Right pneumothorax (approximately 50% compression of the right lung); 2. Pneumonia; 3. Subcutaneous gas accumulation at the base of the bilateral neck and the right armpit. Then closed drainage of the right thoracic cavity was performed. Anti-infection, ventilator-assisted ventilation, fluid resuscitation and vascular active drug maintenance circulation, continuous gastrointestinal decompression, proton pump inhibitors for acid suppression and stomach protection, intravenous high nutrition support treatment, low molecular weight heparin prevents venous thrombosis.

On the third postoperative day, the patient's breathing and circulation were stable, and the tracheal tube was removed. And the 2019-nCoV nucleic acid test showed positive, she was continued to be isolated in the single room, reported in time according to the COVID-19 reporting process, and interferon antiviral treatment was added. On the 4th day after surgery, the patient's CT review showed: Multiple ground-glass opacities and patchy shadows of both lungs, combined with medical history, consider viral pneumonia; A small amount of pneumothorax on the right side, subcutaneous gas accumulation in both neck and chest wall, gas accumulation in mediastinum; A small amount of pleural effusion; Combined with medical history, consistent with abdominal postoperative changes, pelvic effusion. On the 5th

postoperative day, her 2019-nCoV nucleic acid test showed a positive again. Her vital signs were stable and she was transferred to a designated hospital for treatment of COVID-19.

Discussion

An important factor in the successful treatment of this case is timely and comprehensive multidisciplinary cooperation. Due to the need of epidemic prevention and control, surgical operations are suspended in some hospitals, and most patients, including pregnant women, were delayed in diagnosis and treatment during the epidemic. As the largest women's and children's health care hospital in the province, during this period, we have undertaken the majority of maternal consultations and treatments, including pregnant women with or without COVID-19, and the two-channel medical treatment process guarantees the safety of maternal and infant life in non-designated hospitals⁸. Currently, there are few cases of COVID-19 with duodenal perforation. In this case report, shock occurred due to the systemic inflammatory response to chemical peritonitis and fluid deficit. Sepsis is a complex clinical syndrome for patients with acute abdomen especially for perforation, which may be delayed and rapid worsening of condition that lead to multiple organ failure. After removing the cause of sepsis through emergency surgery, active early target-guided treatment and cluster treatment of sepsis are to reduce mortality rate⁹. And she was considered intestinal perforation and underwent emergency laparotomy with implemented strict infection control measures. Her recovery in postoperative period in MICU was uneventful and she was transferred to a designated hospital for treatment of COVID-19 5 days later. None of the medical staff involved in treating the patient were infected. Till the epidemic eased, two months later, she fully recovered and came to the hospital to express her gratitude.

In retrospect, we do not know the epidemiological history of the patient and how she contracted COVID-19. As far as we know, her family members are not infected, which makes it more difficult for us to prevent and control asymptomatic infection.

Conclusion

With the accumulation of knowledge and experience in diagnosis and treatment of COVID-19, the management strategy of high-risk pregnancy will continue to be summarized and improved. Finally, we call for the establishment of emergency green channel for maternal health care during the epidemic period, strengthen the standardized management of high-risk pregnancy, and better guarantee the safety of mothers and infants.

Declarations

Ethics approval and consent to participate

The patient agreed to participate in the study.

Consent for publication

All the authors approved the final paper.

Competing interests

There are no conflicts of interest.

Funding

None.

Authors' contributions

GHH wrote the manuscript, HJ collected the case data, LYX and XW completed the table and figures, and the corresponding author made constructive comments and revised the paper, all the authors agree to be accountable for all aspects of the manuscript.

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Not applicable.

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Tables

Table 1. The changes of infection indicators in patient.

	Feb. 11	Feb. 12	Feb. 13	Feb. 14	Feb. 15
Leukocyte count ($\times 10^9/L$)	19.48	12.80	11.02	13.34	12.04
Lymphocyte count ($\times 10^9/L$)	1.26	0.92	0.56	0.80	0.78
Neutrophil count ($\times 10^9/L$)	17.69	11.61	10.09	11.96	10.51
hs-CRP (mg/L)	548.39	341.69	278.17	109.77	83.69
PCT (ng/ml)	74.36	25.12	13.31	7.59	-

Abbreviations: Feb., February; hs-CRP, Hypersensitive C-reactive protein; PCT, Procalcitonin;

Note: -, Not detected.

Figures

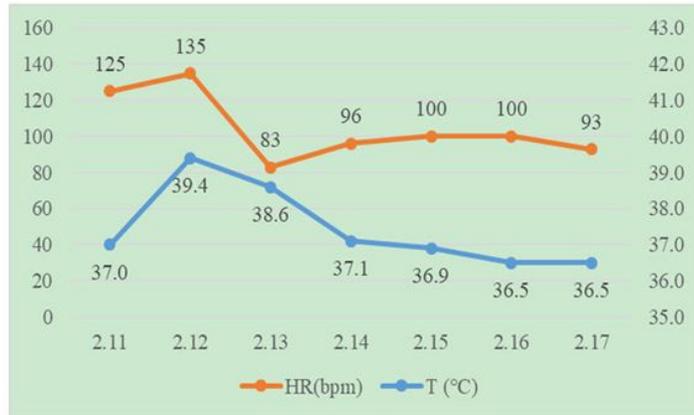


Figure 1

Changes in patients' heart rate (HR) and temperature (T).

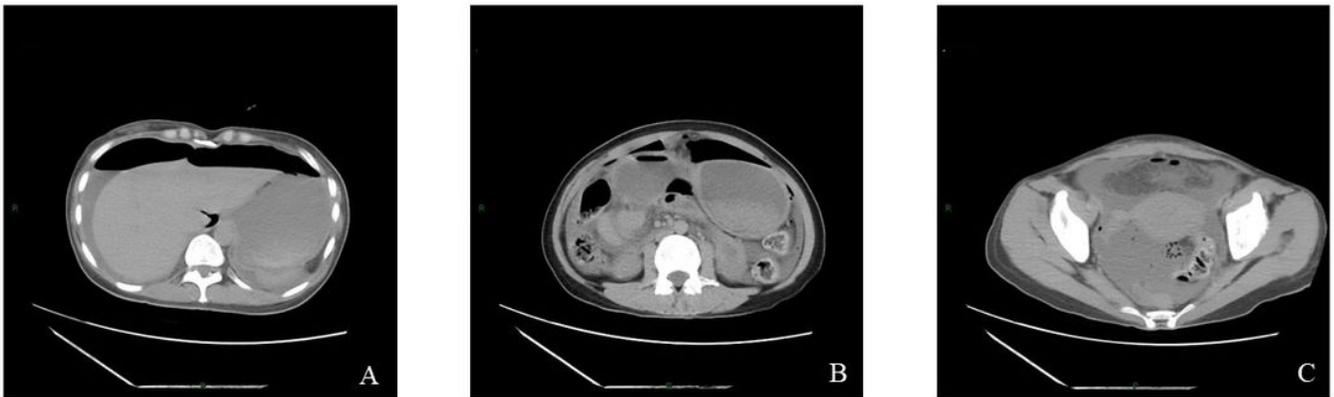


Figure 2

CT images of the patient's abdomen: A, B, C show pneumoperitoneum and multiple free air.

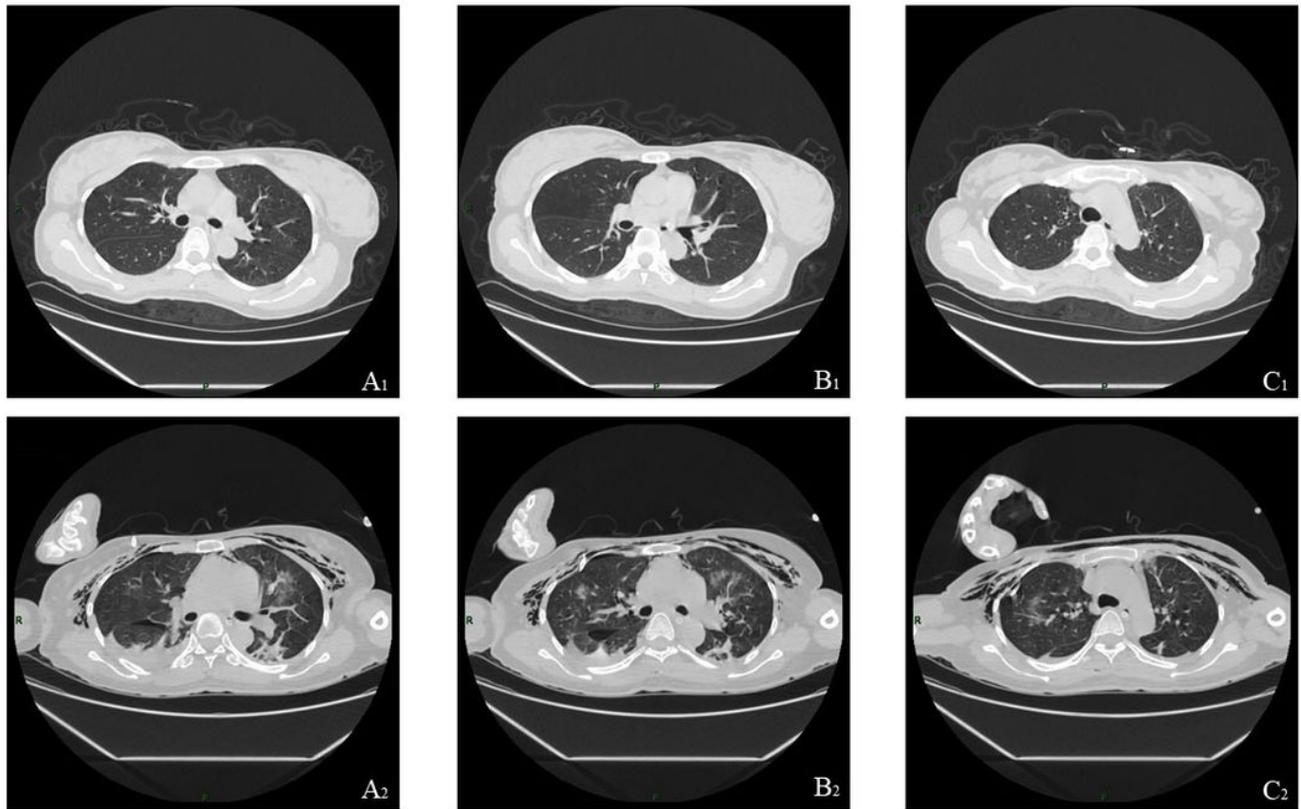


Figure 3

CT images of the patient's chest: A1, B1 and C1 were Feb 11, A2, B2 and C2 were Feb 16, the images in Feb 16 showed multiple ground-glass opacities and patchy shadows of both lungs, pneumothorax on the right side, subcutaneous gas accumulation in both neck and chest wall, gas accumulation in mediastinum and pleural effusion.