

RUSH it - Point of Care Ultrasound as a Crucial Diagnostic Tool: Case Report

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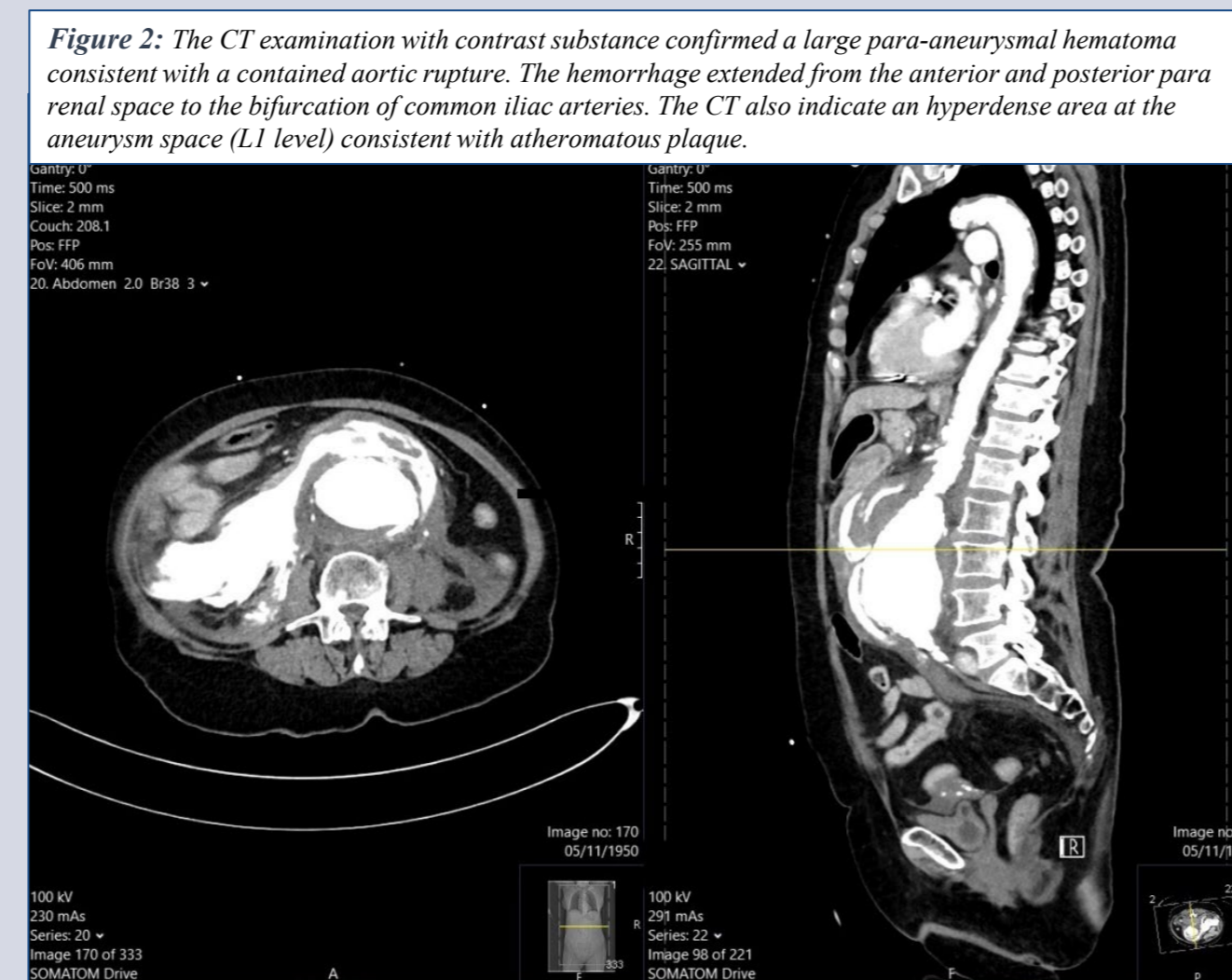
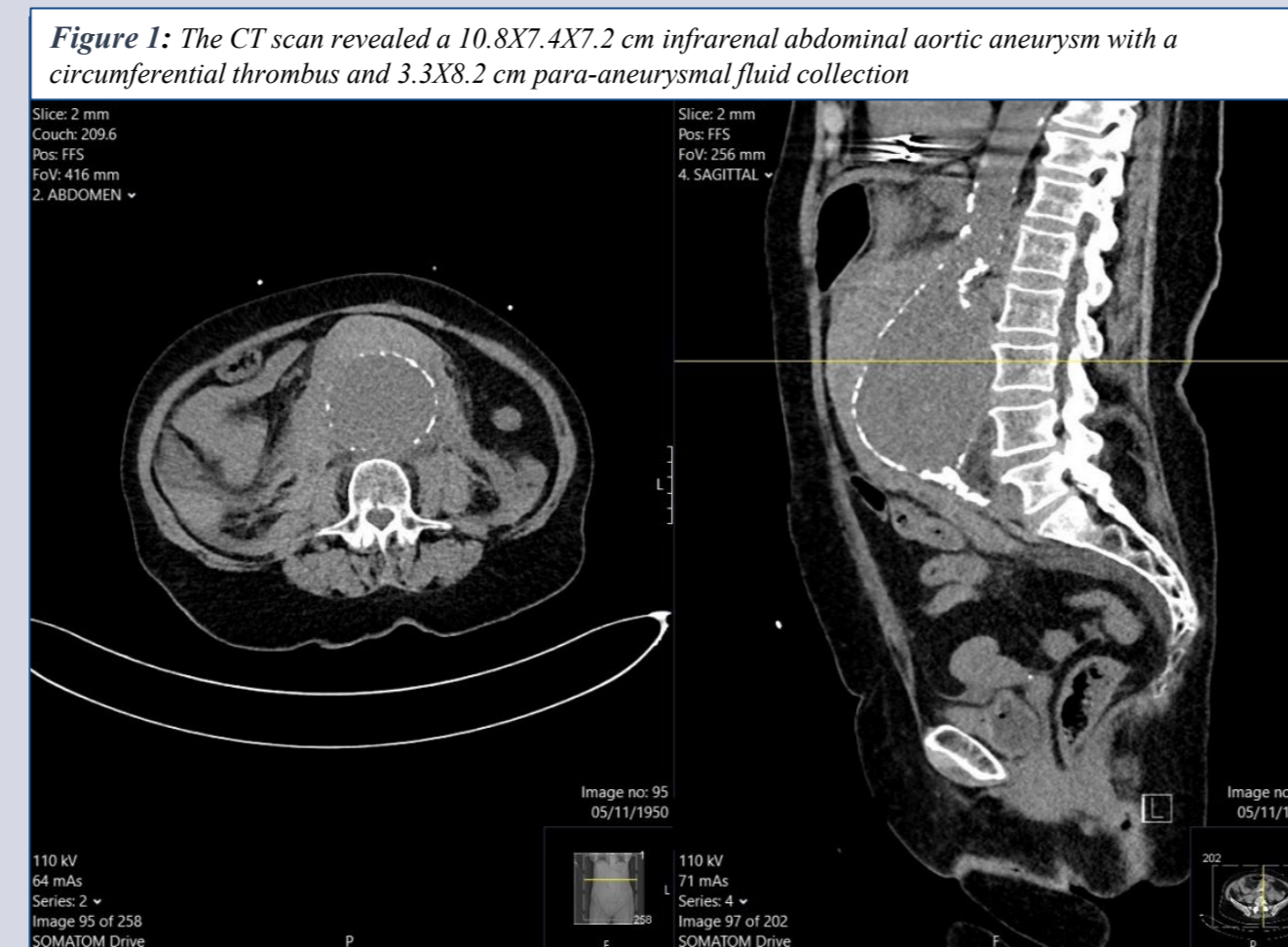
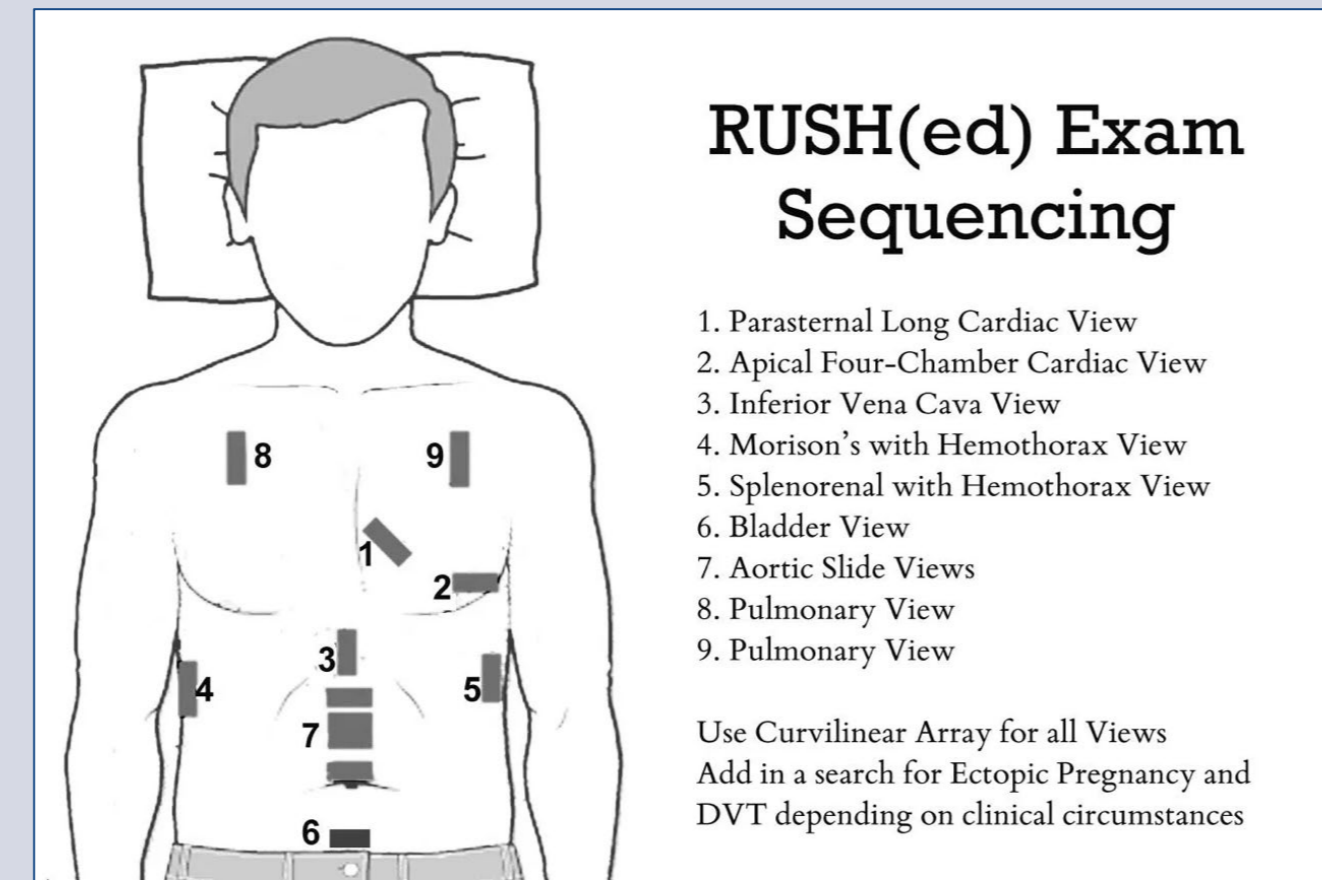
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Introduction

- Undifferentiated shock is a common clinical enigma, where delay in arriving at a correct diagnosis can have enormous impact on a patient's outcome.
- We present a case of undifferentiated shock that highlights the role of Bed-side ultrasound and the RUSH protocol in guiding the care of the patient in shock.
- This case represents a rare presentation of a ruptured AAA with a delay in diagnosis from a classic presentation for septic shock.

Case Presentation

- A 80-year-old woman presented to the Emergency Department (ED) after an episode of syncope with no associated trauma or convulsion.
- Chief complaint: 2 weeks of general deterioration, that exacerbated in the last 2 days. In addition, pain or itch in the lower left abdomen and groin
- The patient was discharged from another hospital a few days prior. During the admission, an ESBL positive Escherichia coli blood and urinary tract infection was detected.
- At first examination, the patient's vital signs were stable, she was relaxed, without any pain or respiratory distress.
- For further assessment, a head CT and chest X-ray was performed and found to be normal.
- An hour after her presentation she was re-evaluated and found to be in hypotension and the laboratory values were notable for infection (elevated WBC and CRP).
- She was treated with IV fluids and noradrenaline through central line and received a broad-spectrum antibiotic (Ertapenem) for the presumptive diagnosis of urinary sepsis that was partially treated.
- After blood pressure was stabilized, a CT of the abdomen and pelvis was performed in order to locate the source of infection.
- The CT scan revealed a 10.8X7.4X7.2 cm infrarenal abdominal aortic aneurysm with a circumferential thrombus and 3.3X8.2 cm para-aneurysmal fluid collection.
- Immediately after the CT the patient collapsed at the ED, underwent resuscitation and emergency thoracotomy with aortic cross clamp.
- Transported to the OR- Unfortunately, blood loss was extensive and although the emergency abdominal aortic aneurysm repair was performed, our patient died of uncontrolled bleeding through the ruptured wall.



RUSH exam	Hypovolemic shock	Cardiogenic shock	Obstructive shock	Distributive shock
Pump	Hypercontractile heart Small heart size	Hypocontractile heart Dilated heart size	Pericardial effusion, RV strain Hypercontractile heart	Hypercontractile heart (early sepsis) Hypocontractile heart (late sepsis)
Tank	Flat IVC Flat IJV Peritoneal fluid Pleural fluid	Distended IVC Distended IJV Lung rockets Pleural effusions, ascites	Distended IVC Distended IJV Absent lung sliding (PTX)	Normal/small IVC Normal/small IJV Pleural fluid (empyema) Peritoneal fluid (peritonitis)
Pipes	AAA Aortic dissection	Normal	DVT	Normal

	Step no. 1	Step no. 2	Step no. 3
Pump	Pericardial effusion: Effusion present? Signs of tamponade? Diastolic collapse of R Vent +/- R Atrium?	Left ventricular contractility: Hyperdynamic? Normal? Decreased?	Right ventricular strain: Increased size of RV? Septal displacement from right to left?
Tank	Tank volume: Inferior vena cava: Large size/small Insp collapse? -CVP high- Small size/large Insp collapse? -CVP Low- Internal jugular veins: Small or large?	Tank leakiness: (1) E-FAST exam: Free fluid Abd/Pelvis? Free fluid thoracic cavity? Pulm edema: Lung rockets?	Tank compromise: Tension pneumothorax? Absent lung sliding? Absent comet tails?
Pipes	Abdominal aorta aneurysm: Abd aorta > 3 cm?	Thoracic aorta aneurysm/dissection: Aortic root > 3.8 cm? Intimal flap? Thor aorta > 5 cm?	Femoral vein DVT? Noncompressible vessel? Popliteal vein DVT? Noncompressible vessel?

Discussion

- An abdominal aortic aneurysm (AAA) is a swelling (aneurysm) of the aorta.
- A growing aneurysm can burst (rupture), which leads to massive blood loss and shock [1].
- It is estimated that only 30-50% of cases present with the classic symptoms of abdominal and/or back pain, hypotension, and pulsatile mass [2].
- Patients often present with atypical or distracting symptoms. These cases are associated with clinical misdiagnosis at initial presentation, which could impair the chances of survival [1].
- Most intact AAAs are diagnosed incidentally when patients undergo imaging of the abdominal region for an unrelated condition.
- ED bedside ultrasound has a sensitivity of 99% and specificity of 98% for the detection of AAA, though it is much less useful in identifying rupture since most (88%) AAAs rupture into the retroperitoneal space, where ultrasound visualization is limited [2].
- Advanced ultrasound protocols such as the RUSH exam and an early use of bedside ultrasound in patients with hypotension, can accurately guide diagnosis, significantly reduce physicians' diagnostic uncertainty, and substantially change management and resource utilization in the emergency department.
- The RUSH (Rapid Ultrasound for Shock and Hypotension) protocol is a quick and easy ultrasound protocol that helps to differentiate between the different types of shock and identify the underlying cause [3].

Conclusion

It is our belief that The RUSH exam should be a part of the initial clinical evaluation of patients with hemodynamic instability, chest pain, or respiratory insufficiency to expedite the diagnostic evaluation, to initiate and to guide emergent treatment.

Clinical Significance

- The diagnosis of ruptured abdominal aneurysm should be considered in a presentation that has aspects of undifferentiated shock, especially in those whose presenting symptoms include new onset abdominal/back pain.
- When a patient presents with hypotension or shock especially if they have abdominal or back pain, RUSH protocol should be used as the primary diagnostic tool.

Contact

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- More information can be found in the full article (see QR code)



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