

8th Annual
RWJBH Stroke and Neurocritical Care Symposium

Case Review



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Overview

01 Let's Meet Our Patient

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02 History

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03 Imaging Review

Slide 07

04 Medical Decision Making

Slide 18

05 Return to the Case

Slide 00

06 Summary

Slide 00

Meet our patient



Irine Florenti

62 yo F history of type 2 diabetes, HTN, peripheral vascular disease who presents with acute speech difficulty and altered mental status.



Any history of cardiac arrhythmias like Afib?

No

No

Any blood thinners?

O
P
Q
R
S
T

What other information
do you want to know?

Any family history of bleeding or clotting disorders?

No

Has this happened before?

No

Mental Status

Awake, not attentive, not
answering questions

Moving all extremities
antigravity

Motor Exam

T 98°F
NSR 89 bpm
193/87
4LNC 98%

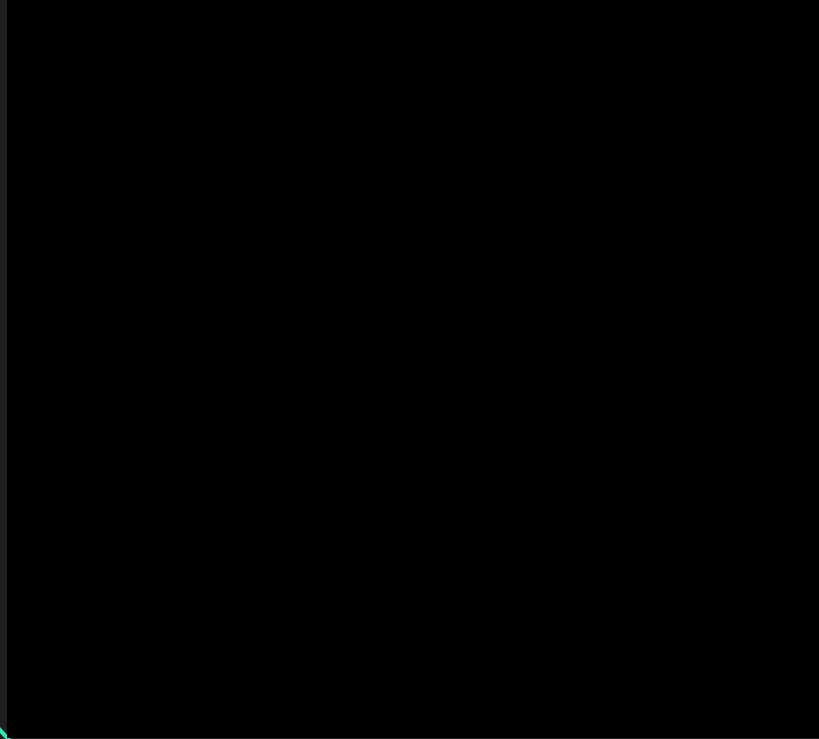
Sensory Exam

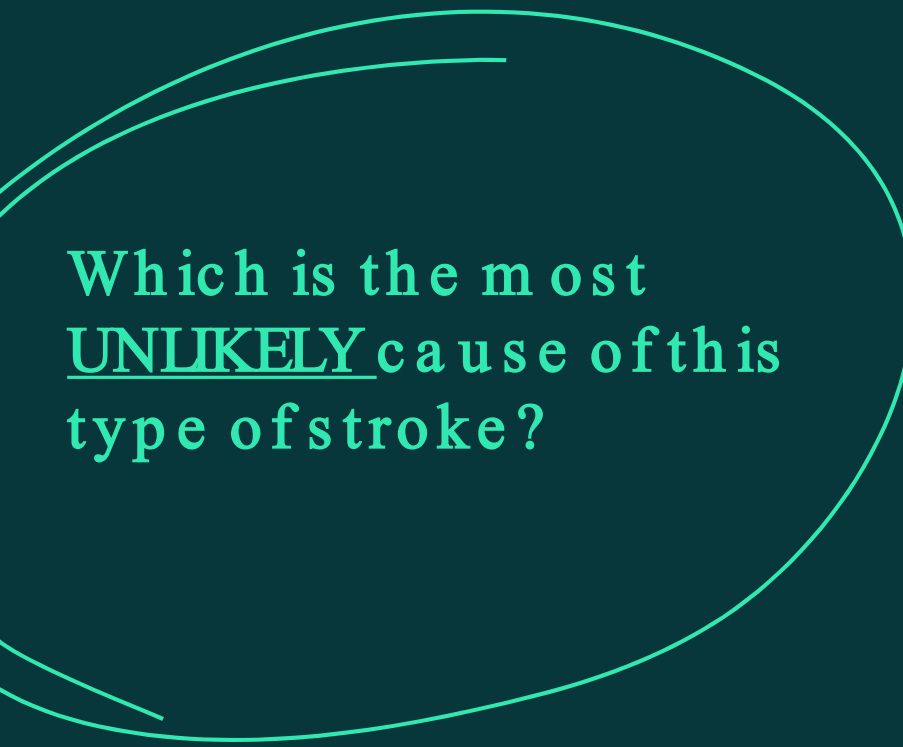
Grimaces to pain,
appears intact

Speech

No verbal output,
however able to follow
simple commands

Im a g i n g





Which is the most
UNLIKELY cause of this
type of stroke?

- A. Small vessel disease due to modifiable risk factors
- B. Cardioembolic
- C. Arteriovenous malformation
- D. Cavernous malformation

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What are you MOST
concerned about for Irine?

- A. Hematoma Expansion/Rebleeding
- B. Hydrocephalus
- C. ICP crises
- D. All of the above

What are you MOST concerned about for Irine?

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Neurocritical Care Admission

ICU team starts acute management of hemorrhagic stroke

- Airway, Breathing Circulation
- Reversal of antiplatelet or anticoagulant
- BP management
- ICP management



Neurosurgery Consulted

EVD placement at the bedside

- EVD cart
- Sterile kit with flushes and gloves



Imaging



ICP
8

NSGY asks for EVD to remain open at 10cm H2O.

During the rest of the night shift, you notice the patient is being more aware and alert!



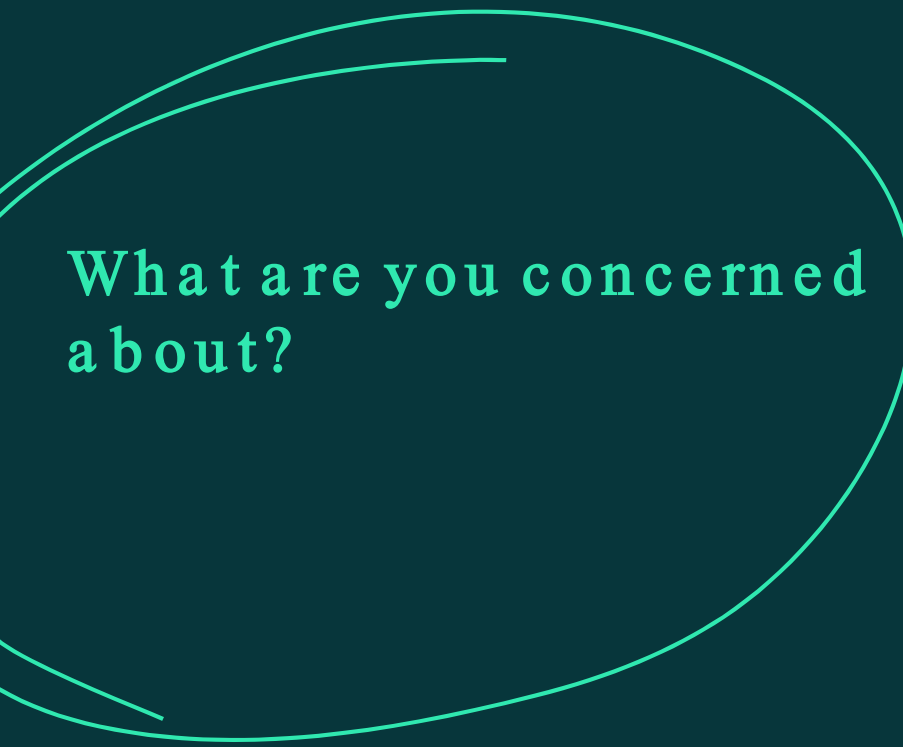
The NEXT Day

During hourly assessments,
you've noticed changes...

ICP
12



Time	GCS	Output	ICP
1000	E4 V3M6	15	10
1100	E3 V3M6	5	12
1200	E2 V2M5	2	14



What are you concerned about?

- A. Seizures
- B. ICU delirium
- C. Obstruction
- D. Rebleeding/Hematoma Expansion

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- C. Obstruction**
- D. Rebleeding/Hematoma Expansion

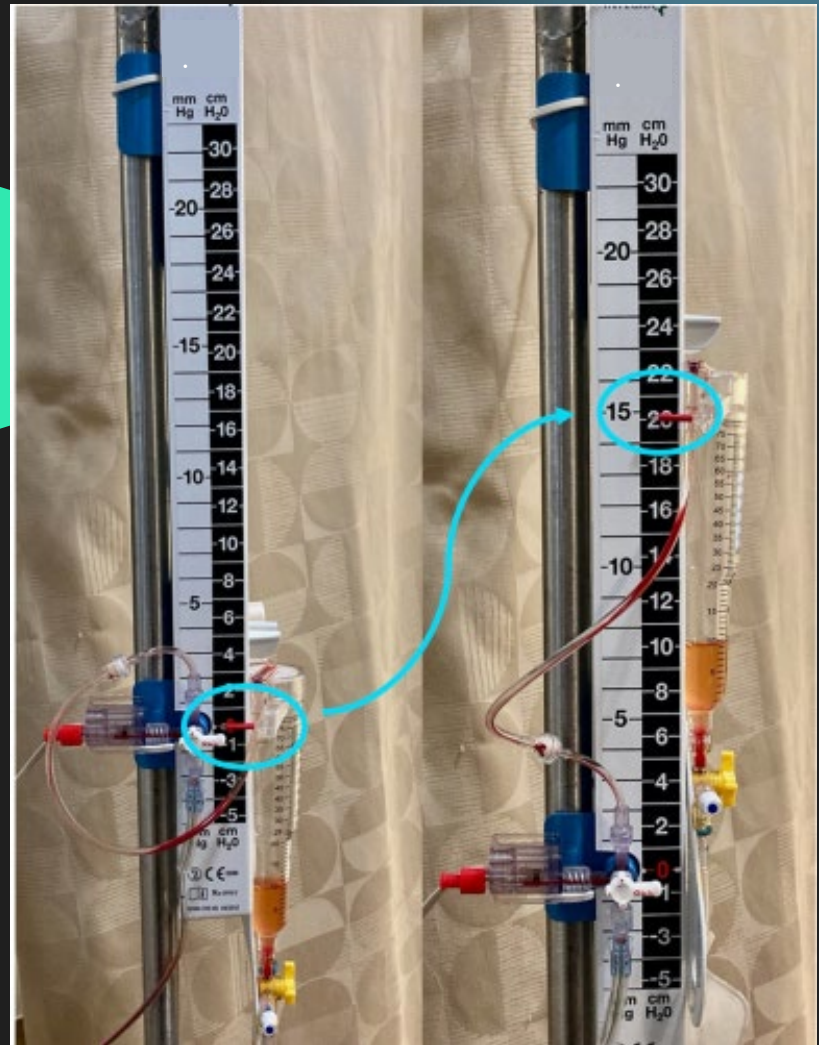
decreased
drainage,
ICP ↑
GCS ↓

New bright
red blood

A Keen Observation!

Provider
notified
and on
the way!

To decipher if there is an obstruction or imminent risk for obstruction, you briefly lower the EVD collection chamber below set point to visualize if drainage persists



Why does this matter?



Quick Recognition is Crucial!

Now What?

Evidence Based Practice:

- based on the trial CLEAR 3
- Instilling 1mg tPA into the ventricular system
- CT head without contrast daily to evaluate efficacy of intervention

Now What?

New Ongoing Strategies:

- Irrigation of the ventricular products to allow for quicker clearance and relief of obstruction
- Allowing for drainage, irrigation, and monitoring



Back to our Case...

Provider administers first dose of tPA
into the EVD and notifies you that the
EVD should remain clamped for 1 hour
after administration

You return to the room,
patient complains of a
headache

Luckily it is time to
unclamp the EVD but
there's no drainage. You
even try lowering the
drain...

**1 HOUR
LATER...**



What do you do next?

- A. Administer acetaminophen for headache
- B. Rezero the device
- C. Panic
- D. Check tubing clamps



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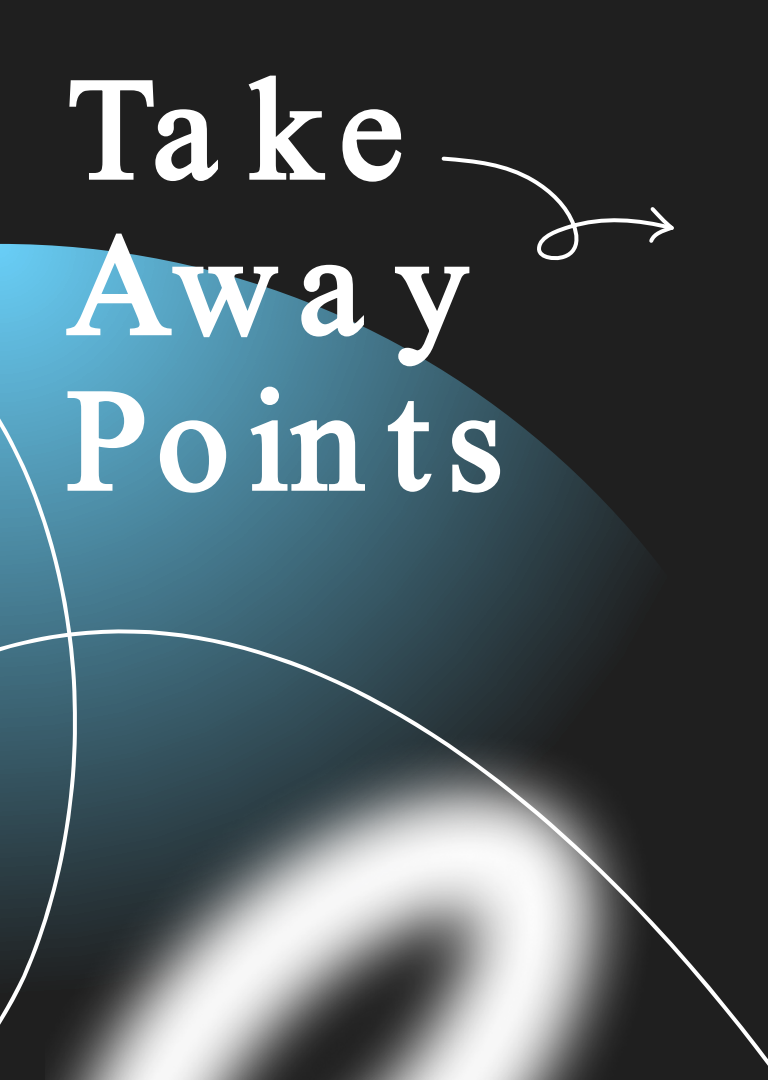
The proximal port was
clamped, so you reopen it.
Now the EVD starts
draining!



Irine Florenti

Irine continued to receive intraventricular tPA every 8 hours and after 2 days, her ventricular blood has decreased significantly! She remains in the ICU for the next 5 days as the team works on weaning the EVD. She ultimately tolerates clamping the EVD and it is removed by the Neurosurgery team.

Take Away Points



Hemorrhagic stroke involving ventricular hemorrhage imposes risk of hydrocephalus and possibly intracranial hypertension

The intraventricular hemorrhage can cause mechanical obstruction of CSF outflow through the EVD, requiring external assistance

Current evidence based practice supports promoting drainage and instilling tPA. Ongoing strategies include irrigation of the ventricles to support clearance of obstructive pathologies



Thank you!

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