

SCRIPT

ANGIOEDEMA COMPLICATION IN CONTEXT OF STROKE FIBRINOLYSIS



SCENARIO

#69

NAME

ADRIANNE MASON

SPECIALTY

Neurology

DIFFICULTY LEVEL

ADVANCED

SIMULATION ENVIRONMENT

INTRA HOSPITAL - EMERGENCY ROOM

Scenario

General description of the scenario info. Corresponds to the initial information presented to the trainee when selecting this scenario.

Title

Angioedema complication in context of stroke fibrinolysis

Context

Adrienne was in the grocery store when she suddenly felt difficulty moving the left side of her body. Bystanders immediately called the emergency team and she was brought to the hospital.

Briefing

Female patient, 60 years of age. She was brought to the Emergency Department due to sudden difficulty moving the left hemibody three hours ago. Previous medical background of high blood pressure, dyslipidemia and hyperuricemia.

General learning objective

Recognize symptoms of an acute ischemic stroke.

Specific learning objectives

Identification of indications and contraindications to Alteplase
Management of vital signs in acute stroke setting
Recognize orolingual angioedema as side effect of Alteplase
Management of lingual angioedema

Pre-simulation notes

-

Environment

Intra Hospital - Emergency Room

Specialty

Neurology

Difficulty Level

Advanced

Reviewers

Angels Initiative

Patient characteristics

Characterization of the patient's demographic, habits, behavior and specific status effects.

Avatar



Patient Name

Adrianne Mason

Age

60 years

Race/Ethnicity

European/Caucasian

Smoker

No

Sedated

No

Agitated

No

Facial palsy

-100

Eyelid closure

0

Gender

Female

Eye color

Blue

Conscious

Yes

Confused

No

Last meal over 2h

No

Speech impairment

No

Renal metabolic compensation

Auto

Patient parameters

These parameter values are used by the simulator to initialize this scenario.

Systolic arterial blood pressure (mmHg)

140

Heart rate (bpm)

70

Respiratory rate (/min)

12

Temperature (°C)

36.5

Urinary output (mL/kg/h)

0.6

Height (cm)

167

Diastolic arterial blood pressure (mmHg)

90

O2 saturation (%)

99

Blood glucose (mg/dL)

100

Hemoglobin (g/dL)

12

Weight (kg)

74

BMI

26.5

Potassium (mEq/L)

4.1

Sodium (mEq/L)

139

Physical examination

The items below characterize the patient's physical examination and monitoring findings on admission.

Airway

Airway observation

1st Priority

Airway is open, not obstructed and safe. No upper airway abnormal noises.

Breathing

Chest palpation

2nd Priority

Normal: 2L - normal; 2R - normal.

Chest percussion

2nd Priority

Right: 1R - resonance; 2R - resonance; 3R - resonance; 4R - resonance; 5R - resonance.
Left: 1L - resonance; 2L - resonance; 3L - superficial cardiac dullness; 4L - superficial cardiac dullness; 5L - resonance .

O2 Sat (%)

1st Priority

99

Pulmonary auscultation

1st Priority

Clear to auscultation, with normal vesicular murmurs in all sites.

Respiratory rate (/min)

1st Priority

12

Circulation

Blood pressure (mmHg)

1st Priority

140/90

Capillary refill time (s)

1st Priority

1.5

Cardiac auscultation

1st Priority

Regular rate and rhythm, normal S1 and S2 sounds, no murmurs, gallops or rubs.

Heart rate (bpm)

1st Priority

70

Pulse palpation

1st Priority

Central - Amplitude: strong; Rhythmic;
Peripheral - Amplitude: strong;
Rhythmic.

Urinary output (mL/kg/h)

1st Priority

0.6

Disability

Blood glucose (mg/dL)	1st Priority	100
Glasgow Coma Scale	1st Priority	> Initial: 15 - No impairment of consciousness (E = 4; V = 5; M = 6) > Severe Intracranial Hemorrhage: 4 - Severe impairment of consciousness (E = 1; V = 1; M = 2) > Severe Consciousness Impairment: 8 - Severe impairment of consciousness (E = 1; V = 3; M = 4)
Pupil light reflex	Not a priority	> Initial: Equal and reactive to light Right: Size - 4 mm; Right eye light: 2 mm; Left eye light: 2 mm. Left: Size - 4 mm; Right eye light: 2 mm; Left eye light: 2 mm. > Deterioration to severe intracranial hemorrhage: Mydriatic right pupil and right oculomotor nerve lesion

Exposure

Abdominal auscultation	2nd Priority	Normal hydro-aerial sounds without abdominal murmurs.
Abdominal palpation	2nd Priority	No rigidity. No pain. No guarding or signs of peritoneal irritation. No masses or palpable organomegalies.
Abdominal percussion	2nd Priority	6R - tympanic; 7R - tympanic; 6L - tympanic; 7L - tympanic.
Temperature (°C)	1st Priority	36.5

Dialogues

This is a complete list of all possible dialogue questions (on the left) and the corresponding responses (on the right).

History Taking

Chief Complaint

01. What happened to you?	1st Priority	I suddenly had difficulty moving the left side of my body.
02. Have you had a fall?	2nd Priority	No, there were some people next to me that held me and called the emergency number.

History of Present Illness

03. What were you doing when you felt ill?

[Available after question 1 is performed.]

I was walking in a grocery store. I was feeling quite normal before this happened.

2nd Priority

04. How long has it been since the symptoms started?

Three hours ago.

2nd Priority

Past Medical/Surgical History

05. Do you have high blood pressure?

Yes, I do.

Not a priority

06. Do you have high cholesterol?

Yes.

Not a priority

07. Do you have any other diseases?

Yes, I have high blood pressure, high cholesterol and uric acid.

1st Priority

08. Have you had any operations recently?

No.

1st Priority

Medications and Allergies

09. Are you currently taking any medication?

Yes, I am taking ramipril 5 mg once a day; rosuvastatin 10 mg once a day and allopurinol 100 mg once a day.

1st Priority

10. Are you taking any medication to prevent clots

Not that I know of.

or make your blood thinner?

[Available after question 8 is performed.]

2nd Priority

11. Do you have any allergies?

No, I don't think so.

1st Priority

Social History

12. What do you do?

I am retired.

Not a priority

13. Have you been under any stress lately?

No, I don't think so.

Not a priority

14. How often do you drink alcohol?

No, not really.

Not a priority

15. Do you smoke?

No, I've never smoked in my life.

Not a priority

Medical Tests

The items below describe the possible test results in this scenario, including rules that may affect those results.

Decision aids

Stroke scale (NIHSS)

1st Priority

> Hemorrhagic stroke: 7 - Moderate stroke
> Hemorrhagic transformation: 29 - Severe stroke
> After stroke treatment: 4 - Minor stroke

Electrophysiology

12-Lead ECG

Not a priority

Sinus rhythm.

Imaging

Cerebral angiography	1st Priority	Occlusion of distal M2/proximal M3 branch of the right middle cerebral artery. No other occlusions or vascular malformations are visible.
Chest CT	Not a priority	Absence of significant changes of pulmonary parenchyma density and pleural effusion.
Chest X-Ray	Not a priority	The lungs are clear. The heart is normal in size. The mediastinum is within normal limits.
Head CT	1st Priority	No evidence of focal lesions in the brain parenchyma. Cerebral ventricles of normal volume for the patient's age. Basal subarachnoid cisterns with normal configuration. Slight arterial calcifications on vertebral arteries and carotid siphons. ASPECTS: 10.
Neck Doppler ultrasound	Not a priority	Normal carotid artery flow.
Transcranial Doppler	2nd Priority	An occlusive TIBI 3 flow is visible in the right middle cerebral artery with increased flow in the ipsilateral anterior cerebral artery. These data indicate occlusion in the M2/M3 segment of the right middle cerebral artery, with good collateral flow.
Transesophageal echocardiogram	Not a priority	No alterations.
Transthoracic echocardiogram	Not a priority	No alterations found to cardiac morphology. Normal left ventricular systolic function.

Lab tests

Arterial blood gas	Not a priority	Decrease in Hemoglobin.
Blood pH - 7.39 Hemoglobin (g/dL) - 12 PaO2 (mmHg) - 132 PaCO2 (mmHg) - 42.2 HCO3- (mEq/L) - 25.3 BE (mEq/L) - 0.8 O2 sat (%) - 99 Na+ (mEq/L) - 139 K+ (mEq/L) - 4.1		

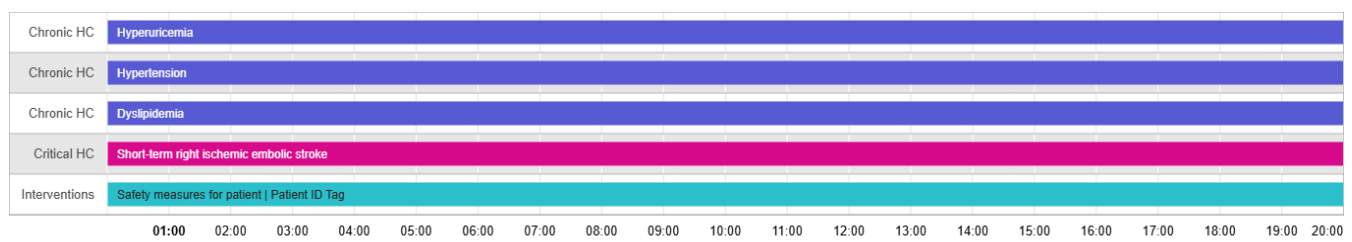
		Cl ⁻ (mEq/L) - 102.4 Anion gap (mEq/L) - 11.34 Lactate (mg/dL) - 9.0 Lactate (SI) (mmol/L) - 1
		Due to simulation of test imprecision, there may be slight differences in the actual results.
Biochemistry	2nd Priority	No alterations. Blood glucose (conventional) (mg/dL) - 100 Blood glucose (SI) (mmol/L) - 5.6 BUN (mg/dL) - 19 Serum creatinine (mg/dL) - 0.9 Creatinine clearance (mL/min) - 78 GFR (mL/min/1.79m ²) - 61.38 Na ⁺ (mEq/L) - 139 K ⁺ (mEq/L) - 4.1 AST (IU/L) - 21.4 ALT (IU/L) - 33 AST/ALT - 0.65 AP (IU/L) - 81 CK (IU/L) - 114 Osmolarity (mOsm/L) - 290 CRP (mg/L) - 2.5
		Due to simulation of test imprecision, there may be slight differences in the actual results.
Cardiac biomarkers	Not a priority	No alterations. CK-MB Mass (ng/mL) - 2 Troponin I (ng/mL) - 0.01 Myoglobin (ng/mL) - 17
Coagulation tests	Not a priority	No alterations. aPTT (s) - 36 Prothrombin time (s) - 12 INR - 1
Complete blood count	2nd Priority	Decrease in Hemoglobin and Hematocrit. Leukocytes (/μL) - 8502 Neutrophils (/μL) - 4502

		Lymphocytes (/μL) - 3202 Monocytes (/μL) - 412 Eosinophils (/μL) - 282 Basophils (/μL) - 112 Immature granulocytes (/μL) - 3 Erythrocytes (×10 ⁶ /μL) - 3.9 Hemoglobin (g/dL) - 12 Hematocrit (%) - 35.4 MCV (μm ³) - 90 MCH (pg/cell) - 29.5 MCHC (g/dL) - 34.5 RDW (%) - 11.5 Platelets (×10 ³ /μL) - 217
		Due to simulation of test imprecision, there may be slight differences in the actual results.
Lipid profile	Not a priority	Increase in Total cholesterol, Triglycerides, LDL cholesterol and Cholesterol ratio. Decrease in HDL cholesterol. Total cholesterol (mg/dL) - 207 Triglycerides (mg/dL) - 156 HDL cholesterol (mg/dL) - 31 LDL cholesterol (mg/dL) - 145 Cholesterol ratio - 6.7 Due to simulation of test imprecision, there may be slight differences in the actual results.
Urinalysis	Not a priority	No alterations. Specific Gravity - 1.024 pH - 6.0 Urine color - Yellow Appearance - Clear WBC Esterase - Negative Protein - Negative Albumin - Negative Glucose - Negative Ketones - Negative Erythrocytes - Negative Bilirubin - Negative Urobilinogen, Semi-Qn - 0.0 Nitrite, Urine - Negative

Volume of urine 24h (mL) - 1066

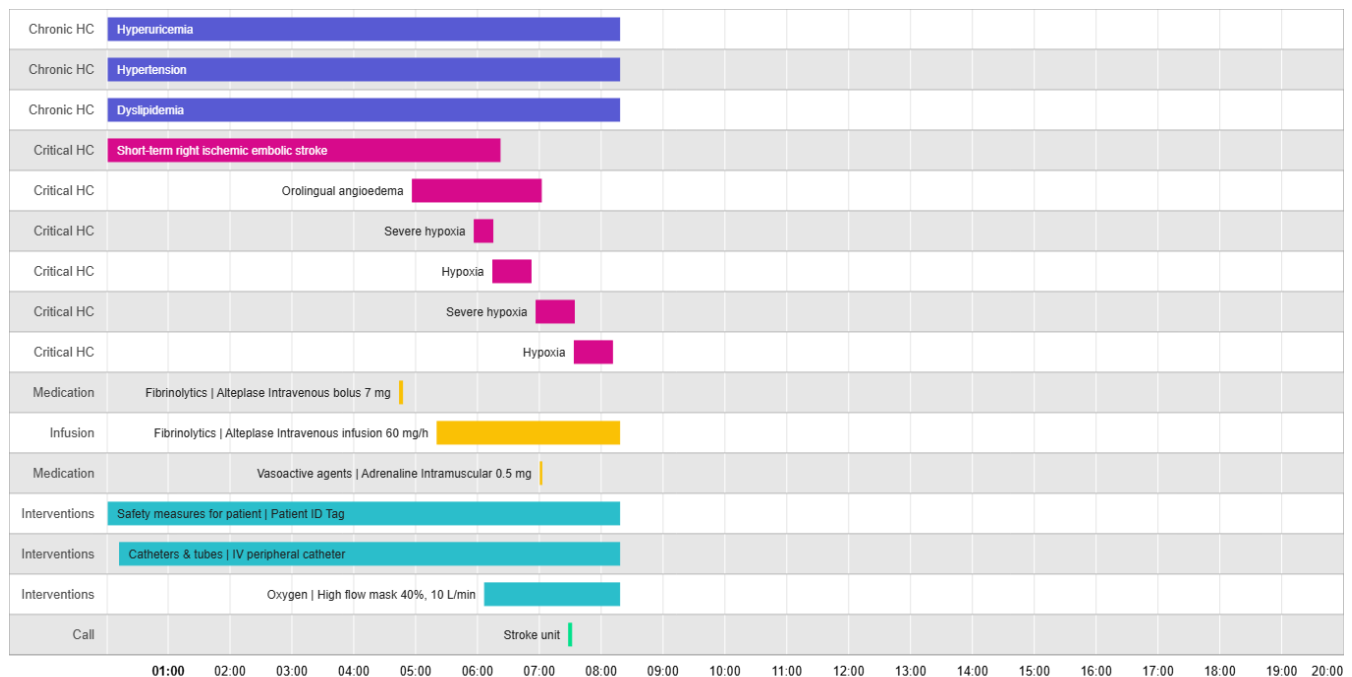
Baseline

This section is automatically generated and predicts scenario behavior assuming no actions by the trainee, which usually represents the worst-case scenario.



Optimal clinical approach - International

This section previews how the optimal approach resolves the scenario successfully. Comparison with Baseline may be useful to understand the scenario behavior.



Management

The items below represent management actions relevant to solving this clinical scenario. Notes: 1st Priority – Mandatory items required for a successful outcome. 2nd Priority – Optional items considered adequate but not essential. Not a Priority – Unnecessary items that are inadequate or a waste of time.

i.1 - Administer oxygen or ventilate after deterioration to orolingual angioedema

1st Priority

Interventions | Oxygen | High flow mask

Interventions | Oxygen | Nasal cannula

Interventions | Ventilation - Mechanical | Invasive ventilation (with orotracheal tube)

i.35 - Acute Ischemic Stroke - Fibrinolytics

1st Priority

Medications | Fibrinolytics | Alteplase

i.36 - Orolingual Angioedema AND Cardiac Arrest - Vasoactive agents

1st Priority

Medications | Vasoactive agents | Adrenaline

i.37 - Orolingual Angioedema - Anti-Inflammatories

2nd Priority

Medications | Anti-inflammatories | Methylprednisolone

Medications | Anti-inflammatories | Hydrocortisone

i.38 - Orolingual Angioedema - Antihistamines

2nd Priority

Medications | Antihistamines |
Chlorphenamine

Medications | Antihistamines |
Clemastine

Medications | Antihistamines |
Ranitidine

i.39 - Orolingual Angioedema - Fluids&Ions

2nd Priority

Medications | Fluids &
Electrolytes | Fluids IV -
Crystalloid

i.40 - Call to treat Acute Ischemic Stroke

1st Priority

The stroke unit has been notified.

Call | Stroke unit

Question(s) during the simulation

Questions presented to the trainee in order to have a more detailed evaluation of the use of the clinical scenario.

Head CT question:

Question

Based on the patient's clinical assessment and the head CT findings, select the most likely diagnosis:

Correct answer

Acute ischemic stroke

2 Incorrect answer(s)

Hemorrhagic stroke

Epileptic seizure

Head CT question:

Question

Does this CT have signs of any intracranial hemorrhage?

Correct answer

No

1 Incorrect answer(s)

Yes

Head CT question:

Question

Based on the neurological assessment, please rate the stroke severity:

Correct answer

Moderate stroke

2 Incorrect answer(s)

Minor stroke

Severe stroke

Head CT question:

Question

Are there any contraindications for thrombolysis?

Correct answer

No

1 Incorrect answer(s)

Yes

Cerebral angiography question:

Question

Which vascular lesion is visible?

Correct answer

Occlusion of the M3 segment of the right MCA

2 Incorrect answer(s)

No occlusion is visible

Occlusion of the right posterior cerebral artery

Cerebral angiography question:

Question

What is the extent of the established ischemic infarct in the CT scan?

Correct answer

No changes. ASPECTS: 10

2 Incorrect answer(s)

Moderate lesion. ASPECTS: 6

Large infarct. ASPECTS: 3

**Cerebral angiography
question:**

Question

Does this patient have an indication for thrombectomy?

Correct answer

No

1 Incorrect answer(s)

Yes

Question(s) after simulation

Questions presented to the trainee in order to have a more detailed evaluation of the use of the clinical scenario.

**Summative Multiple Choice
Question:**

Question

What is the most likely diagnosis?

Correct answer

Ischemic stroke

3 Incorrect answer(s)

Epileptic fit

Anxiety crisis

Asthma exacerbation

**Formative Multiple Choice
Question:**

Question

Which of the following are possible severe complications of treatment with thrombolysis?

Correct answer

Orolingual angioedema

2 Incorrect answer(s)

Complete AV block

**Formative Multiple Choice
Question:**

Question

If orolingual angioedema occurs during thrombolytic therapy, what is the correct response?

Correct answer

Stop thrombolytic infusion, administer adrenaline, and maintain a permeable upper airway

2 Incorrect answer(s)

Administer adrenaline, and maintain thrombolytic infusion

Maintain a permeable upper airway and thrombolytic infusion

**Formative Multiple Choice
Question:**

Question

What is the correct approach to managing severe allergic reactions in emergency settings?

Correct answer

The protocol should be displayed in an easily accessible location

2 Incorrect answer(s)

All health professionals should know the protocol, with no need to display it

There is no need for a specific protocol to severe allergic reactions, and the decision should be made case by case

Handoff question

Question presented to the trainee to assess their ability to effectively communicate patient information during a transition of care. This question is optional.

Question

Summarize this Body Interact scenario using a structured handoff pattern.

Review handoff pattern

SBAR (Situation, Background, Assessment, Recommendation): Includes current condition and reason for handoff, relevant history and context, assessment details, and recommended actions.

SOAP (Subjective, Objective, Assessment, Plan): Covers patient-reported symptoms and history, measurable data and findings, clinical impressions and diagnoses, and the treatment plan.

I-PASS (Illness Severity, Patient Summary, Action List, Situation Awareness and Contingency Planning, Synthesis by Receiver): Encompasses illness status, patient background, tasks and actions, potential changes and plans, and confirmation of understanding.

AT-MIST (Age, Time of incident or onset of symptoms, Mechanism of injury/Medical Complaint, Injuries or Inspections head-to-toe, vital Signs, and Treatments): Describes the cause of injury or medical complaint, findings from head-to-toe inspection, vital signs, and treatments provided.

Simulation Ending Messages

Feedback messages shown to the user based on specific successful or unsuccessful approaches, triggered by defined conditional rules.

Title	Type	Message	Conditional
Optimal	Success	Excellent work! You gathered the full clinical history and ensured comprehensive patient care. This thorough approach guarantees safe and accurate management, allowing you to better meet your patient's needs. Keep it up!	If all health conditions are treated the case ends with full success after 45 seconds. These conditions do not have to be treated: Severe consciousness impairment, Hyperglycemia, Severe hyperglycemia, and Hypoxia.
Failure due to Intracranial hemorrhage	Failure	The patient suffered a severe intracranial hemorrhage.	If the patient experienced a severe intracranial hemorrhage the case fails and ends after 2 minutes.

References

1. ESO Executive Committee, ESO Writing Committee. Guidelines for management of ischaemic stroke and transient ischaemic attack 2008. *Cerebrovascular Diseases*. 2008;25(5):457-507.
2. Powers WJ, Rabinstein AA, Ackerson T, et al. 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. March 2018.
3. Soar J, Pumphrey R, Cant A, et al. Emergency treatment of anaphylactic reactions - Guidelines for healthcare providers. *Resuscitation*. 2008;77(2):157-169.
4. Wahlgren N, Moreira T, Michel P, et al. Mechanical thrombectomy in acute ischemic stroke: Consensus statement by ESO-Karolinska Stroke Update 2014/2015, supported by ESO, ESMINT, ESNR and EAN. *International Journal of Stroke*. 2016;11(1):134-147.
5. Hill MD, Barber PA, Takahashi J, Demchuk AM, Feasby TE, Buchan AM. Anaphylactoid reactions and angioedema during alteplase treatment of acute ischemic stroke. *Canadian Medical Association Journal*. 2000;162(9):1281-1284.