FORENSIC AUTOPSY REPORT
CASE NUMBER: 13

Name of the Decedent: Identity withheld
Age: 27
Sex: Female
Date and Time of Autopsy: 5:00 PM, 27th September 2025
Time of Discovery: 6:00 AM, 27th September 2025
Performed By: R. Amisa, Medical Trainee under Supervision, Moncton Medical Center
Location of Autopsy: Forensic Pathologist Lab, University Medical Teaching Hospital
Authority Requesting Autopsy: Office of Medical Examiner

Summary of Case:

The victim was found posed in a seated position inside the museum storage room. ID badge missing. Unusually cold temperature due to a faulty thermostat. A single black feather on the floor beside her shoe.

Evidence / Observations from Scene:

- A single feather (black, 12 cm) on the floor beside her shoe — does not match any birds in the museum's taxidermy collection.
- The victim posed in a seated position with her hands clasped as if praying.
- Security cameras show her entering the room alone at 11:32 PM.
- An ancient dye sample from a rare plant belonging to genus aconitum (kept locked) is missing from its cabinet. That dye is known historically to contain a toxic alkaloid when improperly handled.

Condition of Body upon Arrival:

- Skin pale with bluish lips.

- Eyes open, pupils pinprick-sized.
- No present defensive or overt wounds.
- No sign of decomposition or insect activity.

External Examination:

Apparent Sex: Female
Height: 5’5” ft / 165 cm
Weight: 130 lbs/ 59 kg
Build: Well-nourished and well-developed adult female
Ethnicity: East Asian descent

Head and Face:

- **Hair:** Black, shoulder-length hair.
- **Eyes:** Brown, open. No obvious xanthopsia or corneal opacification present.
- **Skin:** Pale skin
- **Nails:** Short; tiny crystalline residue under fingernails (unknown substance).
- **Dentition:** Intact, no recent dental work
- **Ears:** Small puncture wound behind the right ear, no blood pooling.

Clothing:

- **Outer garment:** Light blue knee-length museum lab coat (poly-cotton blend), front snap closures. Left sleeve cuff with faint brownish smear (collected for trace analysis). Name badge clip attached but badge itself missing.

- **Inner garments:** Dark grey fitted T-shirt (cotton), no visible defects or stains. Black skinny jeans (denim) with small abrasion on the right knee (non-recent wear). Black leather belt with silver buckidneye.
- **Hand Protection:** Nitrile disposable gloves (light purple) on both hands
- **Undergarments:** Black cotton undergarments; no defects.
- **Feet:** Black low-top canvas sneakers with white rubber soles; laces tied; small dust and textile fibers on soles consistent with museum storage area.

- **Accessories:** Small silver stud earrings; simple silver band ring on right middle finger. No watch. No necklace.

NECK

- No ligature mark or abrasions
- No palpable hyoid fracture
- No defensive scratches or bruises
- No petechiae on remaining conjunctiva or facial skin

Limbs:

- Light crystalline residue on the right thumb and index finger.
- Small healed scar on left knee (~2 cm)

Injuries:

- **Puncture wound:** 0.3 cm in diameter located 1.2 cm posterior to the right ear at the mastoid region. Surrounding faint erythema.
- **Subcutaneous bruising:** Slight, faint, 2.0 × 1.0 cm area of discoloration on anterior neck, not full circumferential.

Postmortem changes:

- Rigor mortis present in extremities
- Mild livor mortis present posteriorly
- No insect activity noted.
  Summary:
  - No overt evidence of struggle or disturbance.
  - Small puncture wound behind the right ear, no blood pooling.
  - Tiny crystalline residue under fingernails (unknown substance).

Internal Examination:

- **Head:** No scalp hemorrhage except mild around the puncture area. Others are unremarkable.
- **Brain:** Mild congestion; no edema or herniation noted.

- **Neck:** Soft tissues of the neck reveal minimal subcutaneous hemorrhage near the puncture site. No fractures of hyoid bone or thyroid cartilage
- **Cardiovascular System:** Normal size and configuration. Coronary arteries patent. Ribs intact. No fluid or hemorrhage.
- **Lungs:** Presence of mild pulmonary edema; cut surfaces exclude small amounts of frothy fluid.
- **Stomach**: 50 mL semi-clear fluid with faint plant-like odor; no gross solids
- **Genitourinary System:** Unremarkable.
- **Liver:** Normal size; reddish-brown, congested; no gross lesions.
- **Spleen:** Dark red, soft, congested.
- **Kidneys**: Capsure striped easily.

Organ/ System	**Weight**	**Notes**
Brain	1,270 g	Mild congestion
Heart	290 g	Unremarkable
Right Lung	470 g	Mild pulmonary edema
Left Lung	430 g	Mild pulmonary edema
Liver	1,350 g	Congested
Spleen	120 g	Dark red and congested
Right Kidney	130 g	Capsule easily striped; cortex well-demarcated
Left Kidney	125 g	Same as right
Stomach	50 ml	Semi-clear fluid with faint plant-like odor
Pancreas	90 g	Pale pink, lobulated, unremarkable.
Adrenal glands	9 g each	Unremarkable
Uterus	60 g	Normal, non-gravid
Ovaries	4 g each	Normal

Thyroid	20 g	Grossly normal

Toxicology Report Summary:

- **Blood (Femoral):** High levels of aconotine detected. No other substance was detected.
- **Urine:** Trace aconotine.
- **Stomach:** Low amount of aconitine. No presence of pills/ capsules noted.
- **Liver tissue:** Detectable aconitine.
- **Kidney tissue:** Detectable aconitine.

Interpretation: The chemical, aconitine, was in her bloodstream before death in a dose high enough to cause fatal effects. No other poison, drug, or ethanol was found.

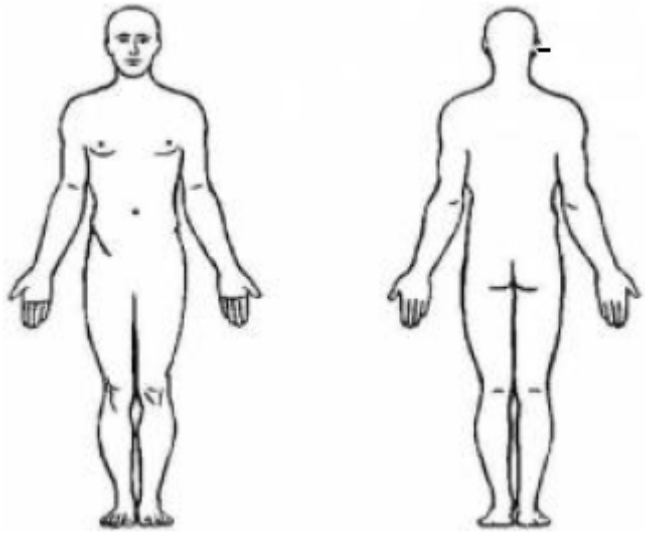
Discussion:
The deceased was found in a seated position with her hands clasped together. The injection wound behind her right ear and mild subcutaneous bruising indicate that the offender had medical knowledge. Toxicology report reveals high dose of aconitine. The contributing factor can be small amount of ethanol—likely not causative.

Taken together, the most probable cause of death is aconitine poisoning. The manner of death is best classified as homicide, with no strong forensic support for suicide or natural.

Cause of Death: Acute aconitine poisoning.
Mechanism of Death: Channel activation→ Persistent depolarization→ neurologicalogical effects→ Ventricular trachycardia→ Cardiac arrest
Manner of Death: Homicide

Evidence Supporting Homicide:

- The body's praying position indicates that the body was moved postmortem by the offender, possibly an attempt for ritualistic behavior.
- The black feather of a bird (12 cm ; doesn't match any bird in the museum's taxidermy collection.) supports the symbolic intention of the offender.
- The missing ancient dye sample of a plant from genus aconitum was likely used by the offender to kill the victim.
- The use of a fine needle in injecting the poison behind the victim's ears indicates that the offender has enough medical knowledge to avoid blood pooling and evidence of disturbance. They also likely worked in that museum, proved by no sign of forced entry and lack of disturbance in their presence.



Signature

Ruhi A.

Medical Trainee under Supervision

27th September 2025

Raw Toxicology Report—

Specimens submitted

- **Peripheral blood (femoral)** — 10 mL, grey-top (aconitine)
- **Central blood (cardiac)** — 5 mL, red-top
- **Urine** — 30 mL
- **Stomach contents** — 50 mL (aqueous slurry)

- **Liver tissue** — 20 g (frozen)
- **Hair (occipital, 3 cm)** — for long-term exposure screening

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Screening (immunoassay / headspace / GC-MS screen)

- **Ethanol (blood, peripheral): 20 mg/dL (0.02 g/dL)** — low, consistent with recent light alcohol use.
- **Volatile organic screen (headspace):** negative for methanol, isopropanol, acetone above reporting limits.
- **Benzodiazepines (immunoassay):** negative (confirmatory GC-MS pending for trace-level benzodiazepine metabolites).
- **Opioids (immunoassay):** negative for morphine/codeine/oxycodone above screening cutoffs.
- **Amphetamines / methamphetamine:** negative.
- **Cocaine / benzoylecgonine:** negative.
- **Tricyclic antidepressants / common antipsychotics (screen):** negative.
- **Organophosphate/carbamate cholinesterase testing (butyrylcholinesterase activity):** within normal postmortem variation (no acute cholinesterase inhibition detected).

Targeted forensic analytic findings (LC-MS/MS & GC-MS confirmation)

Note: targeted panels used reference-standard confirmation and isotope-dilution quantitation where available.

- **Aconitine (parent alkaloid)**

    - **Peripheral blood (femoral): 18 ng/mL (±10%) — CONFIRMED (LC-MS/MS)**
    - **Cardiac blood: 42 ng/mL (±10%) — CONFIRMED (LC-MS/MS)**
    - **Liver tissue: 280 ng/g (wet weight)** — CONFIRMED
    - **Urine: trace (<1.0 ng/mL), aconitine metabolites present** — CONFIRMED
    - **Hair (proximal 3 cm):** non-detect for aconitine (suggests acute exposure rather than chronic).
    - **Interpretation:** presence of parent aconitine in peripheral blood at 18 ng/mL with markedly higher cardiac concentration supports a recent, high-dose exposure; cardiac > peripheral is compatible with rapid centralization/post-mortem redistribution or very rapid, high-concentration exposure (see notes). Liver levels corroborate systemic exposure.

- **Aconitine metabolites (detected):** demethylated and hydroxylated metabolites identified in urine and liver (qualitative), supporting in vivo metabolism rather than external contamination.
- **Other plant alkaloids (screen for related/companion toxins):** negative (no detections of colchicine, strychnine, or ricin markers).
- **Heavy metals (ICP-MS panel):** arsenic, lead, mercury, cadmium — all below toxic thresholds and within expected background levels.

Quantitative/Interpretive summary

- **Primary toxicant detected:** aconitine (a plant-derived diterpenoid alkaloid commonly associated with Aconitum species). The concentration pattern (cardiac > peripheral blood; liver positive; urine metabolites present; negative hair) is most consistent with **an acute, recent exposure** rather than chronic ingestion.

- **Ethanol** present at **20 mg/dL (0.02 g/dL)** — unlikely to have significantly contributed to incapacitation; may have been consumed earlier but not at intoxicating levels.

- **No therapeutic or illicit drugs** of abuse detected at levels likely to cause incapacitation or death.

- **Mechanism of toxicity (interpretation):** aconitine exerts potent cardiotoxic and neurotoxic effects (sodium channel agonism), commonly leading to **ventricular arrhythmias, hypotension, paresthesias, and rapid cardiovascular collapse**. The presence of aconitine with the clinical scene (sudden collapse, lack of defensive wounds, small puncture behind ear) is strongly suggestive that **death was due to acute aconitine poisoning**, with a likely cardiac arrhythmic event as the immediate fatal mechanism.

- **Correlation with scene:** the tiny puncture wound behind the right ear + absence of ingestion evidence in stomach contents (no large bolus of plant material) supports **parenteral administration (e.g., injection)** as the route, consistent with the autopsy observation of a fine needle-type puncture. Trace-to-absent aconitine in urine and negative hair further support a recent single exposure rather than prolonged exposure.

Postmortem considerations & caveats

- **Postmortem redistribution (PMR):** some lipophilic toxins concentrate centrally after death; the higher cardiac concentration vs. femoral blood could reflect PMR but, given corroborating liver and metabolite data, this pattern supports ante-mortem high exposure and not solely PMR. Use femoral blood as more reliable for ante-mortem concentration.

- **Stability:** aconitine can be unstable; specimens were refrigerated/frozen per chain-of-custody. Recommend re-analysis if sterility chain is questioned.

- **Interferences:** no analytical interferences detected in confirmatory assays. Matrix suppression controls within acceptable limits.

Recommended confirmatory / ancillary testing

1. **Repeat LC-MS/MS quantitation on an independent extract** (to satisfy legal/chain-of-custody confirmation).

2. **Analysis of the crystalline residue under fingernails** (SEM-EDS and LC-MS) — to determine if residue contains plant particulates or synthetic adulterants; could link victim handling of dye samples.

3. **Forensic comparison of dye sample from the missing plant cabinet** (if recovered) versus liver/stomach residues by LC-MS and HPLC fingerprinting.

4. **Toxicokinetic modeling (case review)** to estimate probable time between exposure and collapse using measured blood/liver concentrations and known aconitine half-life data.

5. **Cardiac histology / conduction system exam** (if not yet performed) to seek evidence of acute ischemia or arrhythmic changes (but these may be non-specific).

6. **Finger/needle mark swabs** from the puncture site for DNA and trace analysis (to look for syringe lubricant or other handling residues).

The above raw toxicology report hasn't been written by me. The autopsy report is.