Figuring out what happened: A death in custody

Deland Weyrauch, MD

Deputy Medical Examiner

Montana State Medical Examiner's Office

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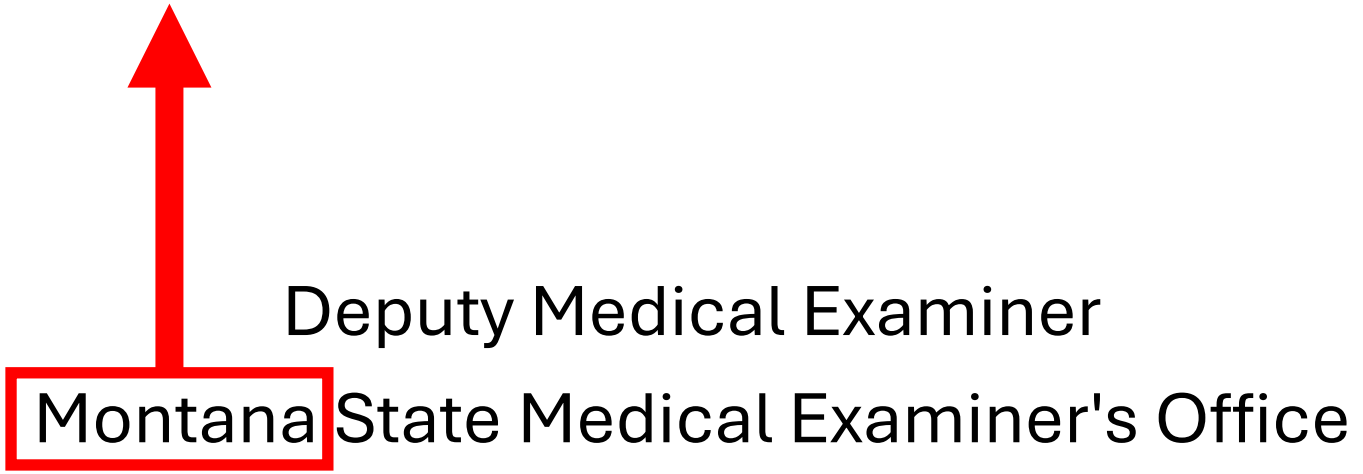
State medical examiner,

in a coroner system,

with mix of elected/appointed coroner and sheriff-coroner (law enforcement) counties



- 24-year-old man

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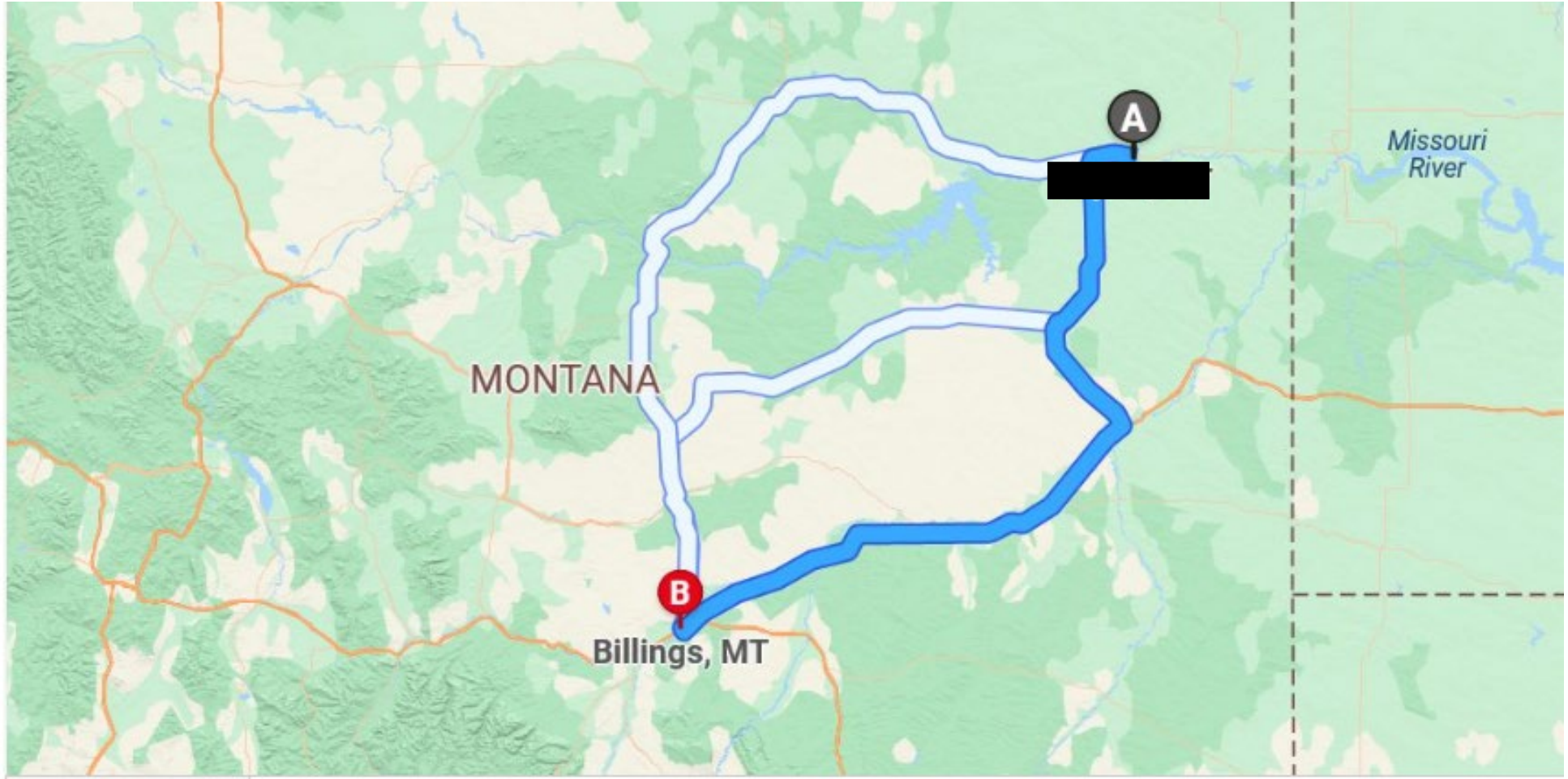
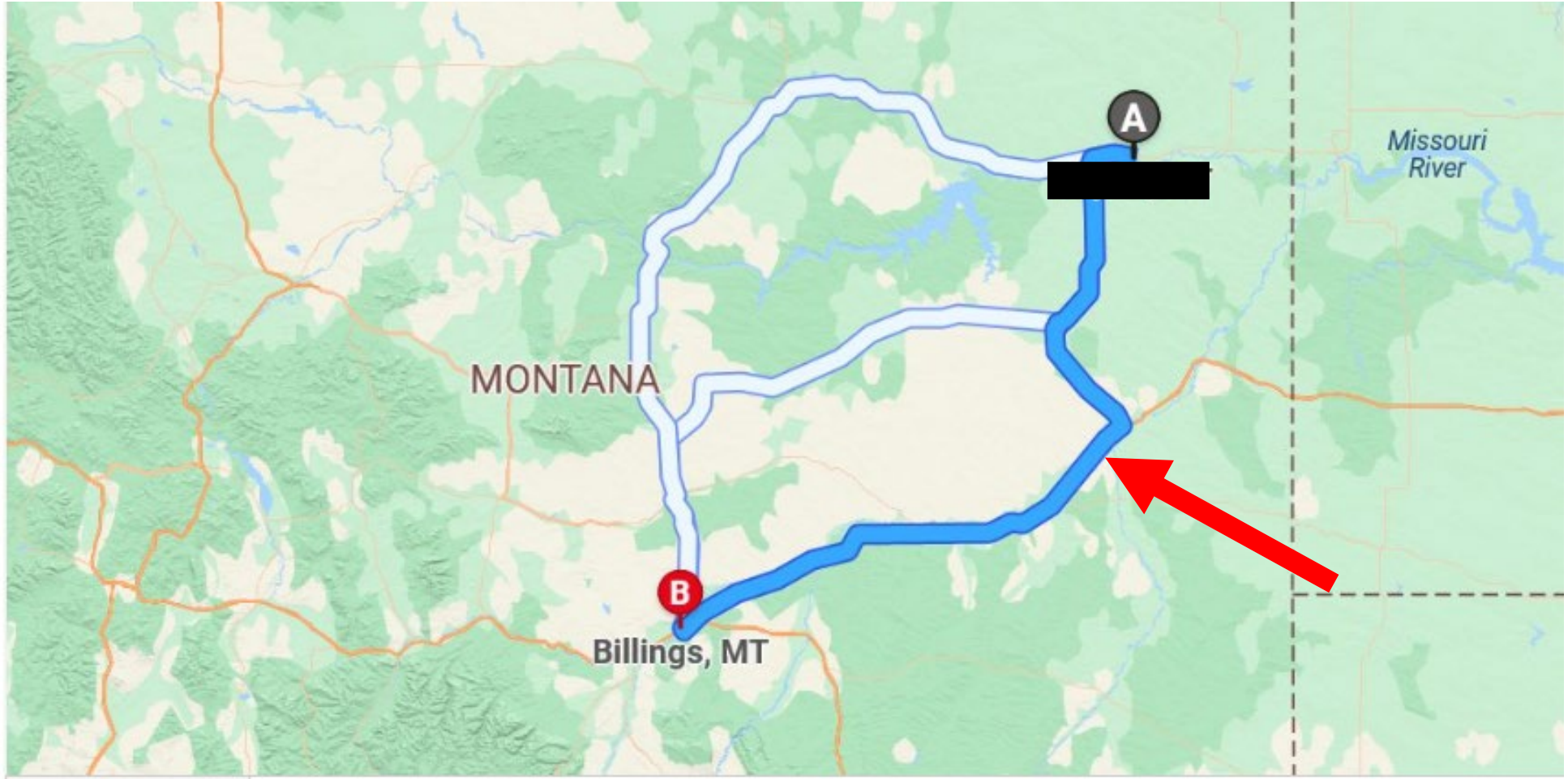
- In-custody death – Tribal prison

- 24-year-old man
- In-custody death – Tribal prison
- Staff found him unresponsive on the floor of his cell
  - seen in normal state of health about 20 minutes prior



4:22 hr min	307 miles **Light traffic** Via MT-13, I-94 W
4 hr 50 min	302 miles · Light traffic · Via MT-200
5 hr 23 min	346 miles · Light traffic · Via US-2 W, US-87 S



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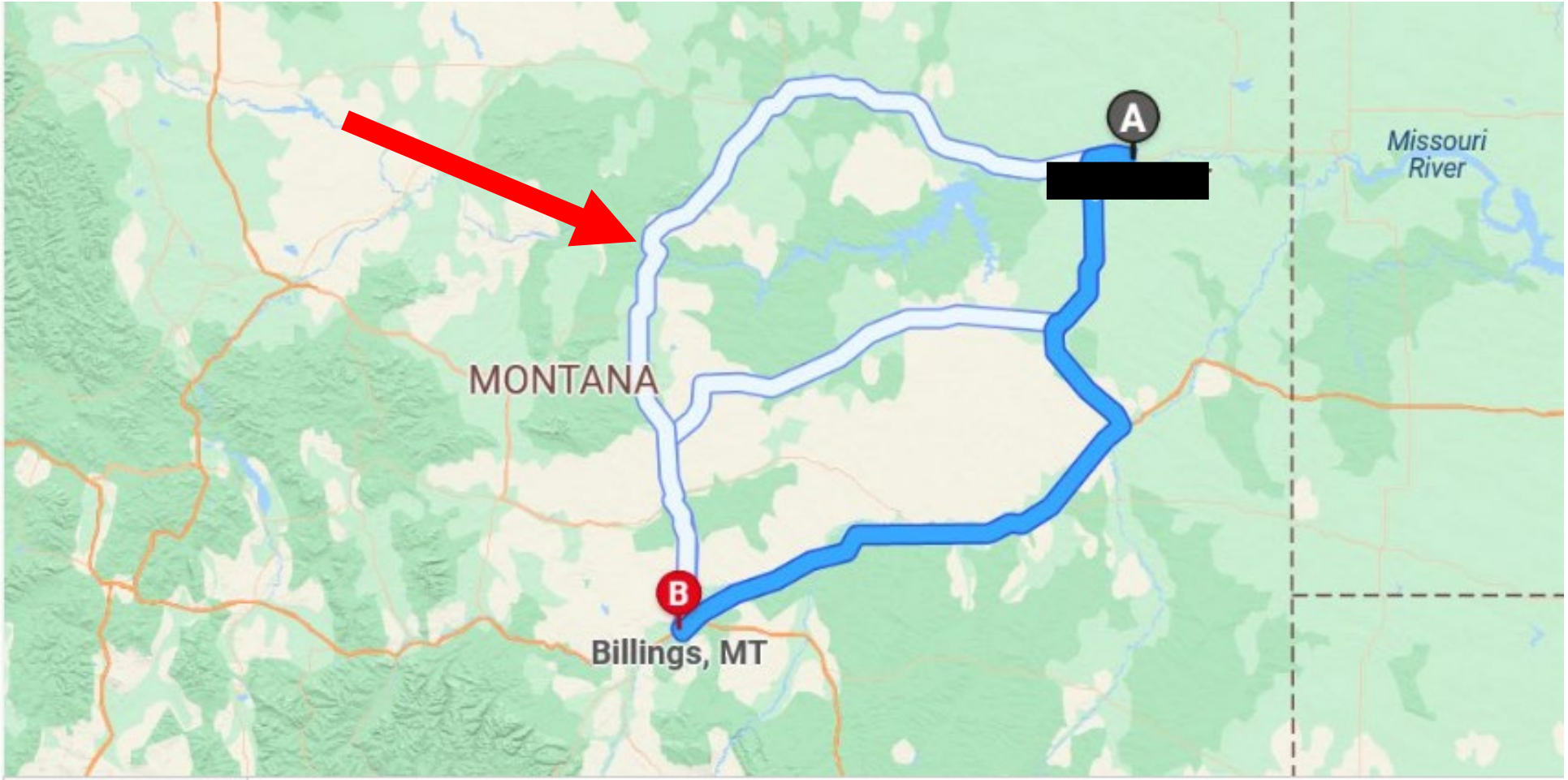

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  - Poison Control recommendations followed
  - Cleared after 6 hours of observation

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- Reportedly ingested over 100 pills the day of his refill for psychiatric medications

- ED evaluation:
  - Alert but drowsy
  - Poison Control recommendations followed
  - Cleared after 6 hours of observation

- Released to law enforcement, taken to tribal jail for suicide attempt


PLEASE
Label All
Bodies
WARNING

What happened?

What happened?

- Unexpected natural death?

What happened?

- Unexpected natural death?

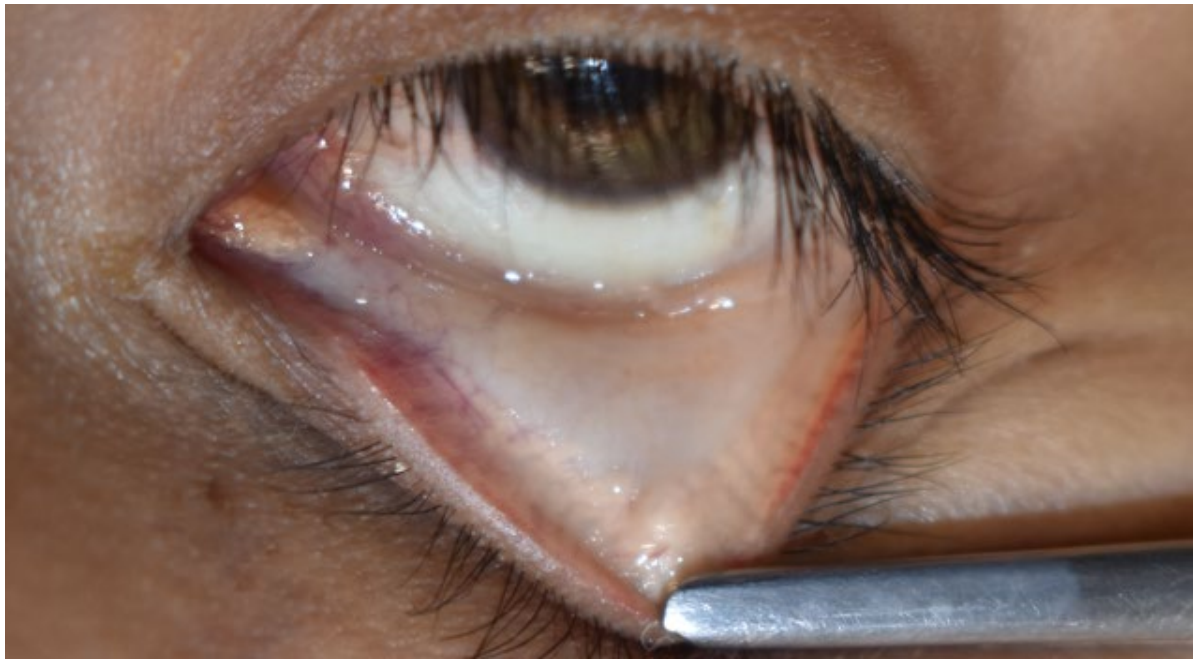
- Illicit drug trade/use in prison?

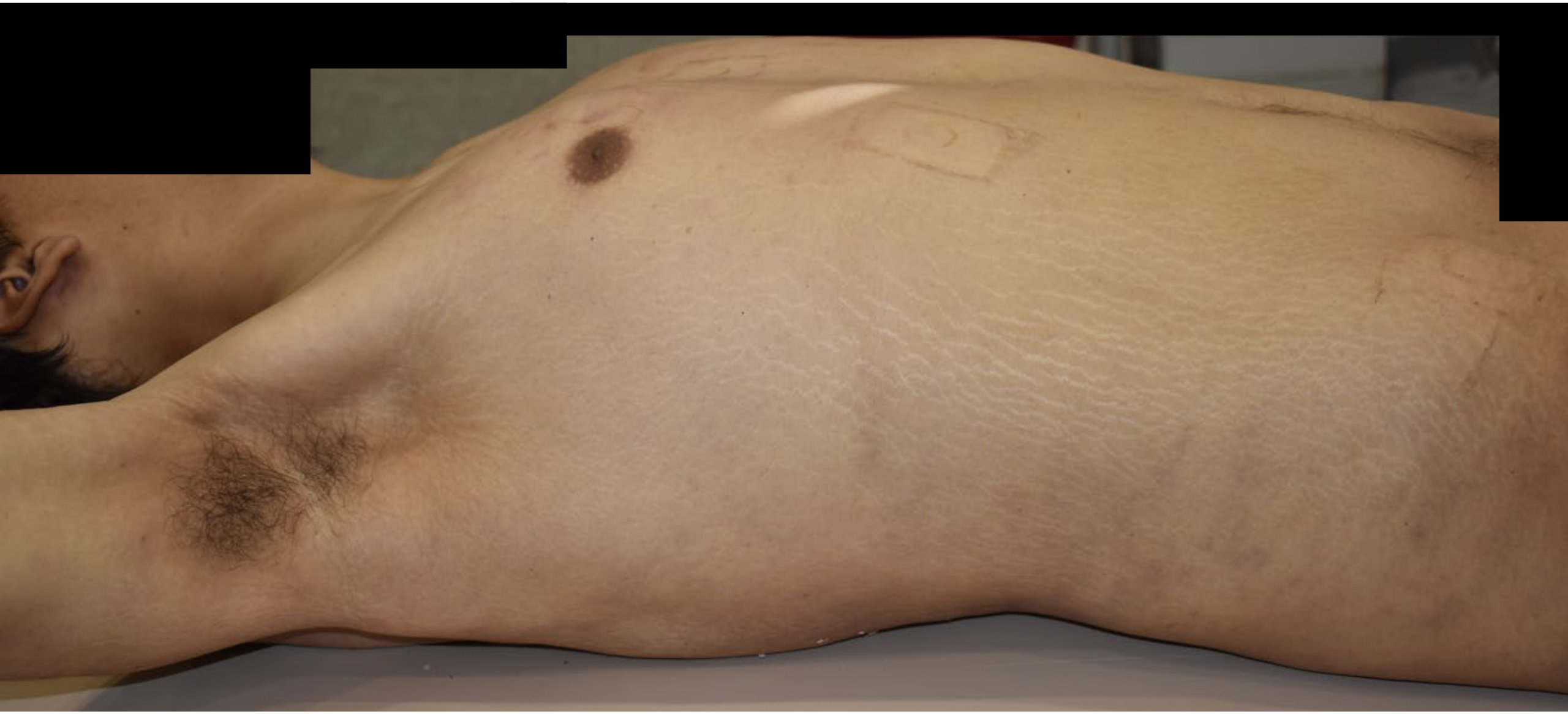
What happened?

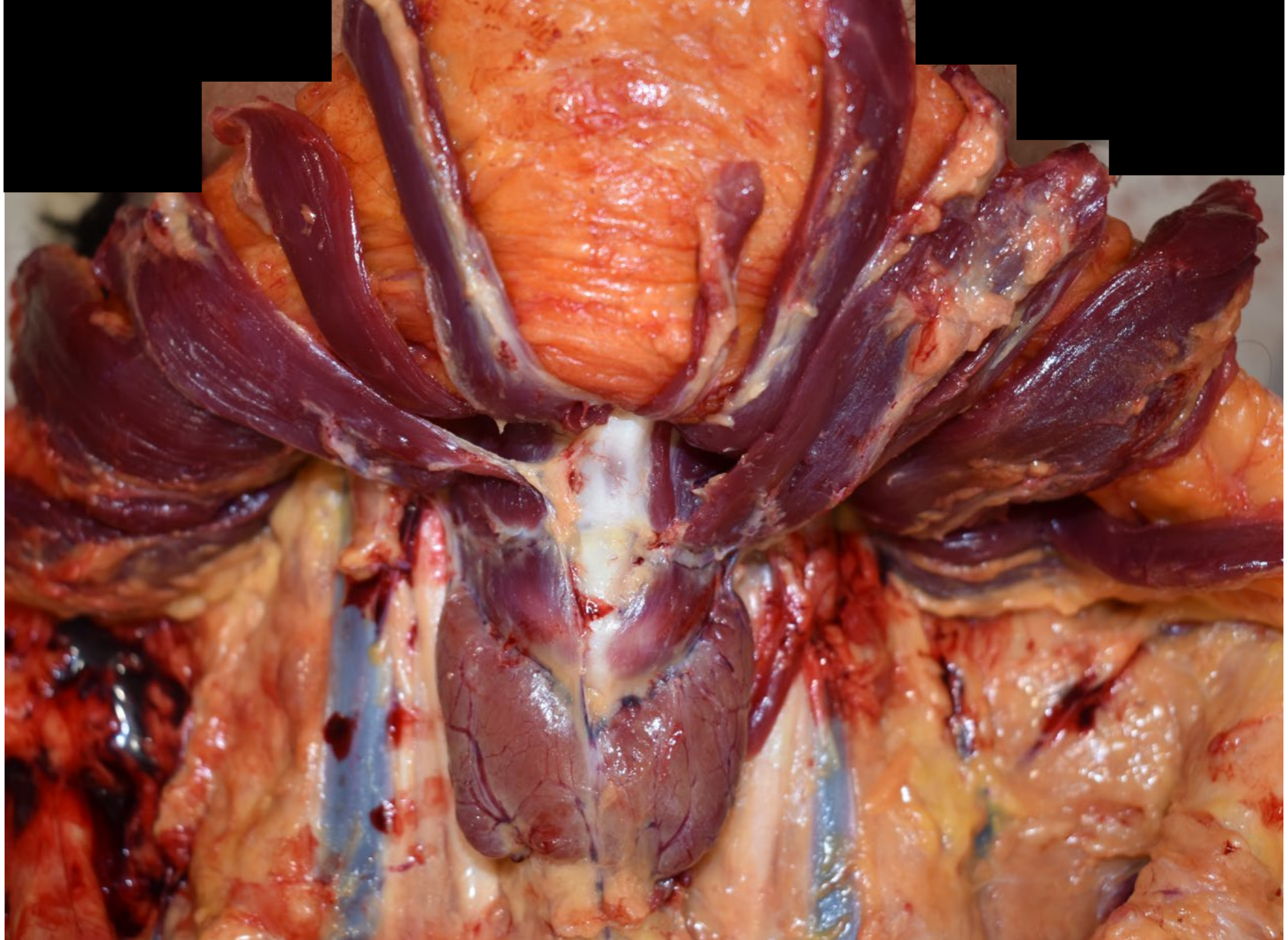
- Unexpected natural death?
- Illicit drug trade/use in prison?
- Self-harm?

What happened?

- Unexpected natural death?
- Illicit drug trade/use in prison?
- Self-harm?
- Injured by someone in the prison?







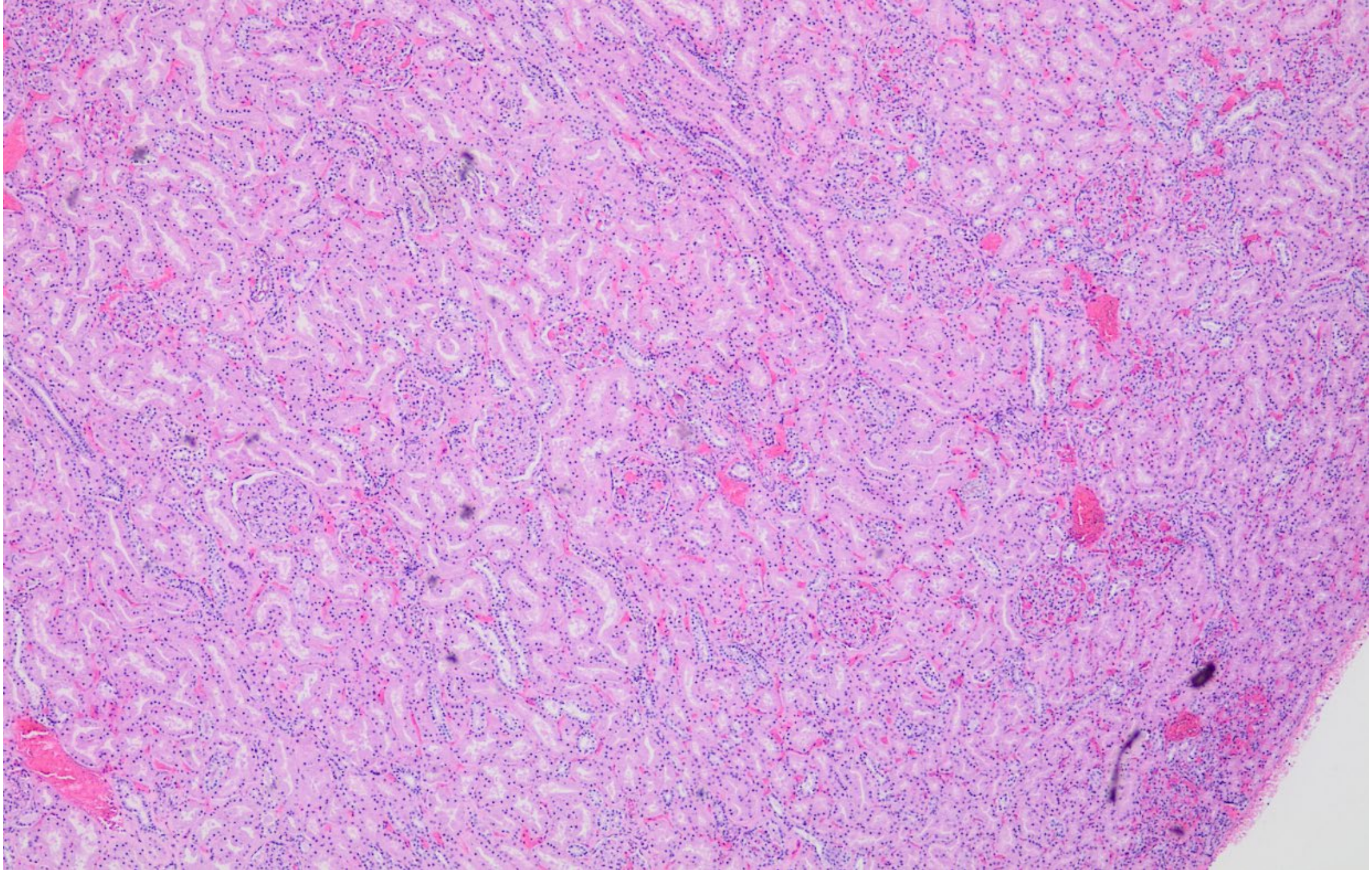
Back to the drawing board...

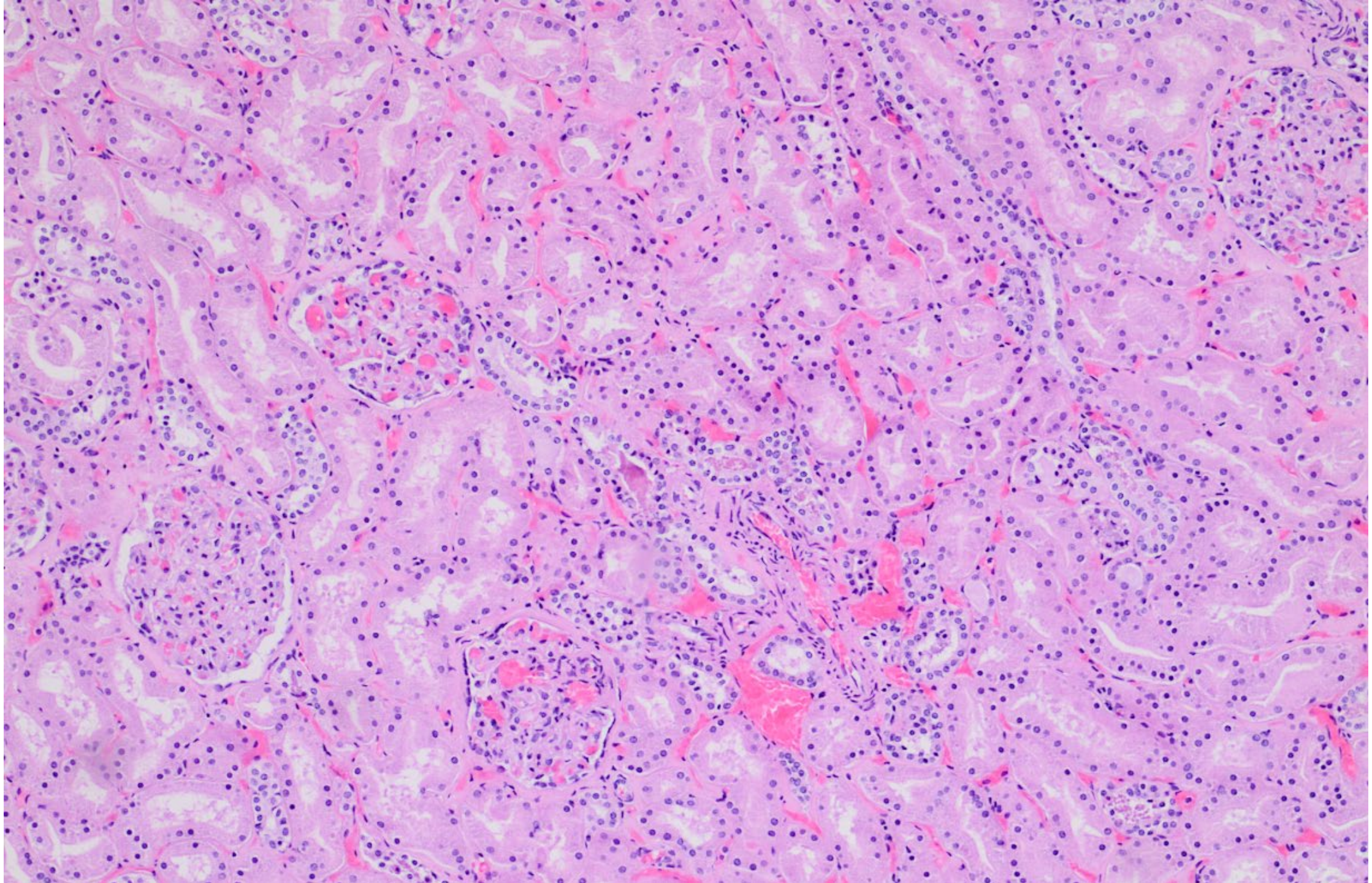
Back to the drawing board…

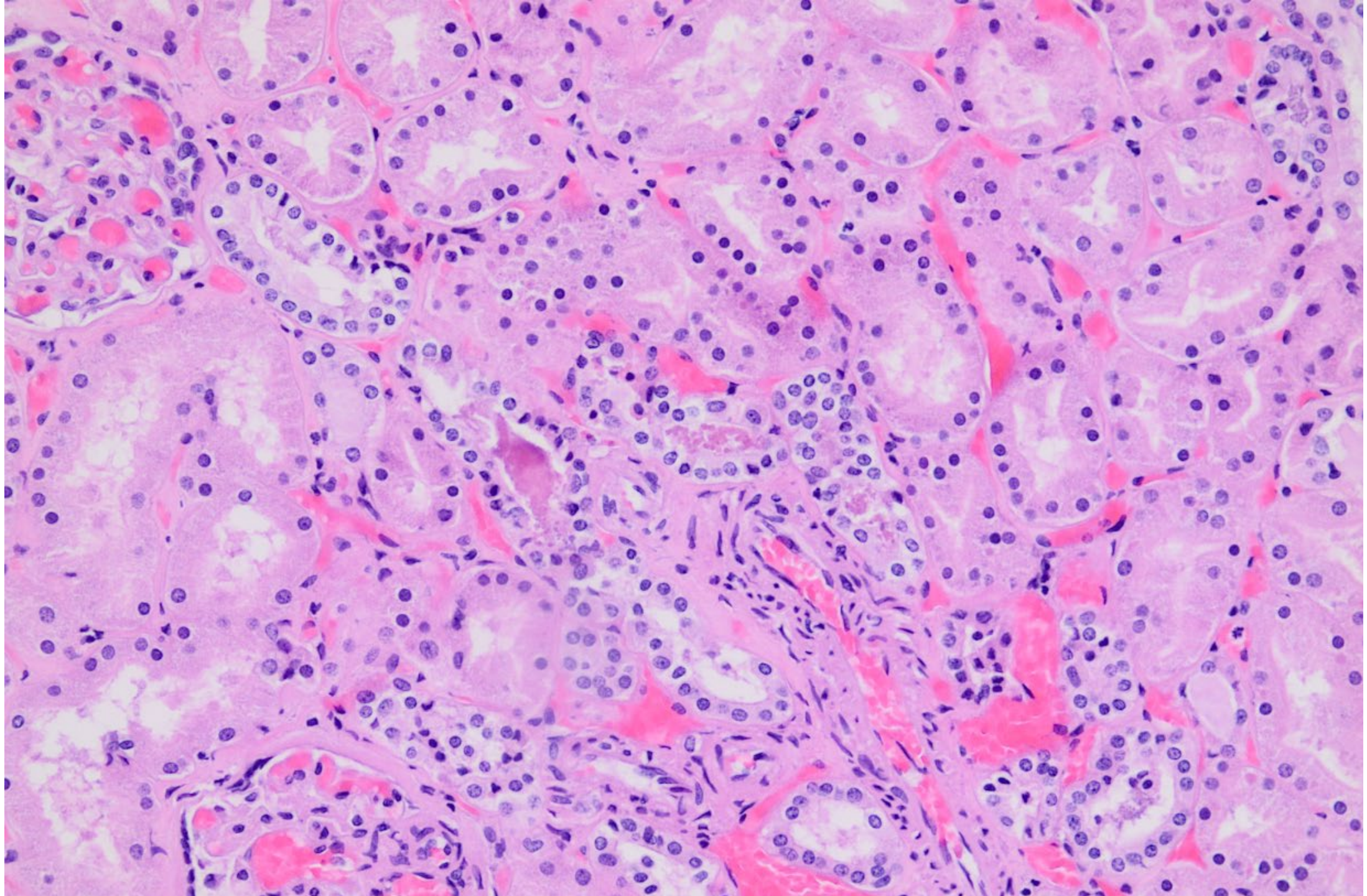
- What happened?

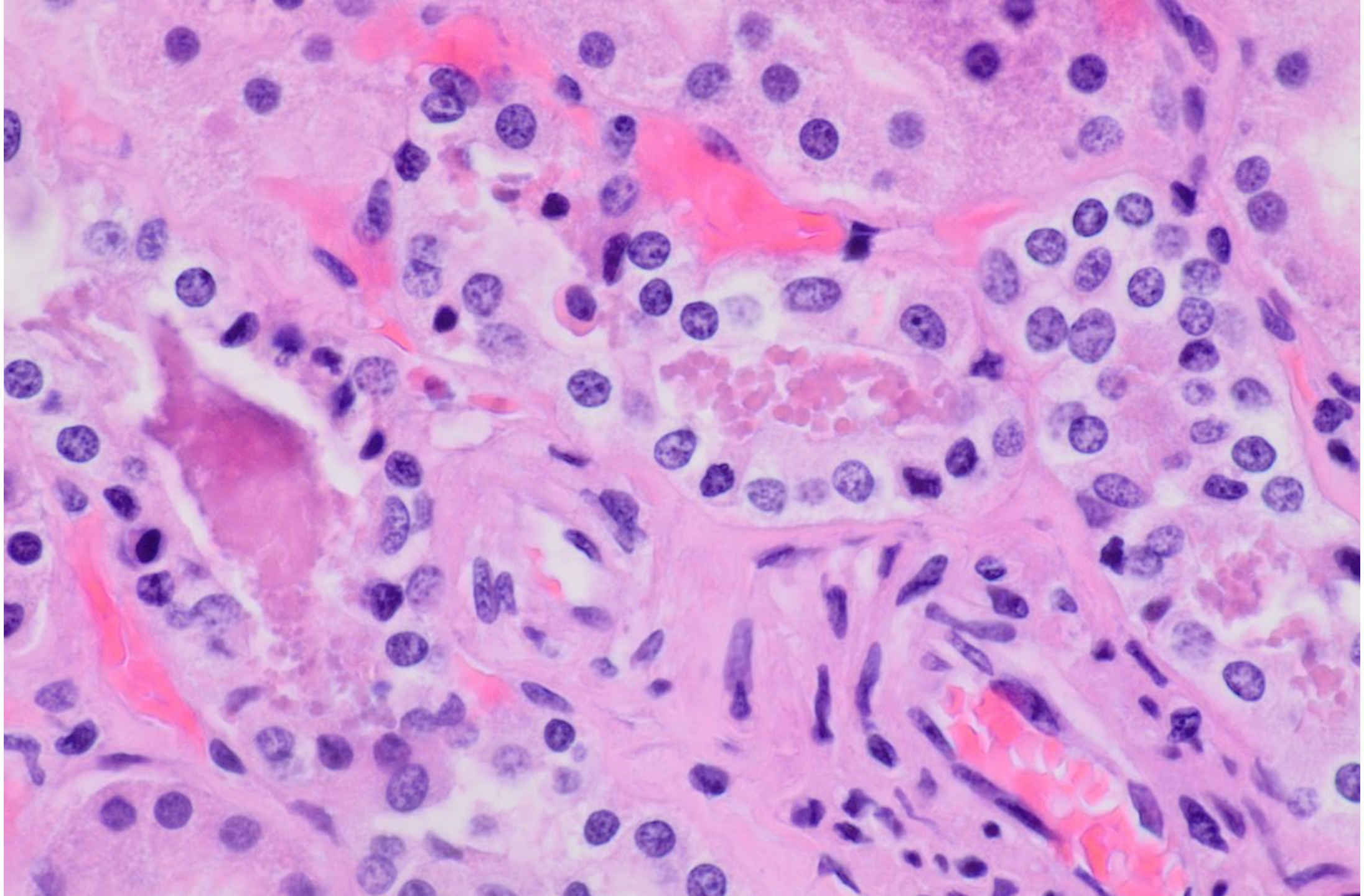
Back to the drawing board…

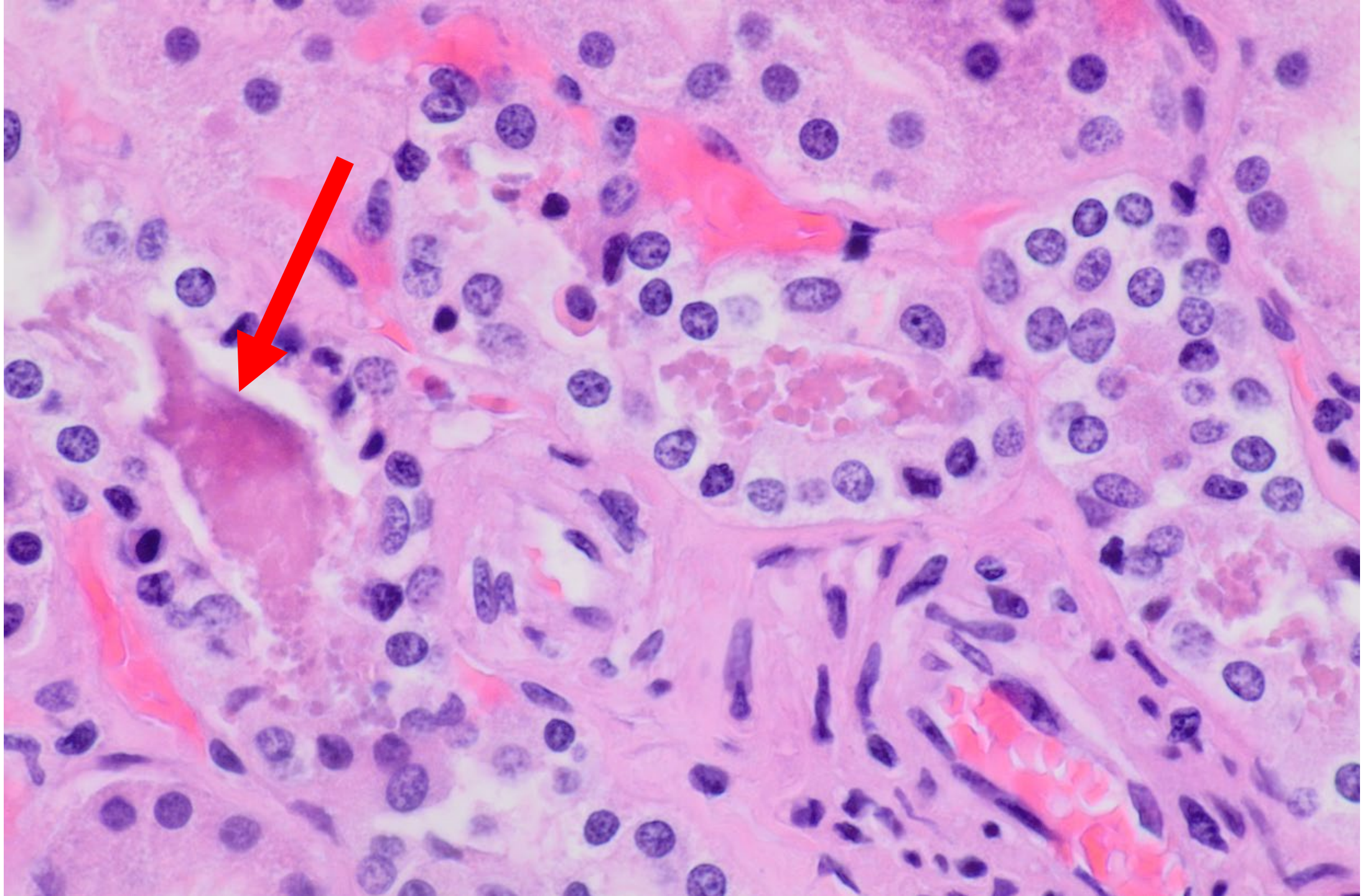
- What happened?
- Why is he dead?

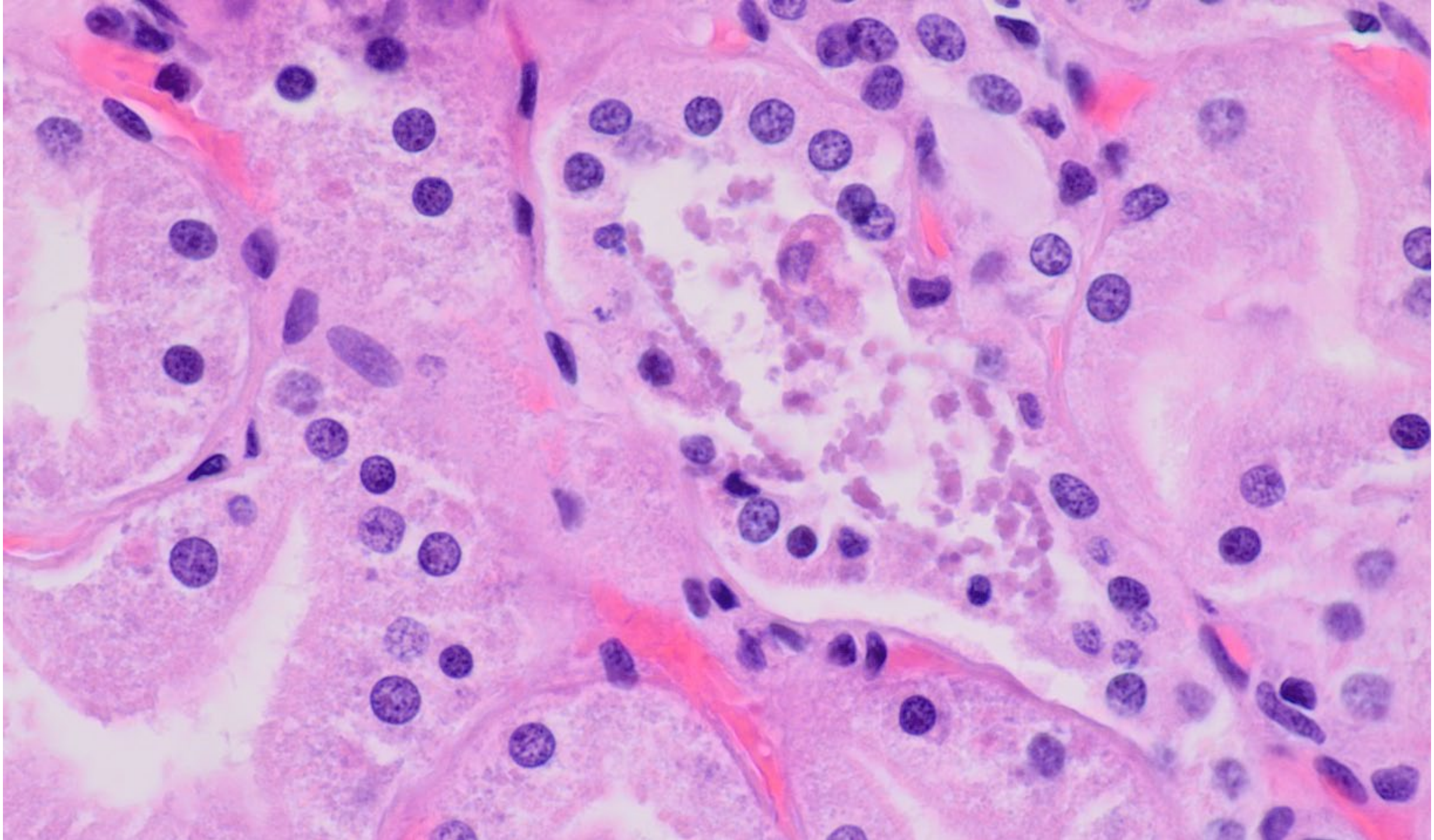


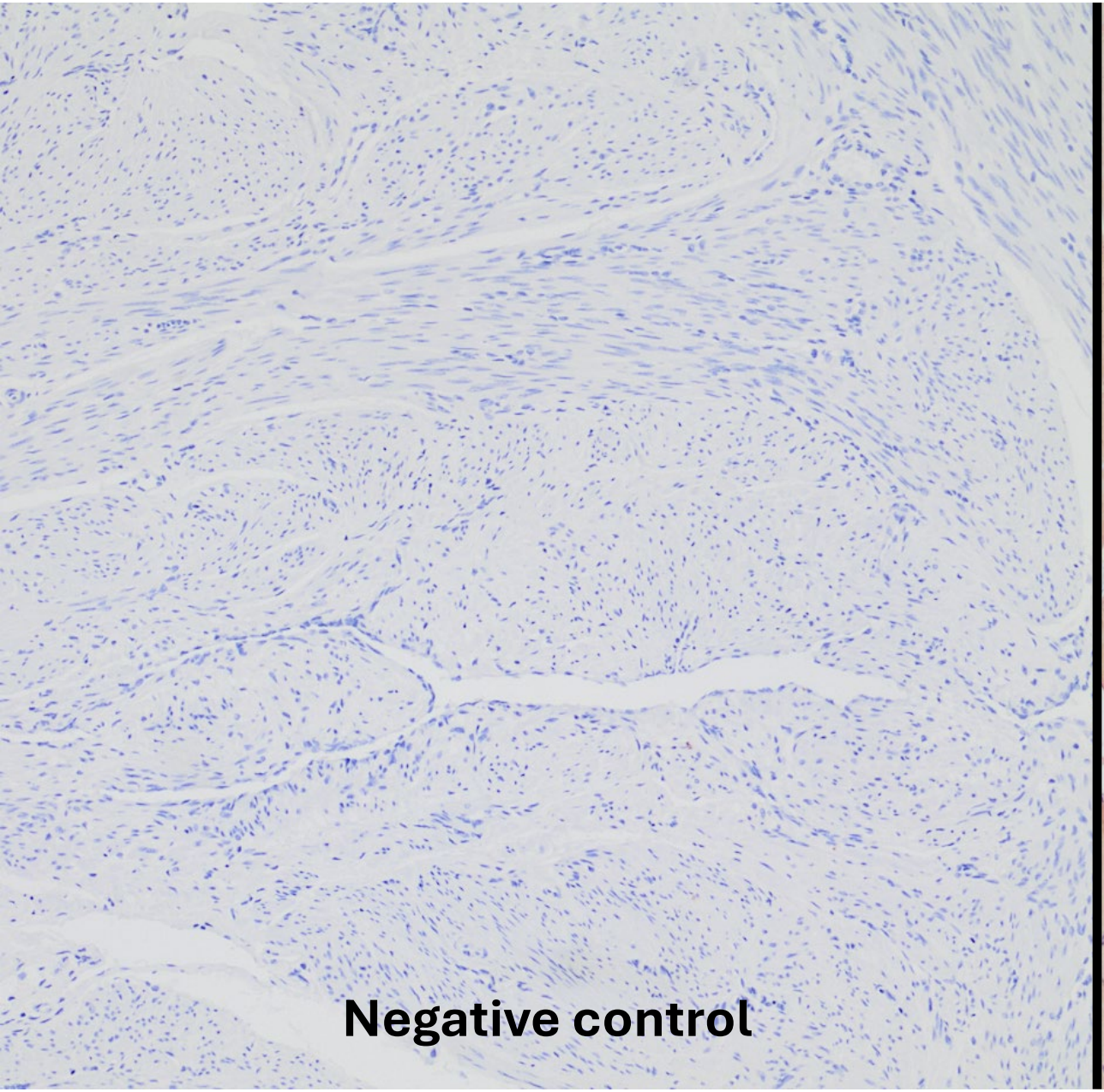


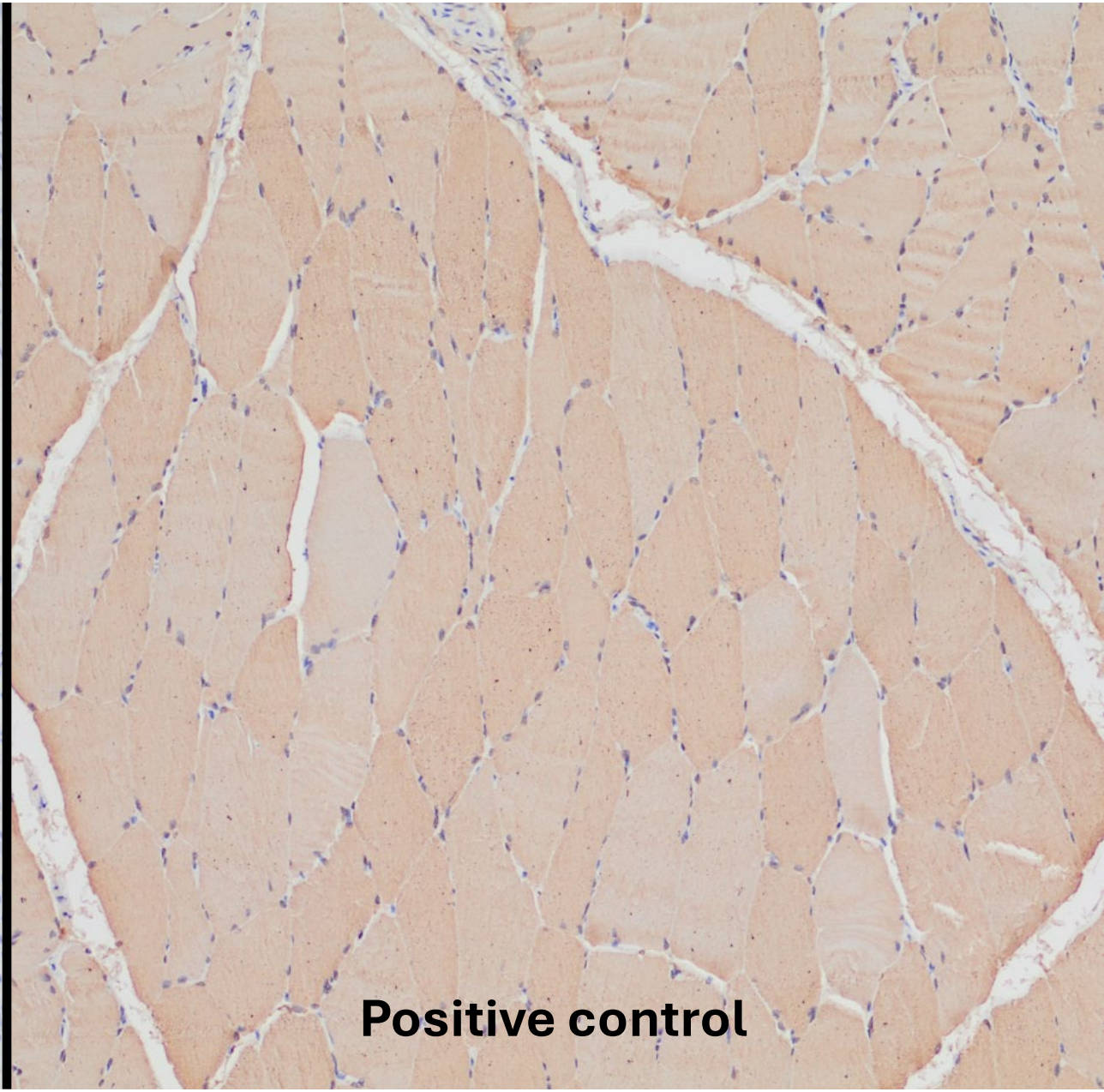




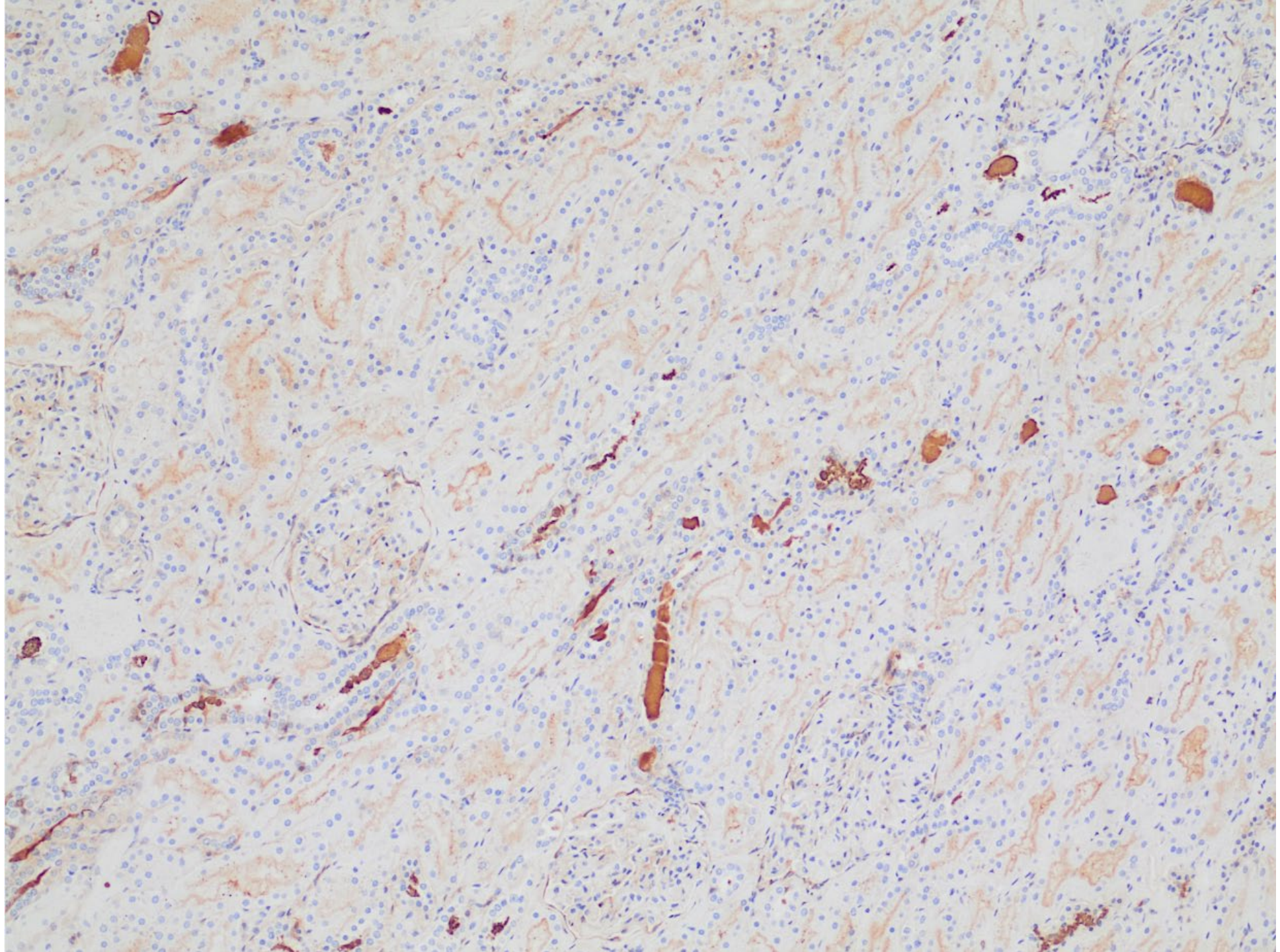


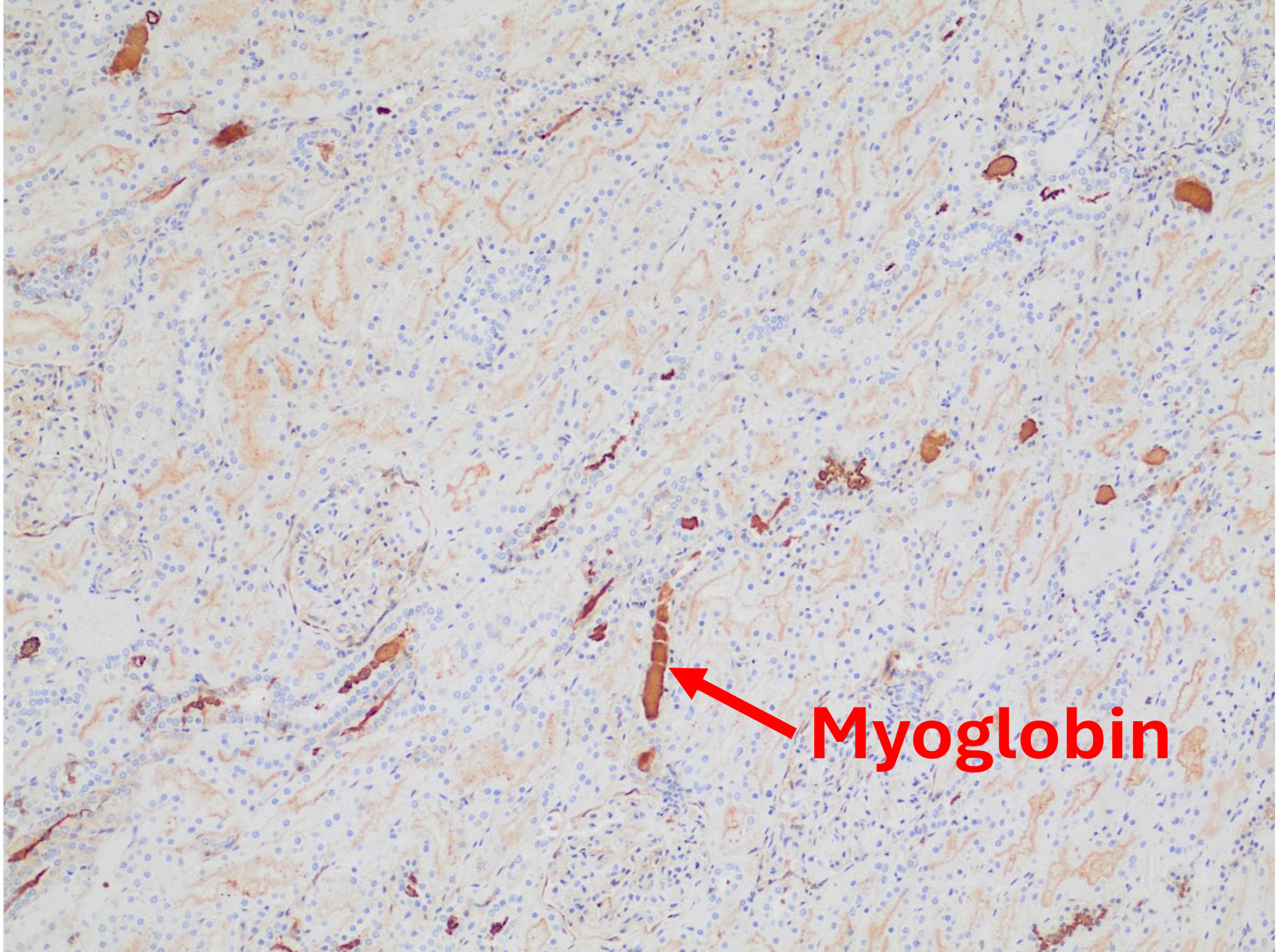






Myoglobin IHC

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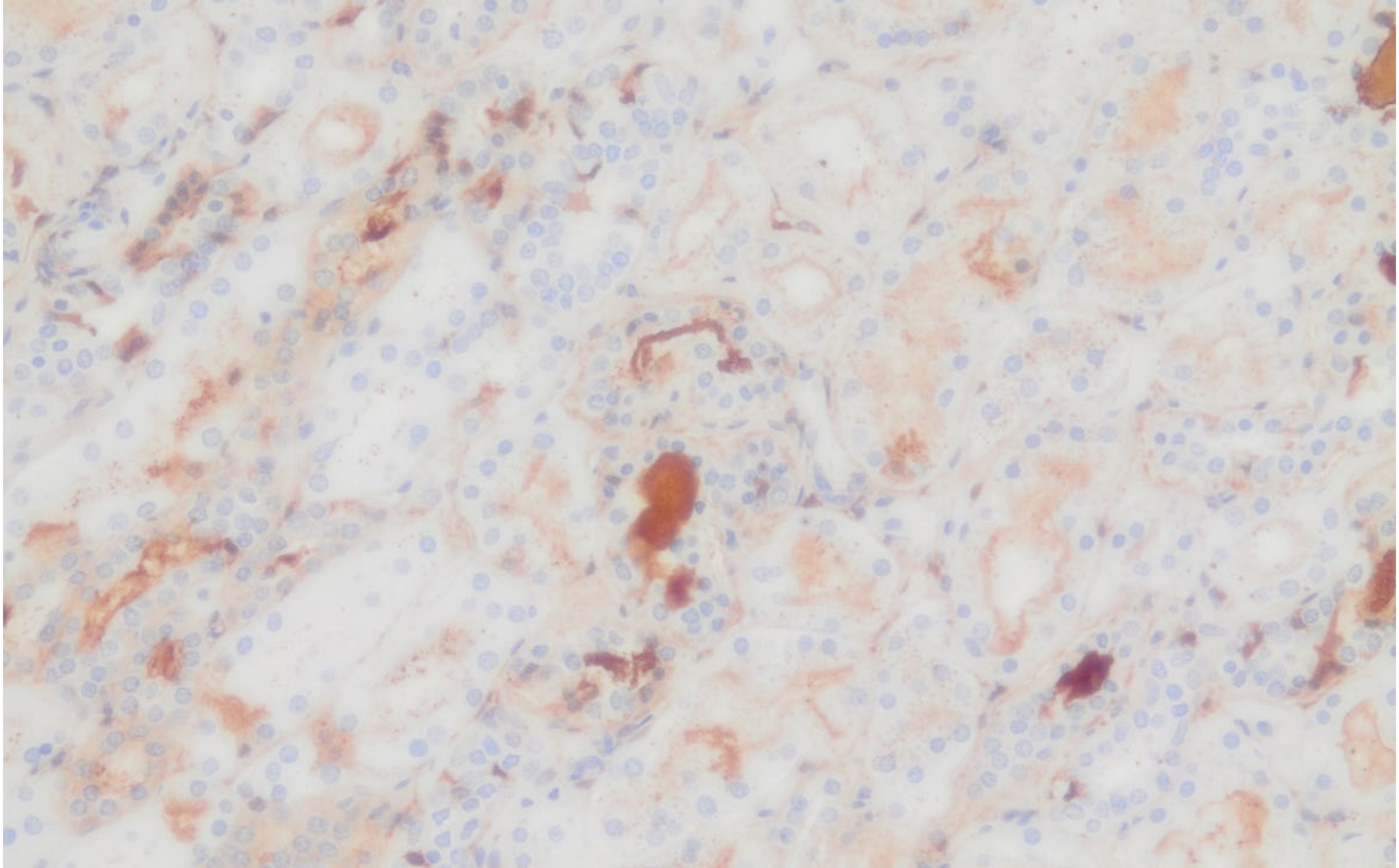
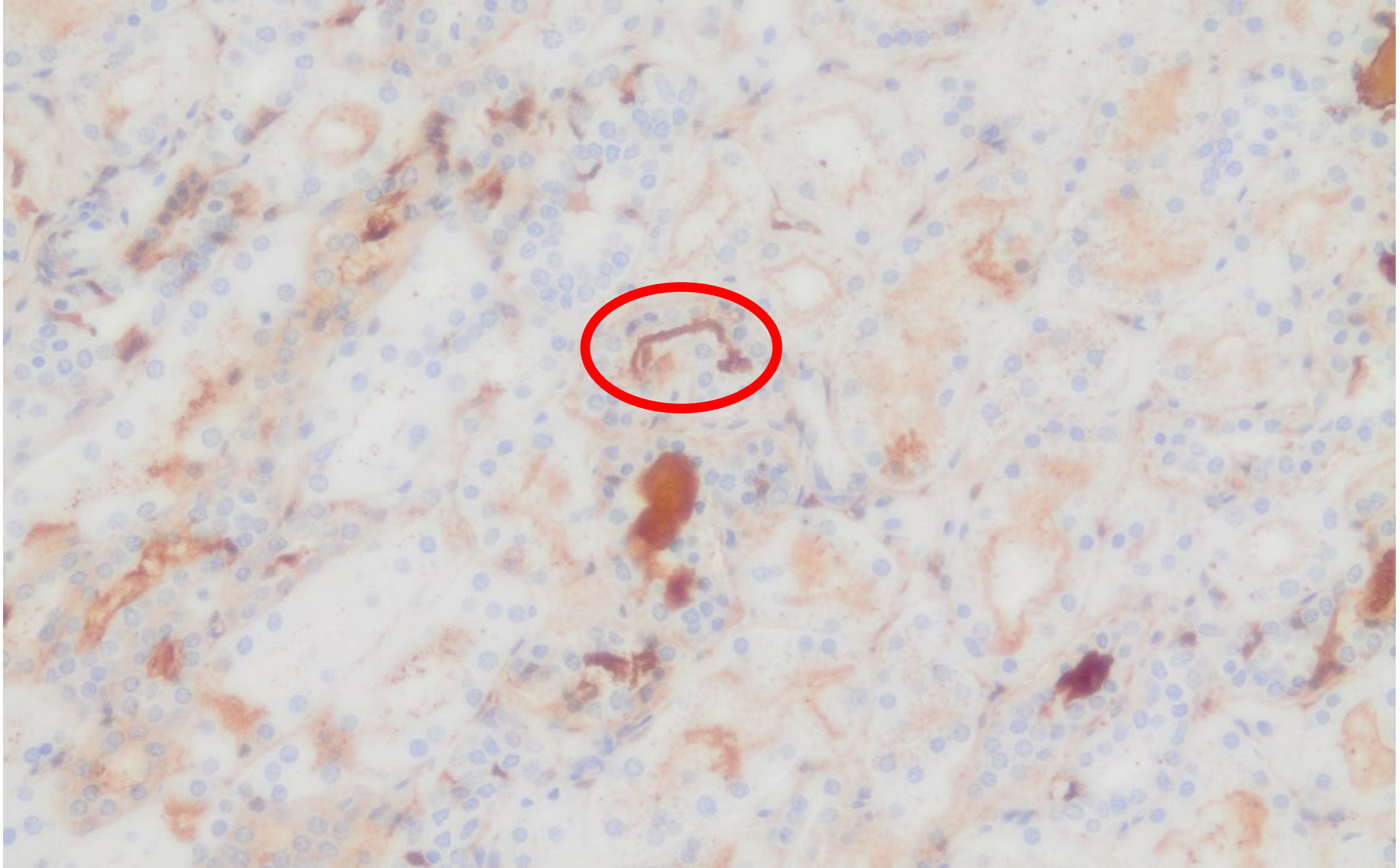
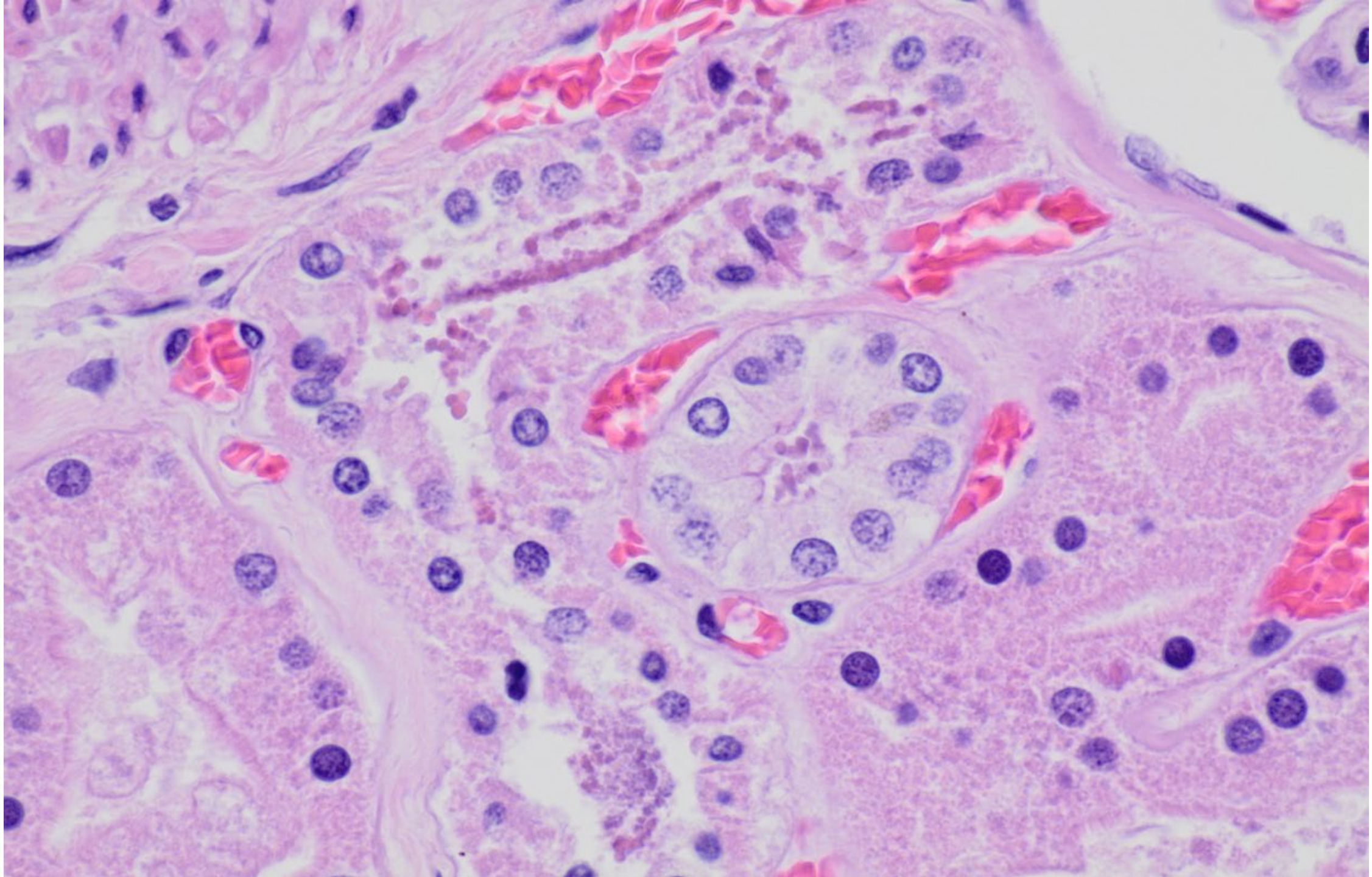
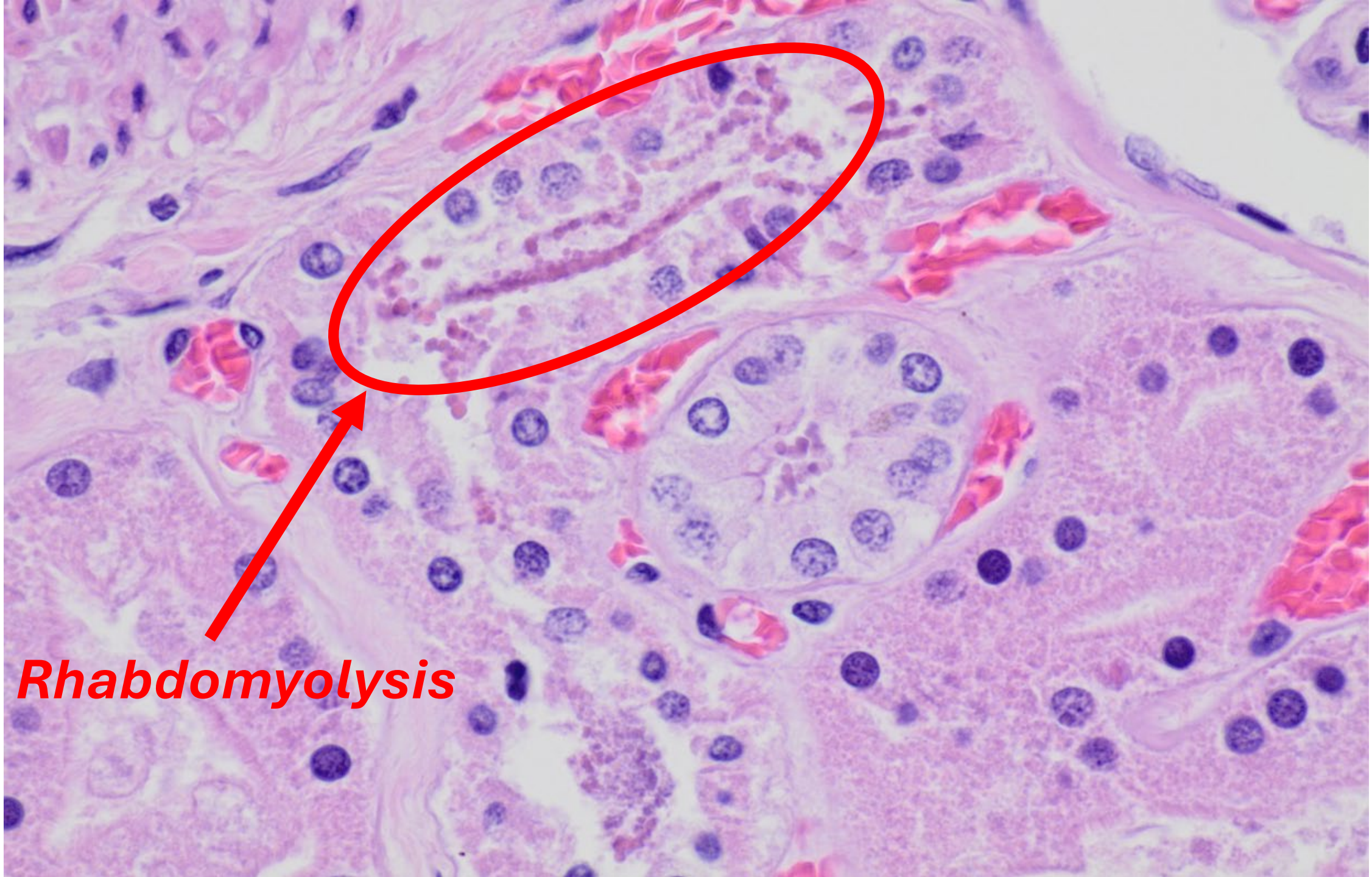
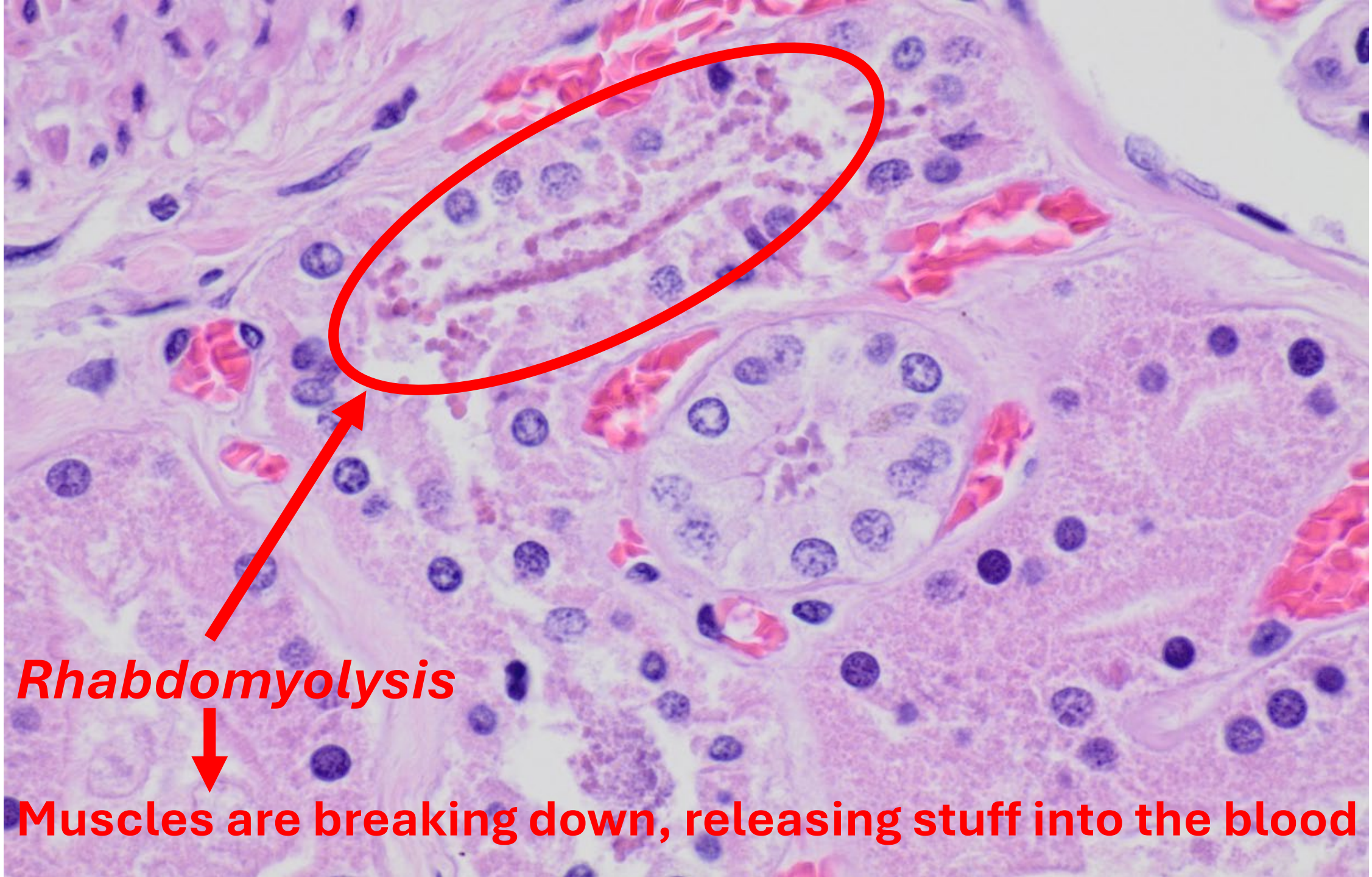







Rhabdomyolysis


Rhabdomyolysis
Muscles are breaking down, releasing stuff into the blood

UpToDate®

Rhabdomyolysis: Clinical manifestations and diagnosis

Outline

View in Language

AUTHORS: Salman Bhai, MD, Mazen M Dimachkie, MD

SECTION EDITORS: Ira N Targoff, MD, Jeremy M Shefner, MD, PhD

DEPUTY EDITOR: John F Dashe, MD, PhD

Contributor Disclosures

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: **Mar 2024.**

This topic last updated: **Dec 02, 2022.**

- Patients with a potential cause, triggering event, or increased risk of rhabdomyolysis (table 1), with or without myalgias or pigmenturia, as symptoms may be vague or absent in up to 50 percent of patients including those without a reliable medical history (eg, patients found down, or with coma, sedation, or delirium). (See "Rhabdomyolysis: Epidemiology and etiology", section on 'Classification'.)

Cardiac dysrhythmias — Cardiac dysrhythmias and risk of cardiac arrest may result from hyperkalemia and hypocalcemia associated with rhabdomyolysis [6,26].

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- But what happened?

CHEST Postgraduate Education Corner
CONTEMPORARY REVIEWS IN CRITICAL CARE MEDICINE

Rhabdomyolysis

Janice L. Zimmerman, MD, FCCP; and Michael C. Shen, MD

Rhabdomyolysis is a well-known clinical syndrome of muscle injury associated with myoglobinuria, electrolyte abnormalities, and often acute kidney injury (AKI). The pathophysiology involves injury to the myocyte membrane and/or altered energy production that results in increased intracellular calcium concentrations and initiation of destructive processes. Myoglobin has been identified as the primary muscle constituent contributing to renal damage in rhabdomyolysis. Although rhabdomyolysis was first described with crush injuries and trauma, more common causes in hospitalized patients at present include prescription and over-the-counter medications, alcohol, and illicit drugs. The diagnosis is confirmed by elevated creatine kinase levels, but additional testing is needed to evaluate for potential causes, electrolyte abnormalities, and AKI. Treatment is aimed at discontinuation of further skeletal muscle damage, prevention of acute renal failure, and rapid identification of potentially life-threatening complications. Review of existing published data reveals a lack of high-quality evidence to support many interventions that are often recommended for treating rhabdomyolysis. Early and aggressive fluid resuscitation to restore renal perfusion and increase urine flow is agreed on as the main intervention for preventing and treating AKI.

Table 1—*Causes of Rhabdomyolysis*

Hypoxic	Physical	Chemical	Biologic
External	External	External	External
Carbon monoxide exposure	Crush injury	Alcohol	Bacterial, viral, and parasitic myositis
Cyanide exposure	Trauma	Prescription medications	Organic toxins
Internal	Burns	Over-the-counter medications	Snake venom
Compartment syndrome	Electrocution	Illicit drugs	Spider bites
Vascular compression	Hypothermia	Internal	Insect stings (ants, bees, wasps)
Immobilization	Hyperthermia (heat stroke)	Hypokalemia	Internal
Bariatric surgery	Internal	Hypophosphatemia	Dermatomyositis, polymyositis
Prolonged surgery	Prolonged and/or extreme exertion	Hypocalcemia	Endocrinopathies
Sickle cell trait	Seizures	Hypo-/hypernatremia	Adrenal insufficiency
Vascular thrombosis	Status asthmaticus		Hypothyroidism
Vasculitis	Severe agitation (delirium tremens, psychosis)		Hyperaldosteronism
	Neuroleptic malignant syndrome		Diabetic ketoacidosis
	Malignant hyperthermia		Hyperosmolar state

Zimmerman JL, Shen MC. Chest. 2013.

such as seizures or status asthmaticus.[27]

Chemical causes now account for most cases of rhabdomyolysis.[3,4] This category includes prescription and over-the-counter medications, illicit drugs, inorganic toxins, and electrolyte abnormalities. Table 2 lists selected drugs implicated as a cause of rhabdomyolysis. Psychiatric medications (eg, quetiapine, aripiprazole) rank as one of the most frequent precipitants, with a portion related to neuroleptic malignant syndrome.[4] Statins are also implicated frequently. Fewer than 1% of those taking statins alone will

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Table 2—*Selected Drugs Associated With Rhabdomyolysis*

Drugs
Medications
Lipid-lowering agents
Statins
Fibrates
Psychiatric medications
Neuroleptics/antipsychotics (including haloperidol, atypical antipsychotics)
Selective serotonin reuptake inhibitors
Lithium
Valproic acid
Antimicrobial agents
Antiretroviral medications (protease inhibitors)

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Chief Complaint

Pt presents to ED with c/o possible overdose of multiple medications

History of Present Illness

24-year-old male brought in by EMS secondary to overdose. Per family patient's medications were refilled today and patient took all 4 bottles of pills and ingested them. olanzapine 5 mg -21 tablets, olanzapine 10 mg- 42 tablets, Haldol 5 mg- 84 tablets, Docusate 100 mg- 42 tablets. Patient has underlying history of schizophrenia. He is currently alert and oriented x 2 but drowsy. He is able level in 4 hours., QTc of 456. Poison control was notified at 1608. They do not recommend charcoal due to his somnolence and concern for aspiration. They recommend monitoring for minimum of 6 hours continuous watch for QTc greater than 500. If so administer 1 to 2 g of magnesium. Repeat Tylenol and salicylate level in 4 hours. GCS 13

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84 tablets haloperidol, 63 tablets olanzapine (atypical antipsychotic)

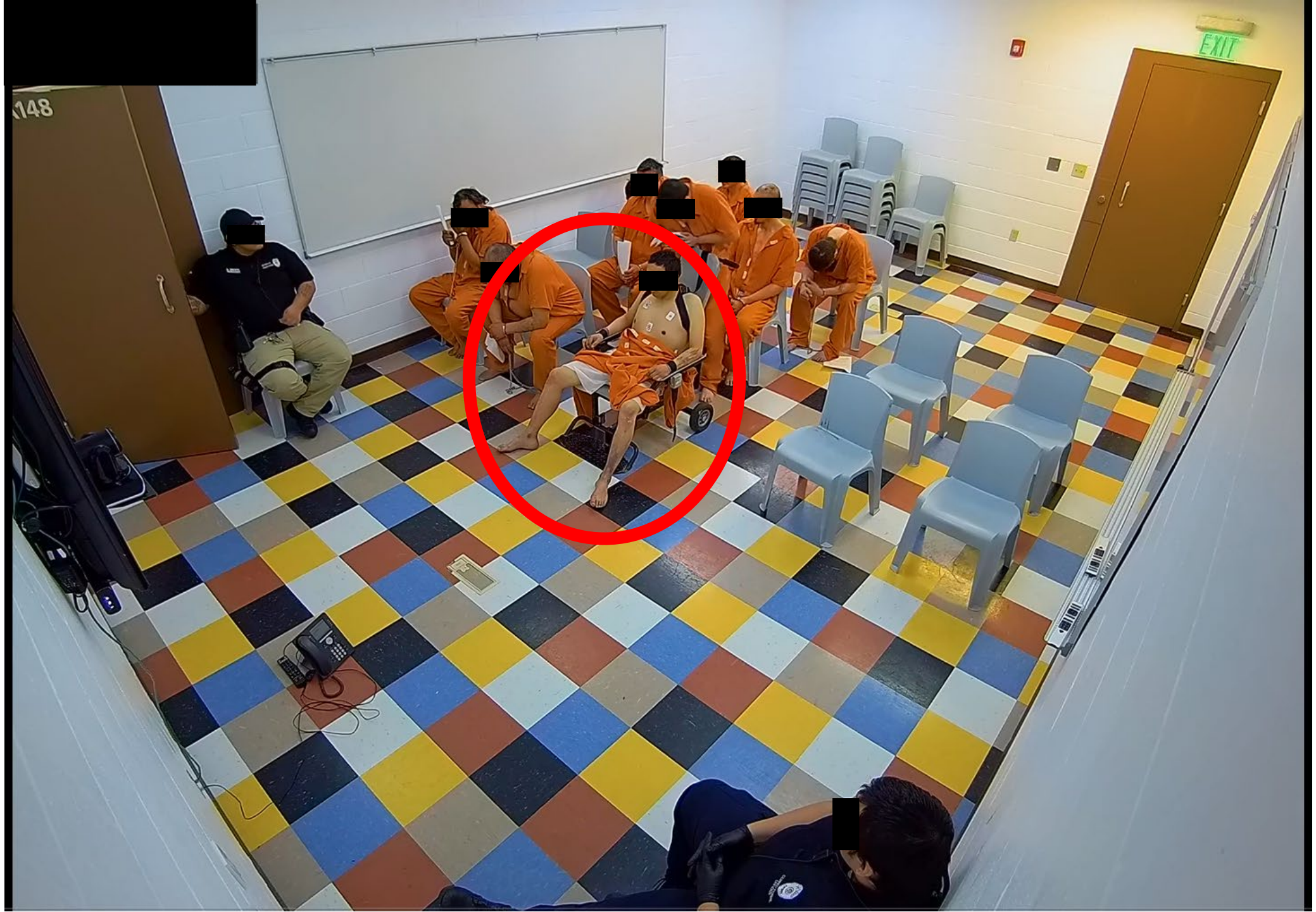
History and examination — The history should focus on factors that may cause or predispose to rhabdomyolysis, including traumatic, nontraumatic exertional, and nontraumatic nonexertional etiologies [31]. These include (see "Rhabdomyolysis: Epidemiology and etiology"):

- Recent trauma
- Prescription medications with attention to myotoxic agents
- Alcohol and/or substance abuse
- Prolonged immobilization
- Preceding surgery
- Infection or sepsis
- Strenuous or unaccustomed physical exertion or exercise
- Heat exposure or hyperthermia of any cause
- History of myopathy or muscular dystrophy
- History of exercise intolerance
- Prior episodes of rhabdomyolysis
- Electrocution
- Burn injury
- Physical restraint
- Convulsive seizure
- Toxin exposure
- Endocrine disease


1109
1114
EYE WASH STATION
FIRE EXTINGUISHER


1109
1114
EYE WASH STATION


148
EXIT


148
EXIT


1109
1114
EYE WASH STATION
FIRE EXTINGUISHER

Toxicology

- Blood
  - Olanzapine 550 ng/mL
  - Haloperidol 19 ng/mL

- Urine
  - Olanzapine
  - Haloperidol
  - Methamphetamine
  - Amphetamine

Per case manager at prison (via phone call):

- No administered medication in prison in days leading up to death

Manner?

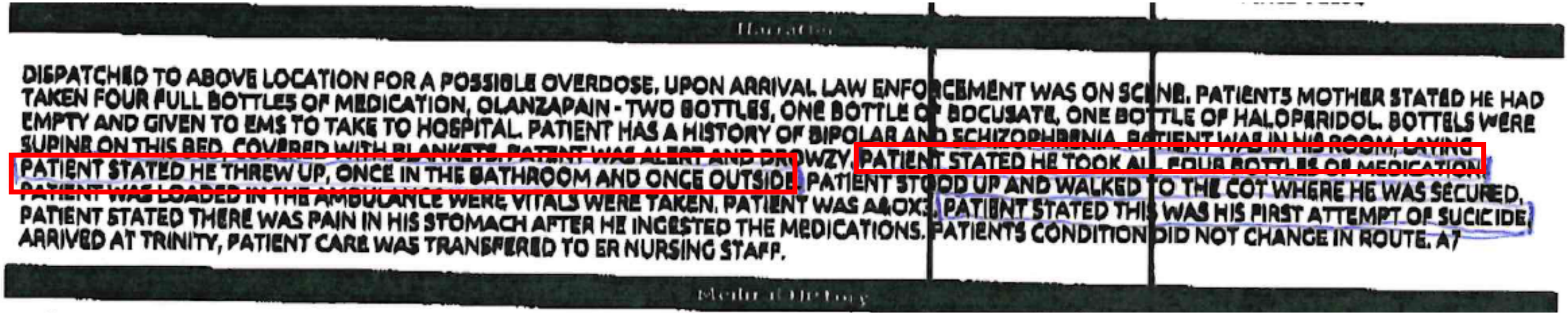
- No known previous suicide attempt or ideation

- Psychiatric diagnosis of schizophrenia?

EMS run report

DISPATCHED TO ABOVE LOCATION FOR A POSSIBLE OVERDOSE. UPON ARRIVAL LAW ENFORCEMENT WAS ON SCENE. PATIENTS MOTHER STATED HE HAD TAKEN FOUR FULL BOTTLES OF MEDICATION, OLANZAPAIN - TWO BOTTLES, ONE BOTTLE OF BOCUSATE, ONE BOTTLE OF HALOPERIDOL. BOTTELS WERE EMPTY AND GIVEN TO EMS TO TAKE TO HOSPITAL. PATIENT HAS A HISTORY OF BIPOLAR AND SCHIZOPHRENIA. PATIENT WAS IN HIS ROOM, LAYING SUPINE ON THIS BED, COVERED WITH BLANKETS. PATENT WAS ALERT AND DROWZY. PATIENT STATED HE TOOK ALL FOUR BOTTLES OF MEDICATION; PATIENT STATED HE THREW UP, ONCE IN THE BATHROOM AND ONCE OUTSIDE. PATIENT STOOD UP AND WALKED TO THE COT WHERE HE WAS SECURED, PATIENT WAS LOADED IN THE AMBULANCE WERE VITALS WERE TAKEN. PATIENT WAS A&OX3. PATIENT STATED THIS WAS HIS FIRST ATTEMPT OF SUCICIDE; PATIENT STATED THERE WAS PAIN IN HIS STOMACH AFTER HE INGESTED THE MEDICATIONS. PATIENTS CONDITION DID NOT CHANGE IN ROUTE. AT ARRIVED AT TRINITY, PATIENT CARE WAS TRANSFERED TO ER NURSING STAFF.

EMS run report



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CAUSE OF DEATH:

Complications including Rhabdomyolysis due to Recent Olanzapine, Haloperidol, and Methamphetamine Intoxication

MANNER OF DEATH:

Suicide (Ingested Medication)

Circumstantial

- Coroner's report of investigation
- Primary police reports
- FBI interviews
- Prison video of decedent
- Phone conversation with prison staff
- Attempts to reach decedent's family/witness for information
- Emergency medical services report
- Medical records from 5 different facilities covering several years

Autopsy

- Extensive/detailed documentation
- Special anatomic dissections
- Two rounds of histology submissions
- Additional round of immunohistochemical histology
- Medical literature review

State of Montana
Coroner Liaison

Trained, accredited (ABMDI) medicolegal death investigator

Bridge between the Medical Examiners and County Coroners

Facilitates optimal death investigation practices

Kayla Wallace

State of Montana
Coroner Liaison

- Consultation with coroners
- Coroner training and education
- Monitor ongoing issues
- "Catch" cases that should be under ME/C jurisdiction
- Facilitate use of electronic case management systems
- Work with public health

Kayla Wallace

[redacted]

National Center on Forensics

A Program of the National Institute of Justice

Creating a Coroner Liaison Position

The State of Montana Forensic Science Division identified challenges in their death investigation structure. The concept of an experienced death investigator liaison position was devised to bridge a resource gap and provide on-the-ground consultation, training, and support for the state's independent coroner system. The Forensic Science Division partnered with the National Center on Forensics, supported by a grant from the National Institute of Justice, along with George Mason University, the American Society of Clinical Pathologists, and the National Association of Attorney Generals to initiate a Coroner Liaison position in 2021. The goals of the position were to:

- Assist and support each of the coroner offices and identify avenues for