



# Case #43

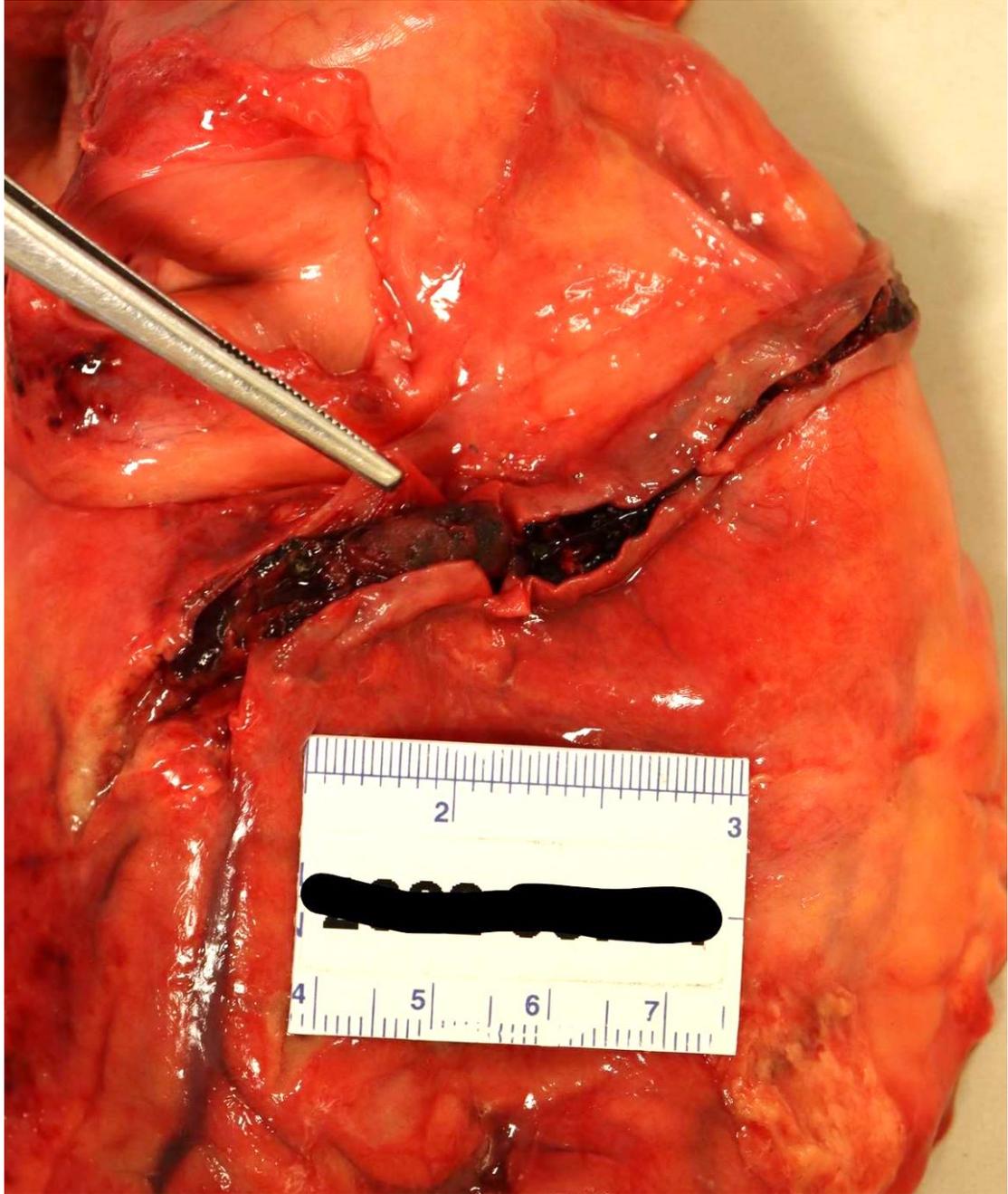
NAME Educational Activities Committee

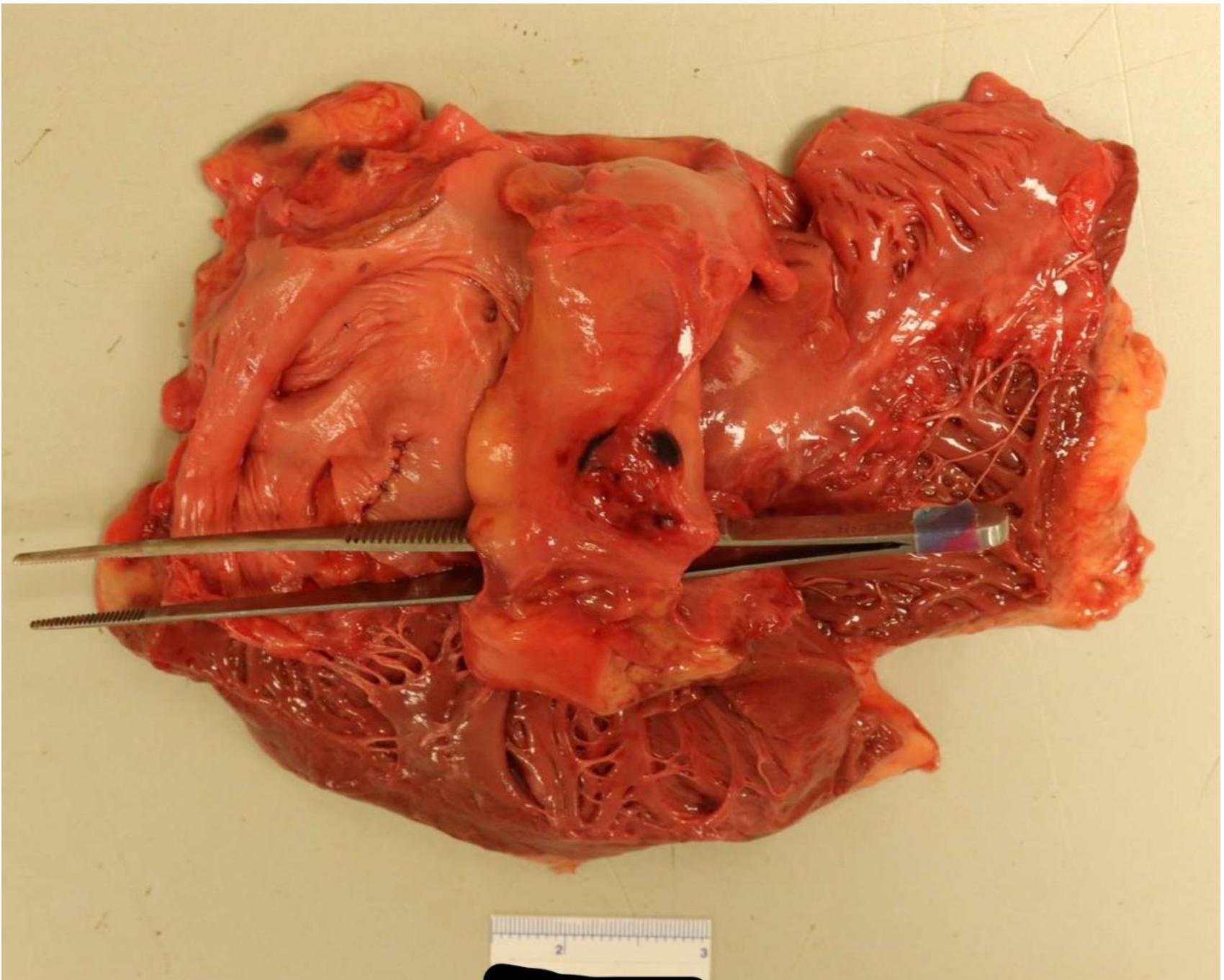
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An elderly woman underwent coronary artery bypass grafting 10 days before she died at a care facility. Her family alleged that she was poisoned due to her acute mental status changes on the day of her death. An autopsy was requested and revealed the following finding in one of her venous grafts (Image 1) and a widely patent foramen ovale (Image 2).

Which of the following is the most likely cause of the finding in her venous graft?

- A. Underlying clotting disorder
- B. Poisoning
- C. Deep venous leg thrombosis
- D. Graft atherosclerosis
- E. Intraoperative complication

Answer...

## C. Deep venous leg thrombosis

Examination of the right coronary artery graft (saphenous vein) revealed a 5 cm occlusive clot. For venous grafts, the most common etiology of acute graft failure is procedurally related direct endothelial injury or activation, leading to thrombosis (see answer E below). However, a paradoxical embolism involving the coronary artery graft may also be considered. A paradoxical embolism, or embolism from the venous circulation through an intracardiac defect, may cause acute arterial occlusion. Involvement of the arterial vasculature of the brain, heart, and gastrointestinal tract have been reported. Here, a patent foramen ovale was identified, as was a subsegmental pulmonary thromboembolism. Subsequently, a posterior leg dissection revealed unilateral deep venous thrombosis (See image 3). A paradoxical embolism causing coronary artery graft occlusion arose from a venous thrombosis of the leg, passing from the right to left side of the heart via the patent foramen ovale.



## Other responses:

### A. Underlying clotting disorder

Traditional laboratory testing for thrombophilia is limited in the postmortem setting, especially testing involving labile blood specimens for protein C, S, and antiphospholipid syndrome. Certain molecular testing for common prothrombotic mutations, including factor 5 Leiden and prothrombin mutations, can be requested on autopsy specimens. In this case, a clotting disorder should be considered, but less likely since the decedent was elderly and had no history of clotting disorders.

### B. Poisoning

Certain poisoning agents, including toxic metals, carbon monoxide, and organophosphates, have been associated with venous and arterial thrombosis. The investigative information and localized coronary artery bypass graft clot were most consistent with non-toxicologic etiologies.

### D. Graft atherosclerosis

While venous grafts used in coronary artery bypass may develop intimal hyperplasia and atherosclerosis over time, the death was within 10 days of the surgery. It would be highly unusual for the vein to have significant atherosclerosis at the time of harvesting and implantation.

### E. Intraoperative complication

Intraoperative complication should certainly be a consideration in this case. However, the grafts were intact with no evidence of trauma to the vessels. Also, one would expect most intraoperative complications from this type of surgery to manifest earlier than 10 days out. Regardless, a careful review of the medical records and surgical report would be recommended.

# References:

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