

## BACKGROUND

- Adrenaline, takotsubo cardiomyopathy (TT), anaphylaxis, and Kounis hypersensitivity-associated coronary syndrome (ATAK) is a rare medical complex that often presents as a challenging diagnostic dilemma.
- This complex often overlaps with TT and Kounis syndrome (KS). KS is a type of “allergic myocardial infarction” or “allergic angina” induced by vasospastic mediators after an allergic event [1].
- This case highlights the rare occurrence of ATAK and a type I Kounis syndrome triggered by anaphylaxis and epinephrine.

## CASE PRESENTATION

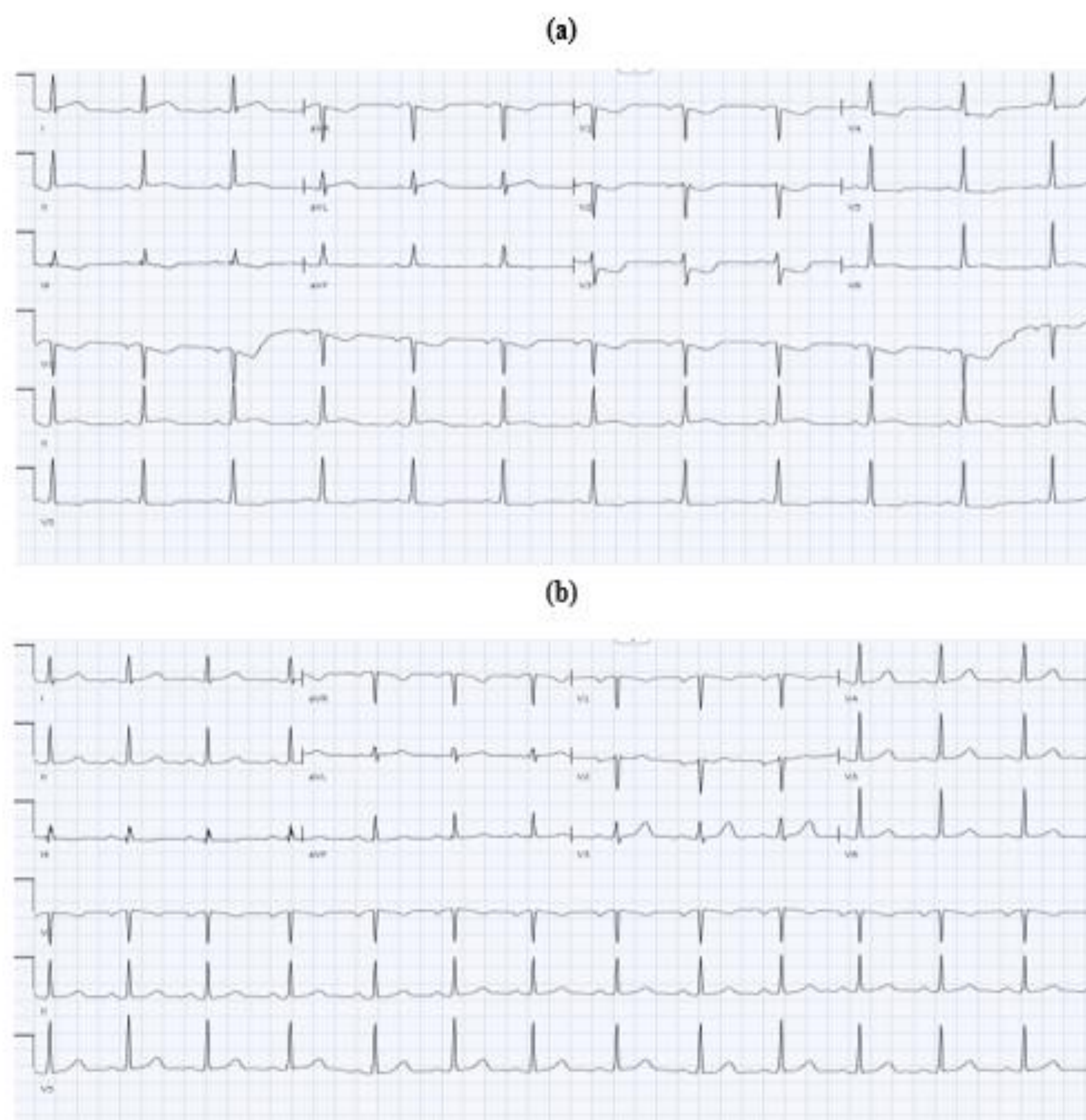
- A 32-year-old male with no medical history presented with lip swelling and hives 30 minutes after consuming shellfish.
- On the route to the hospital, emergency medical services administered epinephrine 0.3mg intramuscularly (IM) via auto-injector for anaphylaxis. Immediately after receiving epinephrine, he developed severe 10/10 central crushing chest pain (CP) associated with diaphoresis. He described the pain as the worst CP of his life.
- On arrival at the emergency department, his vitals were significant for T: 97.2°F, RR: 22, BP: 91/59, and pulse: 105/bpm.
- On examination, there was no angioedema or urticaria. An EKG (Figure 1a) showed ST elevations in leads I, II, aVL, and ST depressions in V1-V4. Posterior lead EKG showed ST elevations in V7-V9. One-hour high-sensitivity troponin was 46 ng/L (normal <34 ng/L).
- A catheter alert was called for acute coronary syndrome (ACS), and he received 324mg of aspirin and 5000 units of intravenous (IV) heparin.

## CASE PRESENTATION CONTINUED

- Emergent coronary angiography showed no obstructive coronary artery disease (Figure 2). A ventriculogram demonstrated an ejection fraction (EF) of 35-40%, with akinesis of the basal segments suggesting reverse TT.
- High sensitivity troponin post angiography was 4500 ng/L.
- He was treated for anaphylaxis with IV methylprednisolone, IV famotidine, and IV diphenhydramine, and his symptoms resolved. An EKG on day 3 (Figure 1b) showed a resolution of ST changes, and repeat echocardiography demonstrated improved EF to 55% with a resolution of basal akinesis, confirming TT. He was discharged home and will follow up with an allergy specialist.

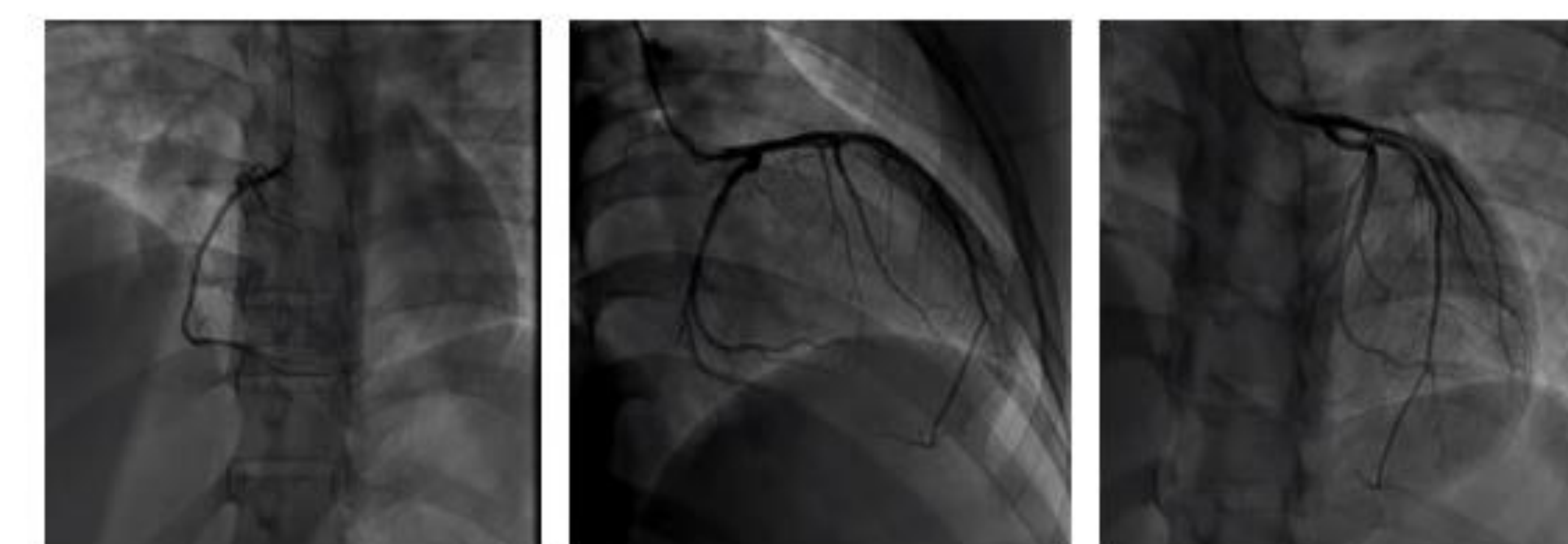
## IMAGING

Figure 1: EKGs during hospital admission



## IMAGING CONTINUED

Figure 2: Images from coronary angiography



Coronary angiography showing normal coronaries without occlusive disease: (A) right coronary artery, (B) left circumflex artery, and (C) left anterior descending artery.

## DISCUSSION

- Our patient developed anaphylaxis after consuming shellfish and developed symptoms of ACS after epinephrine administration. He was diagnosed with ATAK, formed by a type I KS and reverse TT precipitated by anaphylaxis and epinephrine. The most common variant of KS is type I, which is due to coronary artery vasospasm triggered by inflammatory mediators released from mast cells [2]. Treatment of his anaphylaxis and avoidance of epinephrine resulted in clinical improvement and resolution of his EKG and echocardiogram findings. Currently, no systemic treatment plan exists for ATAK, and management is usually supportive.

## CONCLUSION

- This case aims to bring awareness to the rare diagnosis of ATAK and the importance of early coronary angiography and careful management of anaphylaxis in these patients.

## REFERENCES

1. Kounis NG, Zavras GM. Histamine-induced coronary artery spasm: the concept of allergic angina. *Br J Clin Pract.* 1991;45(2):121-128
2. Ballesteros RV, Polo JCG, Olmos C, Vilacosta I. Kounis and Takotsubo, Two Syndromes Bound by Adrenaline: The “ATAK” Complex. *Case Rep Cardiol.* 2023 Sep 14;2023:7706104. DOI: 10.1155/2023/7706104. PMID: 37744893; PMCID: PMC10513855.