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Yet another explanation for Pheidippides death?

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About 2500 years ago, Pheidippides — a legendary Greek *hemerodrome* or courier, who according to the legend died shortly after running from Marathon to Athens to bring the news about Greek's victory over the Persians. The very cause of his death remains undetermined [1].

We want to propose yet another explanation for Pheidippides's death based on the case of a 35-year-old man — amateur ultramarathon runner who was admitted to the emergency department with severe fatigue and skeletal muscle pain lasting over two days after a 210 km 24-hour run. History was negative for anabolic steroids or other medication.

Glasgow coma scale on admission — 13 points. His electrocardiography (ECG) on admission (**Figure 1**) showed bradycardia with junctional rhythm 25/min. After administration of atropine 0.5 mg i.v. rhythm accelerated to 45 BPM with no visible P waves. Elevations of J-point in anterior leads and broad, peaked T waves were observed. Echocardiographic study showed hypokinesis of the apical segments of the left ventricle with ejection fraction of 40%, with no significant valvular disease. After bladder catheterization, dark-colored brown urine was obtained.

Blood tests showed severe hyperkalemia (8.4 mmol/l) with high creatinine level (6.18 mg/dl) and low estimated glomerular filtrated rate (eGFR, 11.05 ml/min/1.73 m²), along with extreme serum myoglobin concentration (>30 000 ng/ml), CK-MB mass (>300 ng/ml) and elevated troponin T (0.109 ng/ml), white blood cell count and CRP. Patient was diagnosed with exercise-related rhabdomyolysis, which led to acute kidney injury with consecutive hyperkalemia and — hemodialysis in intensive care unit was introduced. He recovered after 4

weeks with restoration of normal ECG and normal left ventricular function (ejection fraction [EF], 58%, global longitudinal strain [GLS], 19,7%).

Rhabdomyolysis with renal failure may represent a possible explanation of Pheidipides's death [2] — especially while taking into account that distances he made are similar of those made by our patient. Athenian runner had run from Athens to Sparta (212 km) within 4 days, and on the next day — again ran from Athens to the battlefield near Marathon (40 km) and back to Athens to bring the news of victory. Both he and our patient were properly trained with previous experience in running similar distances.

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REFERENCES

1. Oikonomou E, Chrysohoou C, Vlachopoulos C, et al. The aetiology of death for marathon runner Phidippides? *Eur Heart J*. 2019; 40(31): 2564–2565, doi: [10.1093/eurheartj/ehz560](https://doi.org/10.1093/eurheartj/ehz560), indexed in Pubmed: [31411721](https://pubmed.ncbi.nlm.nih.gov/31411721/).
2. Zager RA. Rhabdomyolysis and myohemoglobinuric acute renal failure. *Kidney Int*. 1996; 49(2): 314–326, doi: [10.1038/ki.1996.48](https://doi.org/10.1038/ki.1996.48), indexed in Pubmed: [8821813](https://pubmed.ncbi.nlm.nih.gov/8821813/).

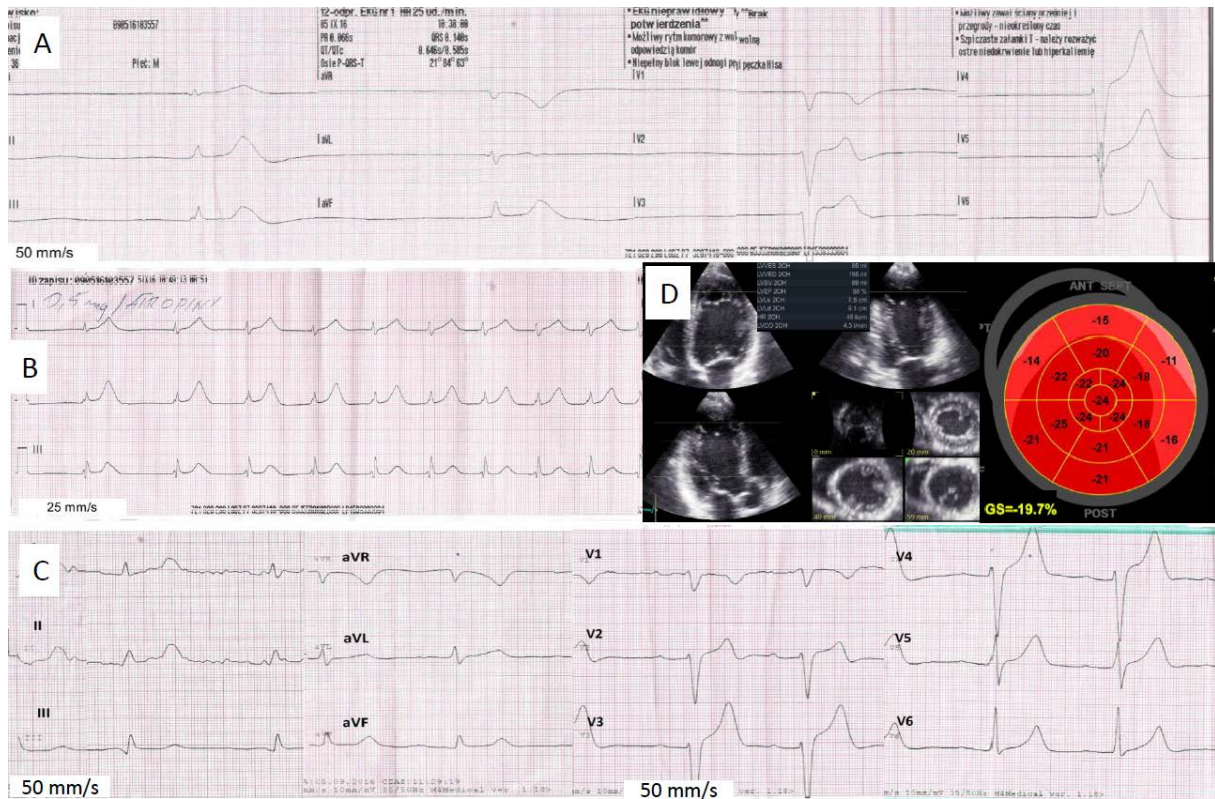


Figure 1. A. Electrocardiography (ECG) on admission-bradycardia with junctional rhythm 25/min. **B.** After administration of atropine 0.5 mg i.v. rhythm accelerated to 45 BPM with no visible P waves. Elevations of J-point in anterior leads and broad, peaked T waves were observed. **C, D.** ECG and transthoracic echocardiography at discharge showing restoration of normal ECG and normal left ventricular function (ejection fraction, 58%; global longitudinal strain, 19,7%)

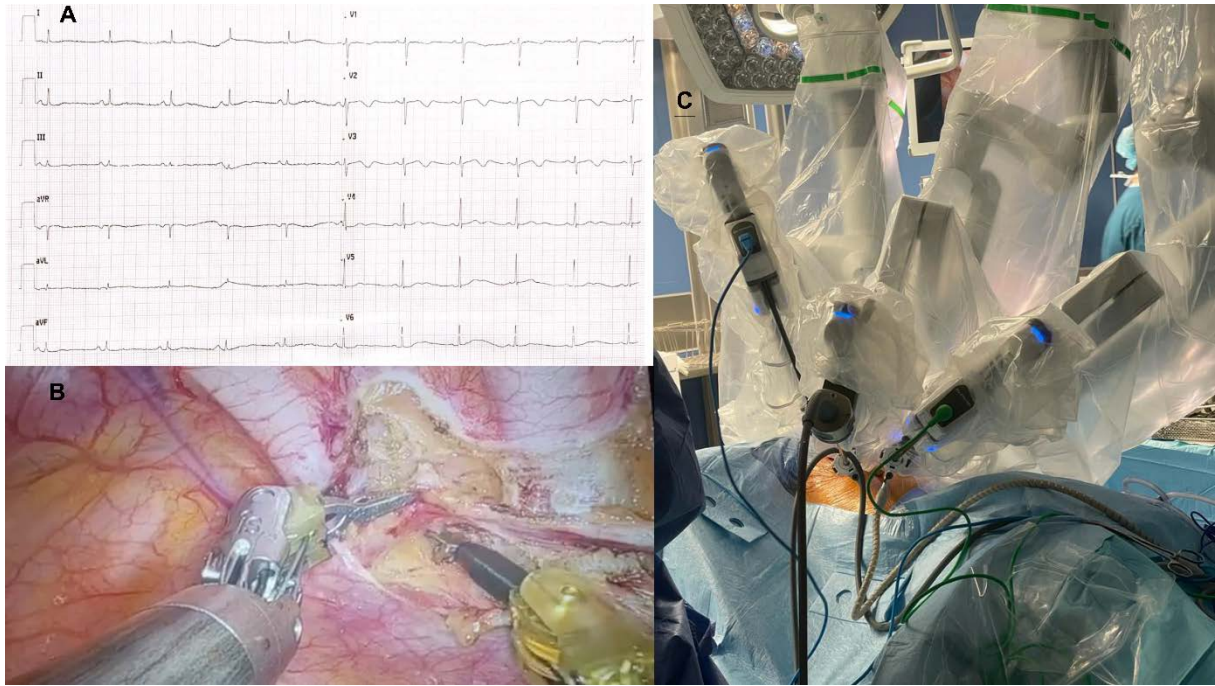


Figure 1. **A.** Standard, 12-lead electrocardiography, 25 mm/s. Normal sinus rhythm 60 bpm, normal PQ interval, narrow QRS complexes, QTc 540 ms. See abnormal T wave morphology, particularly in precordial leads. **B.** Intrathoracic camera view of T2–T4 sympathetic chain dissection. **C.** Access and robotic arms configuration during sympathectomy