EP CASE REPORT

An unusual cause of pseudo-pulseless electrical activity

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Case report

A 75-year-old male farmer suffered cardiac arrest in a steep alpine cow pasture. Bystander cardiopulmonary resuscitation (CPR) was not provided. A paramedic and emergency physician were airlifted onsite, exiting from a hovering helicopter as the terrain was unsuitable for landing. They started CPR at 20 min post-arrest. The electrocardiogram (ECG) tracing showed pulseless electrical activity (PEA) at 45 b.p.m. Endotracheal intubation was performed for clinically obvious bronchoaspiration. Initial $EtCO_2$ was of 0.8 kPa. After 5 mg of epinephrine, the patient had persistent PEA at 45 b.p.m. The physician was surprised by the presence and persistence of electrical activity given the other negative prognostic factors (prolonged no flow and low initial $EtCO_2$).

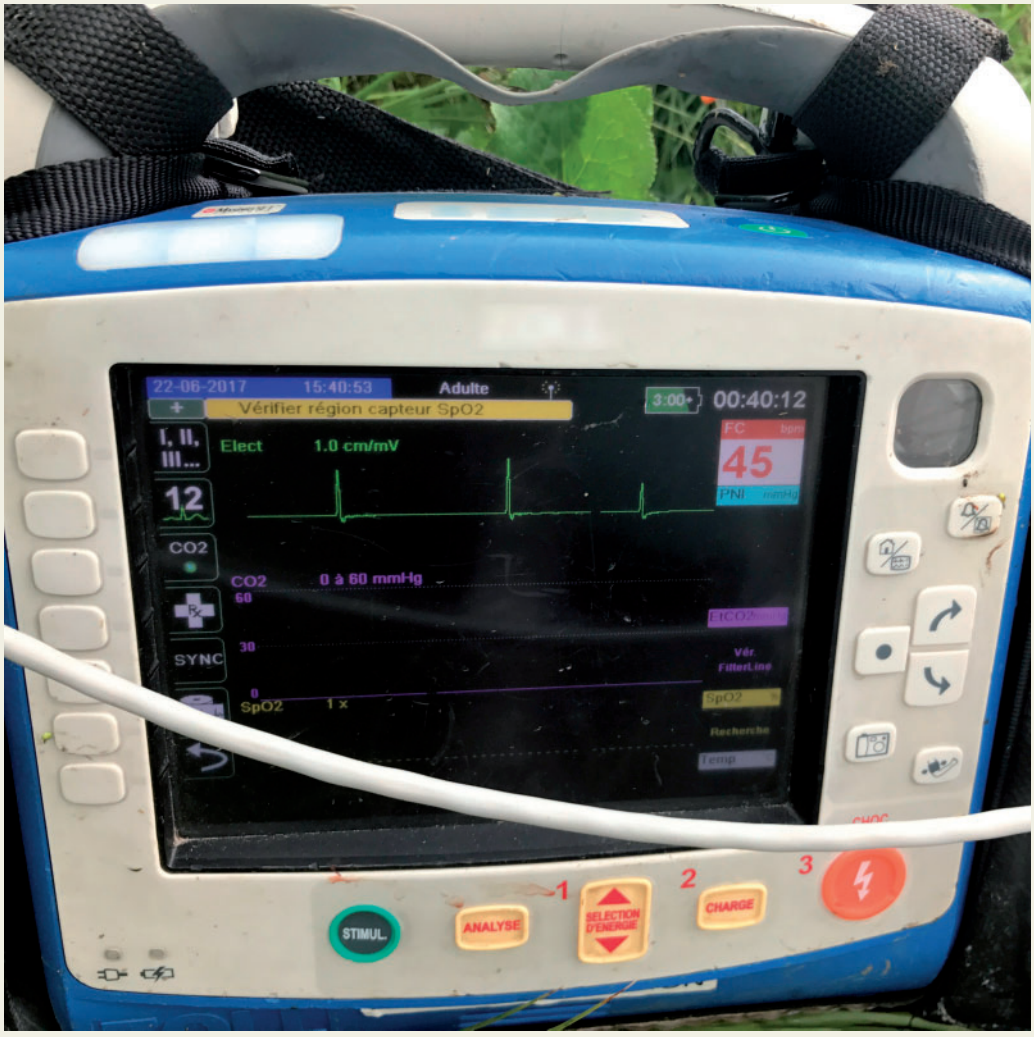

Figure 1 Automated external defibrillator showing a pseudo-pulseless electrical activity cause by an electrical fence in contact with the ground.

The patient had no cardiac stimulator. The physician considered patient evacuation for further hospital care. He called the receiving hospital and they consensually decided to terminate resuscitation due to numerous negative prognostic factors, including no ROSC after 30 min of

professionally provided CPR. The patient was declared dead on site. However, the 45 b.p.m. electrical activity persisted (*Figure 1*). The rescue team finally discovered that an electrical fence in contact with the ground was the source of this artefact (see Supplementary material online, *Appendix S1 Video*).

Discussion

This case of pseudo-PEA is interesting. First, to our knowledge, this cause of pseudo-PEA has never been described. Second, it led to unjustified prolongation of futile resuscitation efforts. Finally, the demonstration that the electrical fence was the cause of this highly disturbing artefact by its appearing and disappearing with connection and disconnection of the electrical fence wire was unequivocal (see Supplementary material online, *Appendix S1 Video*).

Pseudo-PEA may have clinically important consequences, leading to under treatment as well as overtreatment. The detection of pseudo-spikes may be erroneously diagnosed as PEA, masking the diagnosis of underlying ventricular fibrillation, leading to abstention from potentially life-saving defibrillation.[1] On the other hand, an unrecognized pseudo-PEA may lead, as in our case, to continuation of futile resuscitation, as asystole in the field is usually required as an indication for termination of resuscitation if there is no obvious reversible cause.[2] Interpreting the ECG tracing as a PEA led in our case to time-consuming, futile reanimation efforts, and came close to putting the rescue team at some risk, as the evacuation would have required patient and physician winching.

The minimal recommended distance between an electrical fence and a heart device is of 12-inches.[3] However, it is not explicit stated if this is the minimum distance to avoid putting the patient at risk or to avoid spurious, but harmless, readings. In our case, the thick, wet grass covering the area must have contributed extra conductivity leading to our discovery of this strange phenomenon.

Supplementary material

Supplementary material is available at *Europace* online.

Conflict of interest: none declared.

References

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