Letter to the Editor

Successful treatment of refractory cardiac arrest by emergency physicians using pre-hospital ECLS

Sir,

A 32-year-old man with no previous medical history experienced a cardiac arrest (CA), during a sporting session. A witness immediately performed CPR and called the emergency medical services (EMS). An AED was connected by bystanders and delivered one shock. After 10 min the patient returned to spontaneous circulation (ROSC) Simultaneously a mobile intensive care unit (MICU) arrived on scene and started specialized care. Shortly after ROSC the ventricular fibrillation (VF) recurred and advanced life support was initiated for this second CA according to international guidelines. Despite this treatment persistent VF was observed. During CPR, signs of life were noted. After 10 min of unsuccessful resuscitation, the MICU and the EMS dispatching physicians decided that the patient was eligible for extra corporeal life support (ECLS). A recently created ECLS mobile team was dispatched to the scene. This team comprised 2 emergency physicians, and 2 paramedics, was equipped with a portable ECLS device (Maquet, Wayne, NJ, USA, Cardiohelp V3.2) and had been trained to set it up and transport patients to hospital. The ECLS insertion procedure was started after 30 min of unsuccessful resuscitation. The venous and arterial cannulae were respectively inserted within 5 min in the femoral area. Finally 60 min after the second CA ECLS was working correctly. After 9 min of ECLS, the patient sustained a durable ROSC but ECLS was resumed to preserve an effective reperfusion. Following transfer to hospital, the patient was directly transferred for investigation in the cardiac catheterisation laboratory, but no coronary lesion was discovered. Echocardiography revealed a hypertrophic cardiomyopathy.

After emergency management, the patient was admitted in the ICU for therapeutic hypothermia. The patient was weaned, at days 2 from ECLS and at days 8 from mechanical ventilation. The neurological outcome was extremely favourable and the patient was scored CPC 1 without any noticeable deficit. Anti-arhythmic treatment was added and it was decided to implant an internal defibrillator. The patient was discharged from the hospital 22 days after the CA discussed (Figs. 1 and 2).

ECLS has been recently introduced for the treatment of refractory CA and improvement of survival was observed for in-hospital cardiac arrest patients (20% with good neurological status). However this improvement has not been observed in out-of-hospital CA. Le Guen et al. studied a series of 51-witnessed refractory CA managed by ECLS on arrival in hospital. They observed only 2 survivors (4%). This poor result can be explained in part by the delay between the CA and the initiation of ECLS. In order to reduce this delay we decided to test the feasibility of setting up ECLS on site. Last year, was reported on site ECLS treatment, by cardiac surgeons, with unsuccessful results. One of the problems is the availability

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Fig. 1. Time scale of events.

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of cardiac surgery team for EMS. Emergency specialists with specific training have already successfully inserted ECLS in ER. A mobile ECLS team with emergency physicians trained to install and control ECLS in ICU was implemented. To our knowledge we report here the first case of successful on-site ECLS treatment by emergency physicians for refractory CA. Further studies are needed to analyze the potential benefit of this technique.

Conflict of interest statement

No conflicts to declare.

References


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