

# Assessment of the effectiveness of chest compressions with transesophageal echocardiography during cardiac arrest

A.Volontè, E.Catena, R. Rech, A. Castelli, R. Colombo  
U.O.C. Anestesia e Rianimazione, Ospedale Luigi Sacco, ASST Fbf-Sacco, Milano

## Introduction

During cardiac arrest (CA), cardiac massage is essential for organ perfusion and his efficacy affects patient’s survival. In selected refractory cardiac arrests, it is possible to support the circulation with extracorporeal cardiopulmonary resuscitation (ECPR). Transesophageal echocardiography (TEE) could help the clinicians suggesting diagnostic and prognostic elements during CPR.

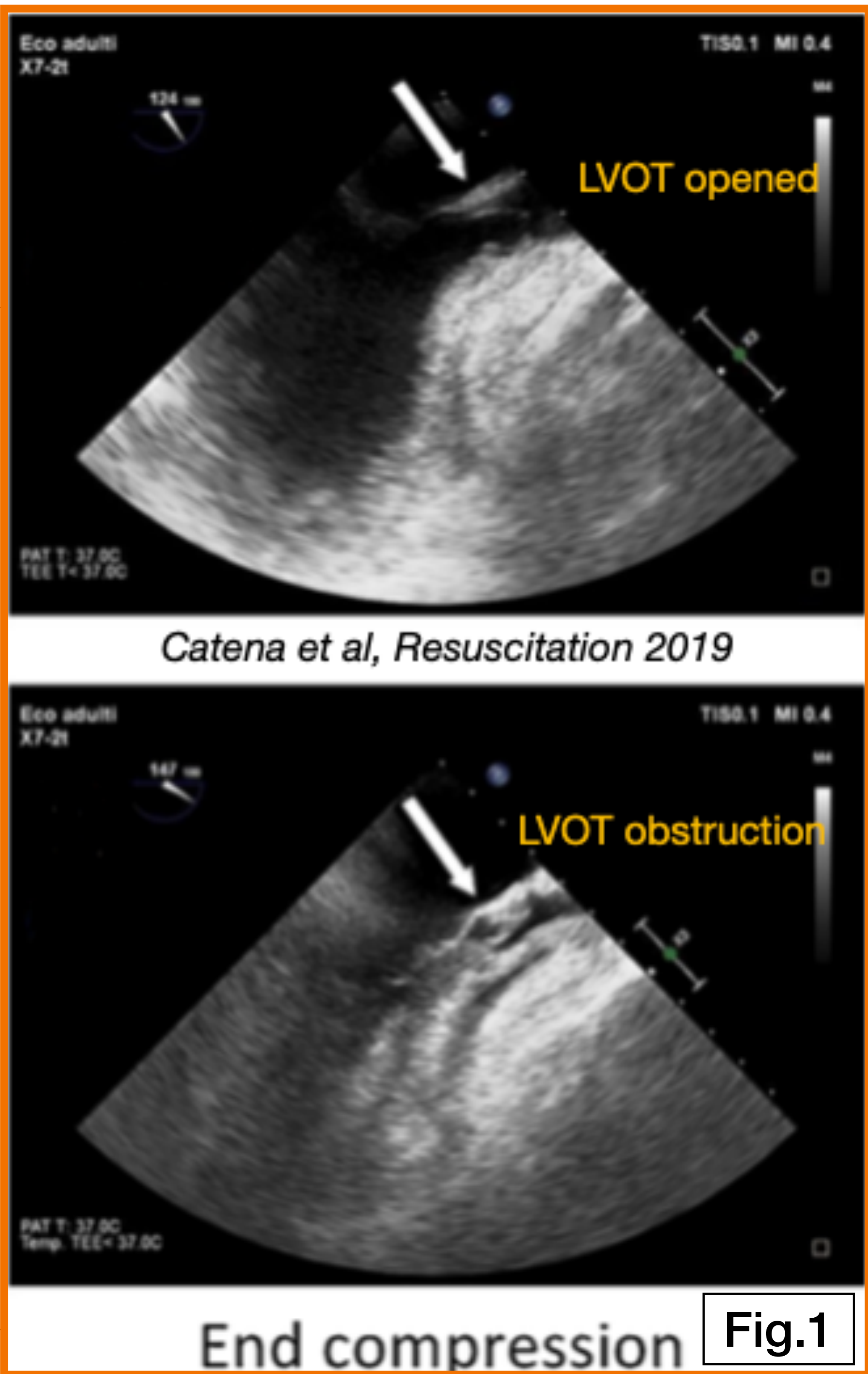
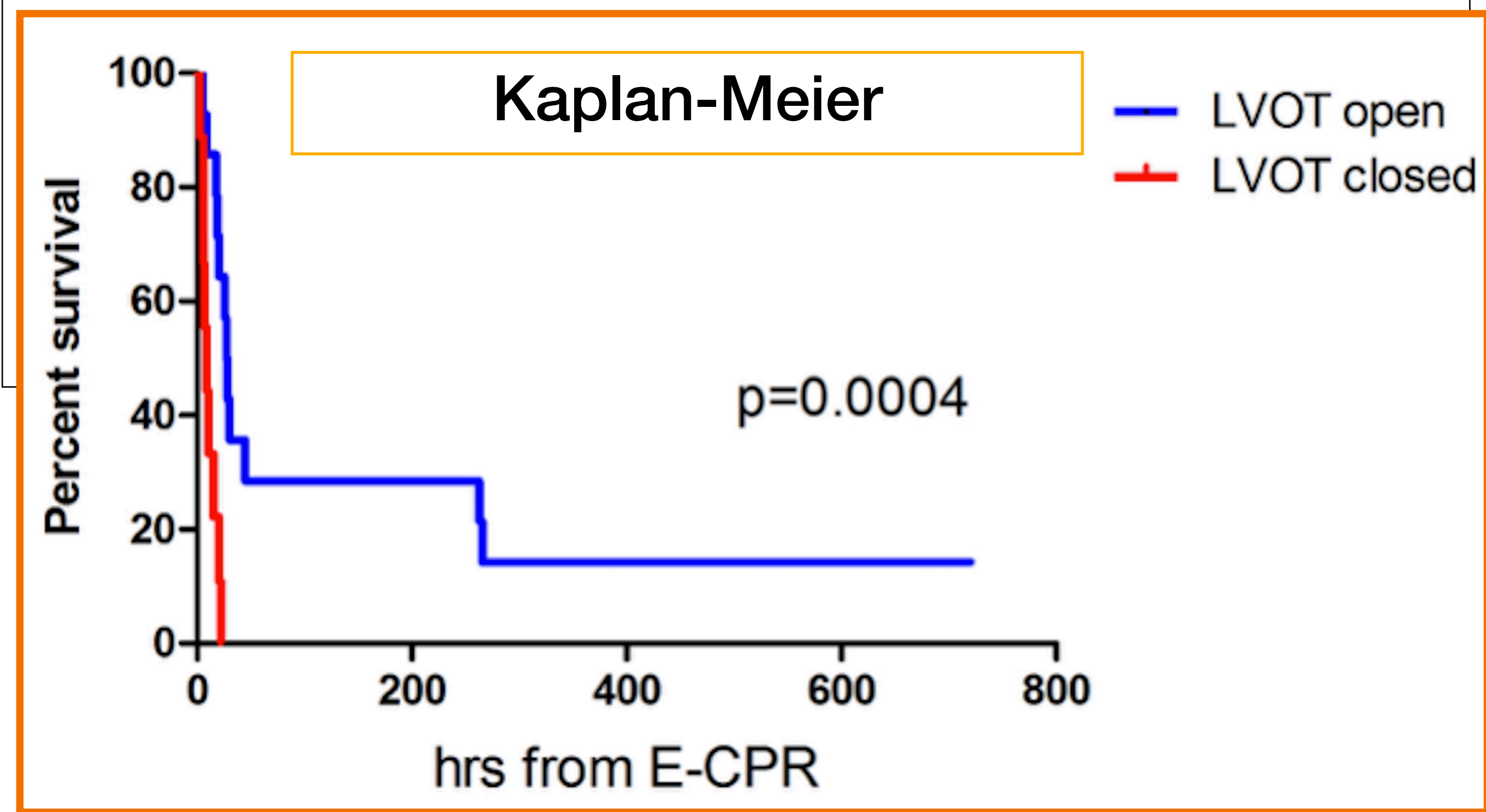
This study aims to assess by TEE the association between the opening of left ventricular outflow tract (LVOT) and the effectiveness of chest compressions, defined as 24 hours-survival from the CA.

## Materials and Methods

Between 2016 and 2019, 23 patients with refractory out-of-hospital CA were studied. All the cases were eligible to ECPR according to protocol of ECMO–ACC–AREU of Milan. On the patient arrival at the emergency department, a focused TEE exam was performed. The following parameters were analyzed off line: right ventricular fractional area change, right ventricular outflow tract fractional shortening, left ventricle volumes and ejection fraction, LVOT and aortic root diameters.

## Results

After 24 hours, 9 patients survived and 14 were dead; 2 survived 24 months after hospital discharge. LVOT opening resulted in all the survivals and in 5 of the patients not survived (p 0,003). The times of no flow, low flow, event to shock, event to ECPR and the presence of automated mechanical device were not statistically significant, respectively with p 0.51, 0.77, 0.29, 0.28, 0.25.



## Discussion and Conclusion

According to some theories, LVOT obstruction is attributed to compressions position on the chest. The same position corresponds to internal different structures: sometimes the aortic root or LVOT are compressed, but not the ventricles. Our hypothesis is that the anterior leaflet of the mitral valve may be moved toward the inter ventricular septum as a consequence of ischemic morfofunctional damages during CA (fig1).

In our experience, the LVOT opening could represent a parameter of CPR effectiveness and correlated the 24 hours survival.