Revisió Bibliogràfica:
ACR i PPT
OHPTCA - TCPA


Resumen Ejecutivo de las Guías 2015 del European Resuscitation Council

Aspectos destacados de la actualización de las Guías para RCP y ACE de 2015

American Heart Association
Resumen Ejecutivo de las Guías 2015 del European Resuscitation Council
Survival and neurologic outcome after traumatic out-of-hospital cardiopulmonary arrest in a pediatric and adult population: a systematic review

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Conclusions: Children have a higher chance of survival after resuscitation of an out-of-hospital traumatic cardiac arrest compared to adults but tend to have a poorer neurological outcome at discharge.

Key messages
- Children have a higher chance of survival after resuscitation of an OHCA compared to adults, but tend to have a poorer neurological outcome on discharge from hospital.
- Long-term survival is significantly different with 3.3% in a mixed adult/child population and 13.6% in a pediatric population.
- Long-term survival is good and moderate neurological recovery is reported in 57.4% of all survivors in a mixed adult/child population and in 51.1% of a pediatric population.
- Starting CPR in trauma patients may be worthwhile and trauma management programs should be discussed critically.
Study regarding the survival of patients suffering a traumatic cardiac arrest

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That is why, in this study, except for patients who were already dead at the moment of their arrival in the hospital, we considered that everybody had at least one chance to be resuscitated [11].
Trumatic cardiac arrest in the emergency department—Overview upon primary causes

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![Pie chart showing primary causes of traumatic arrest]

**Fig. 2 Primary causes of traumatic arrest**
Specifically for arrests associated with trauma, 100% of these patients did not have a return of spontaneous circulation and were subsequently pronounced deceased. The average age of traumatic arrests was 30.8 years.

Cardiopulmonary resuscitation in the ED was not performed on 66.7% of these patients. This certainly supports a high rate of mortality resulting from trauma, and affecting a younger age group in Saudi Arabia.5

The cause of arrest was not confirmed by postmortem examination because of cultural standards.

An over-all mortality rate of 95.8% was documented, as well as a low rate of bystander cardiopulmonary resuscitation being performed, and a family member transported most patients to the hospital.
Traumatic cardiac arrest: should advanced life support be initiated?

Leis CC1, Hernández CC, Blanco MJ, Paterna PC, Hernández Rde E, Torres EC.

Abstract

BACKGROUND:
Several studies recommend not initiating advanced life support in traumatic cardiac arrest (TCA), mainly owing to the poor prognosis in several series that have been published. This study aimed to analyze the survival of the TCA in our series and to determine which factors are more frequently associated with recovery of spontaneous circulation (ROSC) and complete neurologic recovery (CNR).

METHODS:
This is a cohort study (2006-2009) of treatment benefits.

RESULTS:
A total of 167 TCAs were analyzed. ROSC was obtained in 49.1%, and 6.6% achieved a CNR. Survival rate by age groups was 23.1% in children, 5.7% in adults, and 3.7% in the elderly (p < 0.05). There was no significant difference in ROSC according to which type of ambulance arrived first, but if the advanced ambulance first, 9.41% achieved a CNR, whereas only 3.7% if the basic ambulance first. We found significant differences between the response time and survival with a CNR (response time was 6.9 minutes for those who achieved a CNR and 9.2 minutes for those who died). Of the patients, 67.5% were in asystole, 25.9% in pulseless electrical activity (PEA), and 6.6% in VF. ROSC was achieved in 90.9% of VFs, 60.5% of PEAs, and 40.2% of those in asystole (p < 0.05), and CNR was achieved in 36.4% of VFs, 7% of PEAs, and 2.7% of those in asystole (p < 0.05). The mean (SD) quantity of fluid replacement was greater in ROSC (1,188.8 [786.7] mL of crystalloids and 487.7 [688.9] mL of colloids) than in those without ROSC (890.4 [622.4] mL of crystalloids and 184.2 [359.3] mL of colloids) (p < 0.05).

CONCLUSION:
In our series, 6.6% of the patients survived with a CNR. Our data allow us to state beyond any doubt that advanced life support should be initiated in TCA patients regardless of the initial rhythm, especially in children and those with VF or PEA as the initial rhythm and that a rapid response time and aggressive fluid replacement are the keys to the survival of these patients.

LEVEL OF EVIDENCE:
Therapeutic study, level IV; epidemiologic study, level III.
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Resumen Ejecutivo de las Guías 2015 del European Resuscitation Council

Parada cardíaca/ ¿Situación peri-parada?

- Asegurar la colocación del tubo traqueal en la tráquea (ver más adelante para más detalles).
- Monitorización ventilatoria durante la RCP y evitar la hiperventilación.
- Monitorización de la calidad de las compresiones torácicas durante la RCP. Los valores de CO2 al final de la espiración se asocian con una mejor supervivencia.
- Si el paciente está hecho en el suelo o si la espina cervical está doblada, se debe probar la aplicación de un collarín cervical por quien proporcione primeros auxilios, ya que no se recomienda. Si se sospecha lesión de la columna cervical, se debe sostener manualmente la cabeza en una posición que limite el movimiento en cualquier ángulo hasta que se disponga de asistencia sanitaria experimentada.

¿STOP?
Guidelines for Withholding or Termination of Resuscitation in Prehospital Traumatic Cardiopulmonary Arrest

The National Association of EMS Physicians (NAEMSP) Standards and Clinical Practice Committee and the American College of Surgeons Committee on Trauma

1. blunt trauma with apnea, pulselessness, and no organized electrocardiogram activity;

2. penetrating trauma with the preceding clinical presentation and no other signs of life;

3. ≥15 minutes of cardiopulmonary resuscitation without return of spontaneous circulation;

4. EMS-witnessed TCPA followed by ≥15 minutes of unsuccessful resuscitation en route to the emergency department (ED)
CONCLUSIONES

Simultánea aborde causas reversibles

1. Controle la hemorragia externa catastrófica
2. Controle la vía aérea y maximice la oxigenación
3. Descompresión torácica bilateral
CONCLUSIONES

1. Controle la hemorragia externa catastrófica
2. Controle la vía aérea y maximice la oxigenación
3. Descompresión torácica bilateral
1. Controle la hemorragia externa catastrófica

Uncontrolled haemorrhage is the commonest cause of preventable death in trauma [24], and survival from exsanguination and true TCA is very rare [1,25]. The

![Damage control resuscitation](image)

**Fig. 4.4.** Principles of damage control resuscitation in trauma.

- Treat compressible external haemorrhage with direct pressure (with or without a dressing), use tourniquets if needed and/or apply topical haemostatic agents.¹⁷³
- Non-compressible haemorrhage is more difficult. Use splints (pelvic splint), blood products, intravenous fluids and tranexamic acid while moving the patient to surgical haemorrhage control.
permissive hypotension until surgical haemostasis is achieved. Permissive hypotension allows intravenous fluid administration to a volume sufficient to maintain a radial pulse.\textsuperscript{175,176}

setting if available. Pre-hospital activation of major transfusion protocols should diminish the time required for the patient to receive

authors contend that blood is currently the resuscitation fluid of choice in TCA patients and should be utilised pre hospital if available.

Tranexamic acid (TXA) (loading dose 1 g over 10 min followed by infusion of 1 g over 8 h) increases survival from traumatic haemorrhage.\textsuperscript{182} It is most effective when administered within the first hour and certainly within the first 3 h following trauma.\textsuperscript{182} Give TXA in the prehospital setting when possible.
Oxygenation with endotracheal intubation and positive pressure ventilation should be achieved as early as possible to correct airway obstruction and hypoxia and prevent traumatic asphyxia. It is key to ensure etCO2 is attached and monitor. It has been shown that an etCO2 $\leq 1.3$kPa has limited survival and cessation of resuscitation should be considered.

Review of TCA cases that have undergone endotracheal intubation without induction/paralytic medications illustrate higher mortality than in those cases that have required medication-facilitated intubation, likely illustrating a greater level of associated traumatic brain injury.

Conclusions: In this multicentre prospective study in Japan, we observed a high overall success rate in airway management during trauma care. However, the methods of intubation and success rates were highly variable among hospitals.
3. Descompresión torácica bilateral

Relying on clinical signs of the thorax alone will not identify all patients with these injuries, and our data support extending the practice into all patients with a suitable mechanism of injury together with external evidence of chest injury.

A proportion of patients will have soft tissue greater than the length of a standard 14-gauge cannula when placed in the second intercostal space, in the mid-clavicular line, which may lead to ineffective chest decompression. Cannulae are also prone to kinking or blockage.

Positive pressure ventilation [20-22]. An open thoracostomy also allows for complete lung re-expansion and easy thoracic reassessment. Cuffed tracheal tube insertion into the open thoracostomy should be considered when there is difficulty in maintaining patency due to excessive soft tissues [23]. The authors’ opinion is that all TCA patients with chest injuries should have bilateral open thoracostomies to proactively exclude tension pneumothoraces.

https://www.youtube.com/watch?v=co9_RLN781Y
Thus, many algorithms recommend **immediate bilateral decompression in blunt, and ipsilateral decompression in penetrating TCA**. Though eventual placement of chest tubes is indicated in the setting of return of spontaneous circulation (ROSC), this can be deferred until successful resuscitation, as PPV can facilitate rapid re-inflation of underlying lung and resolution of tension physiology.

Obstruction or kinking, can cause iatrogenic injury, can be incorrectly sited in 40% of patients and is expected to fail in 42.5% of patients due to the chest wall thickness. Conversely, tube thoracostomy has been shown to be more effective at evacuating tension pneumothoraces during cardiac arrest, and prehospital placement is a predictor of survival in TCA (odds ratio = 0.3, 95% confidence interval = 0.13 to 0.8). The personnel are limited. During initial resuscitation this procedure can be shortened to perform a dissection and finger sweep into the thoracic cavity (thoracostomy) allowing diagnosis (audible release of air or appreciation that the lung is not adjacent to the thoracic wall) and treatment. Furthermore, haemothorax can be identified, the volume of...
ILUSIONES

Figura 1.11 Algoritmo de parada cardíaca traumática
4. Aliviar el taponamiento torácico
5. Cirugía para control de hemorragias o compresión aórtica proximal
6. Protocolo de transfusión masiva y fluidos

diac wounds, resulting in pericardial tamponade. The majority of traumatic pericardial tamponades contain considerable volumes of clotted blood and there is no place for needle pericardiocentesis in treatment. Therefore thoracotomy and formal pericardotomy

If ROSC is not achieved with simultaneous interventions then an Immediate Clamshell Thoracotomy should be considered and performed. The current Timeline guidance for this is within 15 minutes for Penetrating Trauma and within 10 minutes for Blunt Trauma.

trauma-induced coagulopathy [25]. This involves the early transfusion of packed red blood cells, fresh frozen plasma and platelets accompanied by tranexamic acid, while limiting the use of crystalloids and vasopressors [25,27]. The ideal ratio of fresh frozen plasma to packed red blood cells remains contentious; a ratio of 1:1 or greater may not confer additional benefit over ratios of 1:2 to 3:4 [28].

The place of thoracic abdominal ultrasound influencing survival of patients in traumatic cardiac arrest imminence


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Is it the time to integrate “sono cardiopulmonary resuscitation” in cardiopulmonary resuscitation algorithm of traumatic cardiac arrest?

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Figure 1. Traumatic cardiac arrest and thoracotomy algorithm. *If signs of exsanguination or chest injuries, external chest compressions unlikely to be effective, and possibly detrimental. **In blunt trauma involving complex pathology, pericardiocentesis maybe a reasonable intermediate step. If ROSC not achieved, proceed to immediate thoracotomy, ALS, advanced cardiac life support; BVM, bag valve mask; ECG, electrocardiogram; ETCO2, end-tidal carbon dioxide partial pressure; ETI, endotracheal intubation; ILCOR, International Liaison Committee on Resuscitation; IPPV, intermittent positive pressure ventilation; MTC, major trauma centre; MTP, massive transfusion policy; ROSC, return of spontaneous circulation; SGA, supra-glottic airway; VF, ventricular fibrillation; VT, ventricular tachycardia.
Commentary and concepts

Development of a simple algorithm to guide the effective management of traumatic cardiac arrest

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BLS: basic life support, ALS: advanced life support, ERC: European Resuscitation Council, IV: intravenous, IO: intraosseous
CONCLUSIONES

· Tiempo

· Metódico
  1. Controle la hemorragia externa catastrófica
  2. Controle la vía aérea y maximice la oxigenación
  3. Descompresión torácica bilateral

· Futuro