



Emergency care of the crucifixion victim

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... of all punishments, it is the most cruel and most terrifying
Cicero, first century A.D.

Of all the terrible ways to die, most people say that death by fire or death by drowning are the worst. If you lived 2000 years ago however, you most certainly would disagree. Throughout world history, one of the most feared deaths was that of crucifixion. This article will guide you through the medical, psychological, and emotional aspects of crucifixion. The death of the man called Jesus Christ will be used to illustrate the use of a punishment that was unequalled in its cruelty and depth of suffering.

This article will review not only the injuries associated with crucifixion, as well as current medical archaeological theories relating to the suffering and eventual death on a cross, but also using the introduction case study, the initial assessment and resuscitation of a crucifixion victim will be addressed. Regardless of religious beliefs, this article will give attendees a deeper awareness of "and they crucified him". © 2002 Elsevier Science Ltd. All rights reserved.

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Medic 101 to County General... We are en route with a 33-year old male who was the victim of a crucifixion. He is in traumatic arrest, intubated and 100% oxygen is being administered. We have two IV's with LR wide open and will be at your ER in 2 minutes.

When one considers the "worst ways to die", typical responses include death by drowning and death by fire. However, throughout history, a much more feared death was that of death by crucifixion. Even though crucifixion was "outlawed" as a method of execution by Constantine early in the fourth century, several descriptions of victims being crucified are found throughout subsequent history. More recently, several forensic science and mystery novels have also "resurrected" crucifixion as the way that unfortunate victims are tortured and later killed. Though quite rare,

it still is being performed as evidenced by the current practice in areas of the Philippines, where volunteers undergo crucifixion (complete with scourging and nailing to a cross, though not to the point of death) during Lent each year as penance and to show their devotion to Jesus Christ (Discovery Channel Video 2001). This article will review the injuries and causes of death associated with crucifixion, as detailed by archaeologists, theologians, and medical professionals.

In the previous paramedic report, you are told that in 2 minutes, a victim of crucifixion will be arriving at your ER. Simply put, this will be a trauma patient like no other. The Romans did not invent the idea of crucifixion; however they did perfect it. Crucifixion was created with the simple concept of maximum torture and shame for as long as a person could survive. As a rule, victims were not allowed

medical treatment after crucifixion, but this patient is about to arrive at your door.

To understand the injuries associated with crucifixion, one must first remember that the process starts long before one is "nailed" to a cross. In Roman times, scourging or flogging was a legal prerequisite to all crucifixions. A person was tied nude to a post, while one or two soldiers utilized leather straps with bones or pieces of metal at the ends to attempt to remove every piece of flesh from the back. Called the "half-death", the idea was to bring the person to be crucified "one stroke away from death". Though scourging could be used as a form of execution, the real punishment was yet to come (Edwards et al. 1986; Zugibe 1988).

After surviving the scourging, the victim had to "carry their own cross" to the place of execution. Paintings have portrayed Jesus Christ and others carrying the entire cross, however this probably was not the case. The stipes, or vertical post, was permanently fixed at the place of execution and the victim carried only the patibulum or cross-beam. As a patibulum would weigh as much as 50–125 pounds, this was no easy task, especially after surviving the brutal scourging. Throughout the "parade of shame", the victim carried a sign detailing their name and crimes, while spectators mocked the victim (Edwards et al. 1986; Zugibe 1988). When arriving at the designated site, the crucifixion truly begins.

Though ropes were occasionally used, the Romans preferred nailing as the method of choice for fixing people to the cross. The person was thrown onto the ground and a group of soldiers proceeded to drive a nail (similar to a railroad spike) through the hands/wrists/forearms to attach them to the patibulum. Then, the person was lifted onto the stipes (vertical post) and the feet, individually or together, were nailed to the cross. There is relatively minimal blood loss from the nails, however the loss from the scourging was substantial. As the victim is now suspended by the nails in the hands and feet, pain beyond all comprehension ensues as the nails rub against the great nerves. The taking of each breath involves moving the hands and feet against the nails and rubbing the bloody flesh against the rough wood (Edwards et al. 1986).

It is difficult, but not impossible to breathe as the victim hangs on the cross. However, as the lungs begin to fill with fluid, the end quickly draws near. Pleural effusions develop due the effects of the traumatic scourging and irreversible shock ensues. Soldiers at the cross offer a sip of vinegar wine as an effort to deaden the pain, however, it is too little, too late. As a result of the continuing blood loss, respiratory failure, dehydration and shock, finally, mercifully, the crucifixion victim dies. In an effort to assure the death of the victim, soldiers pierce a lance through the right chest, perforating the heart and lungs, as evidenced by the flow of "blood and water" (Edwards et al. 1986; Zugibe 1988).

Now remember that a victim of these similar tortures is being brought to your ER. Despite gruesome and distracting injuries, care of this and all major trauma patients should follow the same pathway, with attention to the immediate life threats and necessary critical actions. A patient sustaining the injuries associated with scourging and crucifixion would likely deserve endotracheal intubation and mechanical ventilation. All patients in cardiac arrest should be immediately intubated. The patient not in arrest should be intubated for depressed mental status (classically, Glasgow Coma Score of ≤ 8), absence of gag and other protective airway reflexes, ineffective oxygenation or ventilation, or reasonable expectation of any of the above.

Most theories of the exact causes of death by crucifixion have focused on respiratory failure, with the body's weight rapidly fatiguing the intercostal muscles. This leaves the diaphragm as the sole muscle driving ventilation. As the diaphragm tires, exhalation, dependant on intercostal muscles and opposed by the body's weight expanding the chest cage, is impaired, resulting in progressive CO₂ retention in an obstructive pattern similar to the severe asthma or COPD patient (Edwards et al. 1986).

Other theories suggest that the scourging prior to the actual crucifixion brings on death due to effects of blunt chest trauma. A high likelihood of painful rib fractures or even flail chest would lead to inefficient respiratory mechanics. Hemothorax from intercostal arteries lacerated by shards of bone, and transudative pleural effusion from contused

muscles, further embarrass respiratory mechanics (Edwards et al. 1986; Zugibe 1988). Larger amounts of force could have led to pulmonary contusions and haemorrhage, which as edema progresses, increasingly impair oxygenation. In any case, the likelihood is great that even were the patient removed from the cross with an intact mental status and protecting his airway, the nature of his multiple injuries would necessitate endotracheal intubation and mechanical ventilation with 100% oxygen and PEEP.

Lastly, the concept of shock as the cause of death is one that must be examined. Ongoing studies done by Dr. F. Zugibe (Zugibe 1988) in which healthy medical student volunteers were suspended on a cross, while monitoring of labs, vital signs, and cardiopulmonary statuses were continuously performed, found no significant impairment of respiratory function. However, with the above study findings in mind, after a victim survives the scourging, dehydration, and continuing blood/fluid losses, the idea that shock is indeed the primary cause of death must be entertained (Zugibe 1988).

If one assumes that this patient has airway and breathing secured by prehospital emergency medical personnel, the resuscitation would move next to circulation. Discussion of this phase of resuscitation requires entertaining several scenarios of the nature of the patient's demise. The spear thrust to the side brings a new wrinkle into this patient's evaluation. The sharp objects and bone breaking effects of scourging may indeed have led to hemothorax and indeed it may have been a progression to a tension pneumothorax which led to this patient's death. Were one to see this patient in shock prior to the spear thrust, it would not be unreasonable to empirically undertake needle decompression of both lungs, with subsequent bilateral chest tube placement, particularly if positive pressure ventilation were to be instituted. Respondents should attempt to secure at least two peripheral large bore IV's so as to begin rapid fluid and blood product administration to replace blood loss from flayed tissues and plasma loss from edema and insensible losses due to environmental exposure. In this case, however, there is also known penetrating chest trauma which, whilst it would effectively

decompress a right tension pneumothorax, must also be assumed to have hit major thoracic vessels and potentially the heart itself (Stern & Bobek 2001; Colucciello & Ferrera 2001).

The sudden loss of vital signs following penetrating chest trauma, if it occurs within 5–10 min of medical care is an indication for an emergent thoracotomy or "cracking the chest". One could not know for certain if this patient was truly dead at the time of this injury or simply moribund due to the lethal, though potentially reversible, processes discussed above. The goals of emergent thoracotomy are simple: to identify life threatening injuries and address those injuries in such a fashion that will allow patients to survive until definitive surgical care is available. Whether undertaken in the field, as some helicopter EMS programs have done, or immediately on arrival at the ER, emergent thoracotomy is a drastic exercise in playing the odds: what killed the patient and what is correctable. First a long incision is made in the left lateral chest, the ribs retracted and the lung "pushed aside." The mediastinum and pericardium are identified and the pericardium incised, allowing access to the heart itself. If the injury occurred some time before arrest, one may expect clot or fresh blood from a penetrating cardiac injury to cause tamponade, and such clot should be evacuated. If there is a penetrating cardiac injury, it should be oversewn or stapled quickly, and cardiac resuscitation, such as defibrillation or manual cardiac compressions, performed as indicated. Lacking vascular access, fluids or blood may be infused via IV tubing placed directly into either the right atria or the aorta. Provided there is no such injury, the clinician may then cross-clamp the descending aorta on the odds that distal aorta has been transected and is a source of exsanguination. Resuscitation still being unsuccessful, the clinician may lastly convert to a right-sided thoracotomy to assess whether significant vascular injury, such as to the pulmonary arteries or veins, has occurred and cross-clamp the pulmonary vessels as needed. If these aggressive measures fail to yield any result, resuscitation attempts have failed and should be terminated (Stern & Bobek 2001; Colucciello & Ferrera 2001).

In conclusion, what specifically was the cause of this patient's death? One cannot know for certain, but traumatic hypovolemic shock, respiratory failure from pulmonary contusions and effusions, asphyxia, myocardial infarction, cardiac tamponade, as well as penetrating chest trauma have all been postulated as the "cause of death". Prior research has often focused on the single cause of death in crucifixion victims, but more likely, it truly was multifactorial; multiple blunt, and occasionally penetrating trauma, which led slowly to death by this mechanism (Edwards et al. 1986; Zugibe 1988).

Summary of crucifixion of Jesus Christ cause of death theories

Shroud and Talmage (1874) – spontaneous cardiac rupture
Cooper (1883) – cardiac rupture
Bennett (1887) – rupture of heart due to agony of mind
LeBec (1925) – asphyxia
Whitaker (1935) – cardiac rupture
Hyneck (1936) – asphyxia
Bergsma (1948) – cardiac rupture and massive myocardial infarction
Moeder (1949) – asphyxia
Primrose (1949) – Jesus Christ didn't die, "somatic activities having been maintained at a very low level", after apparent death, he recovered in the tomb
Smith (1950) – heart failure due to shock
Barbet (1953) – asphyxia and pericardial eusions
Judica (1954) – asphyxia and traumatic pericarditis
Bucklin (1958) – asphyxia, pleural eusions, and congestive heart failure
Cameron (1960) and Rendle-Short (1960) – acute fatal dilation of stomach due to shock
DePasquale and Burch (1963) – asphyxia
Tenny (1964) – traumatic shock
Davis (1965) – blood loss, intense fatigue, partial asphyxia, fluid loss, pericardial eusion, shock, and heart failure
Tzaferis (1970) – asphyxia
Wilkinson (1972) – voluntary surrender of life
Lumpkin (1978) – asphyxia, heart failure, pericardial eusion, and shock

Johnson (1978) – stresses of crucifixion and fatal cardiac arrhythmia
Wedessow (1978) – myocardial infarction and cardiac rupture
Zugibe (1984–2002) – shock
Edwards et al. (1986) – hypovolemic shock, exhaustion asphyxia, acute heart failure, fatal cardiac arrhythmia, cardiac rupture due to hypoxia/hypovolemia/altered coagulation state, and/or friable vegetation on cardiac valves with subsequent embolization and myocardial infarction/rupture
Ball (1989) – traumatic cardiac rupture and exhaustion asphyxia
Lloyd-Davies & Lloyd-Davies (1991) – Jesus Christ didn't die, syncope due to shock
Jackson et al. (1995) – asphyxia, dehydration, hypovolemia and acidosis
Houloubek and Houloubek (1995) – asphyxia and shock
Bollone (1999) – myocardial infarction
Wiels (2001) – acidosis/asphyxia

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