Case Study

Hemorrhage Control

TO BLEED, OR NOT TO BLEED, THAT IS THE QUESTION!

>> BY BRENT BRONSON, NREMT-P

Pre-hospital health care providers are called upon to address and treat many different types of traumatic injuries. From minor abrasions, as seen on the child patient who fell off of their skateboard, to the complex, multi-system injuries of the victim struck by a car while walking across the street. Each of these traumatic injuries has unique and specific treatment modalities.

Significant injuries require pre-hospital health care providers to think beyond conventional hemorrhage control techniques to effectively manage bleeding. Some protocols discuss the use of direct pressure, elevation, pressure points, hemostatic agents and tourniquets; however many do not address wound packing for penetrating injuries. The American College of Surgeons Committee on Trauma in the current PHTLS manual no longer recommends the use of elevation and pressure points because of insufficient data supporting their effectiveness.

Pre-hospital providers are taught to control bleeding by applying direct pressure. This maneuver successfully controls most bleeding that we encounter and should be the first step taken in all hemorrhage control techniques. In cases of profuse extremity bleeding, a tourniquet is a valuable tool that can be utilized to stop bleeding.

Statistical data and multiple studies from the military have conclusively dispelled the misconception that temporary tourniquet use is a hemorrhage control technique "of last resort."

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In fact, when applied appropriately, liberal tourniquet use has prevented morbidity and mortality and these devices should be implemented within civilian EMS treatment protocols.

One type of injury that can be both difficult and challenging to address in the field is a penetrating injury that creates a wound cavity with arterial hemorrhage. While it is true that the first step in controlling profuse bleeding is to apply immediate direct pressure to the wound site, in penetrating wounds where a wound cavity or wound bowl is present, direct pressure alone may not control bleeding. In this case, aggressive and thorough packing of the wound cavity is essential in gaining hemostasis. Packing of wounds with gauze fills the void space in the cavity and creates an internal bandage which applies pressure to the injured vessel. Protocols for hemorrhage control must include wound packing for injuries with wound cavities when direct pressure does not control bleeding or when the wound is located in a non-compressible area such as the groin, axilla, neck, or clavicle area.

To properly pack a wound, the pre-hospital health care provider should continue to apply direct pressure to the wound site while preparing the rolled gauze to insert into the wound cavity. Once ready, the provider begins packing the gauze into the wound cavity to fill the void areas. Some clinicians utilize a circular pattern going clockwise working from the outside in; others prefer to insert the gauze in an up, down, left, then right pattern to fill the wound cavity. The size of the wound cavity will determine the amount of gauze to insert. The purpose of packing a wound is to fill the complete wound bowl area with gauze. This material creates a mechanical pressure on the actual injured vessel to help in clot formation. The wound should be aggressively packed until the entire wound cavity is filled. Any remaining gauze is placed on top of the wound site and then a proper pressure bandage should be applied in order to maintain constant direct pressure on the injury site.

Some agencies have included the use of hemostatic agents in their protocols. Hemostatic agents can be truly life saving tools when applied properly to an injured vessel. Unfortunately, many providers neglect the important component of packing the wound cavity before and after the hemostatic agent has been applied. None of the currently available hemostatic agents are intended to be "stand alone" interventions. When utilizing hemostatic agents, penetrating injuries that have wound cavities should be treated by packing the wound with gauze both before and after the application of the hemostatic agent.

In conclusion, the treatment of serious bleeding begins with the basics of direct pressure and conventional bleeding control measures. If these measures do not work, alternative hemorrhage control techniques must be used to prevent the loss of the blood. Direct pressure, pressure bandages, and the use of tourniquets are commonly taught to pre-hospital care providers. One technique that is not commonly seen or universally understood in pre-hospital protocols is wound packing. Don't deny yourself the tools or training that might be required to save a life. Understanding the physiology of penetrating injuries, as well as how to properly apply sound hemorrhage control techniques, will reduce preventable mortality rates.

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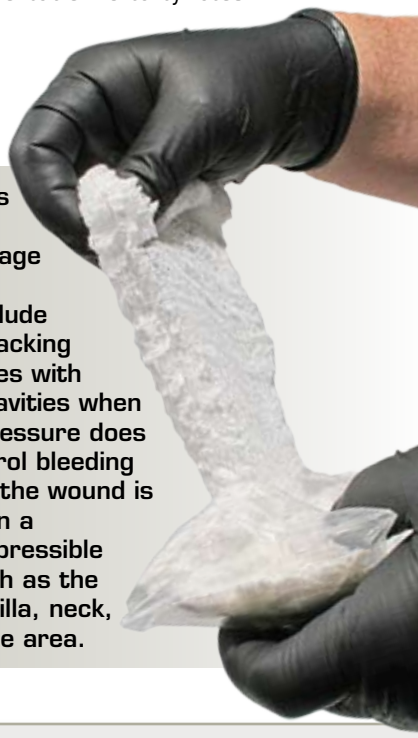

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