

To Tourniquet or not to Tourniquet... That is the question?

Is it not amazing how certain treatments fall in favour, then out and then back in again? I imagine that when most of us were trained you were taught to err on the side of omission when it came to applying a tourniquet. Effectively, patients would need to be banging on the doors at the Pearly Gates before someone would say, "Hmmm maybe we should try a tourniquet..."

So why were we so jumpy when it came to the application of tourniquets in the good 'ol days? Well from personal experience in my early days as an emergency care provider (which was in the late 80's), I remember my instructor telling me. "Your patient will lose his/her limb". I remember asking, "Wouldn't it be better to lose a limb than almost your entire blood volume and then your life?" The answer seemed to be in favour of the latter. Now of course this is no reflection on the educator of the day, because the teachings were based on the information that was available at that time. We had no major wars to gather evidence from (which I suppose is good and bad). When peace started going pear-shaped in the Middle East, with mass casualties and some nasty limb injuries (studies began to emerge showing that around 44% of patients who died in the field were as a result of extremity trauma), military medical units had to develop a different set of rules to save lives. And so the age of the tourniquet reappeared with great success. So how different is the combat environment to a regular Friday night in Cape Town or Johannesburg EMS? Sadly, not very different at all and with that goes a different set of rules.



The Real Deal

Strangely, many of the medics I come into contact with on a daily basis are still favouring the approach of "as a last resort." The million dollar question is, "When does the last resort period start?" Is it just prior to the patient acquiring their harp to begin life outside this world? Or is it when we decide that the patient has a potentially uncontrollable arterial bleed and would benefit from the application of a tourniquet sooner rather than later? I have seen them work, so I am a firm supporter in their use. I also believe that EMS services should be playing a more active role in equipping their crews with this life-saving device. The Philadelphia Police Department recently issued over 5000 tactical tourniquets to their police officers and already there are numerous reports of patients surviving injuries that would no doubt have resulted in the loss of their lives before the tourniquet initiative was implemented. So, the police department

is taking the lead where EMS should be setting the standard...

Most tourniquets been used in EMS in South Africa are makeshift and mainly consisted of some form of bandage being twisted around the extremity and held in place by the provider's hands. Trust me; this is no easy feat at all. In fact, it is really difficult to get any form of pressure to stop flow from the artery. In addition to this, the bandages that were most often used were rather narrow in width and as a result a very narrow margin of pressure was applied to the extremity. We know now that with tourniquets, it is effectively only the medial section of the band from which the majority of pressure is applied. A true tourniquet (to stop arterial haemorrhaging) should not be confused with the stretchy nylon types we use to site peripheral IV's. They are simply not designed to stem large volume bleeds. They really are only suitable for engaging peripheral veins to site an IV cannula.



Not The Real Deal

Which is the best option and how do we apply it?

Elimination of distal artery flow is the fundamental purpose of a tourniquet. Any tourniquet that cannot stop arterial blood flow is simply ineffective. One precursor to the tourniquet was the use of tight bandages placed proximal to the point of a traumatic amputation. Most commercially manufactured tourniquets are designed for quick application, usually within 60 seconds. A tourniquet replaces the need for direct pressure, additional bandages or a second care provider during transport. An appropriately trained emergency care provider should be able to effectively stop extremity haemorrhage, accomplish multiple interventions and initiate immediate transport without the need for additional emergency personnel.



Applying



Tensioning

Currently, most medics are trained to place the tourniquet just above the sight of the injury while avoiding placement over a joint. Placing the tourniquet more proximally to the injury on the thickest portion of the extremity helps to limit damage to the underlying tissue and prevent any minor bleeds near the injury. Once positioned, tourniquet tensioning requirements will increase with the size of the limb. The pressure required to halt arterial blood flow is inversely proportional to the width of the tourniquet. Complete occlusion of arterial flow on the lower extremities is extremely difficult, if not impossible, with a 25mm wide tourniquet. A wider tourniquet will be more effective on a lower extremity, as there is less pressure needed on the

greater surface area to successfully occlude arterial blood flow, and less tissue damage will occur .

Most purpose designed tourniquets have a width of around 50mm and make use of a windlass or ratchet type tensioner to achieve the effects of arterial occlusion. Many, such as the Rotation Compression Tourniquet also have a buckle for single hand and dual hand application as well as a Velcro securing strap for extra anchoring. Once the required effect is achieved, the windlass of the tourniquet should be placed in a docking system so as to avoid it unravelling and releasing the tension initially achieved.

How tight should it be applied? Well the best guide is to look at the haemorrhage site while tensioning up the tourniquet. When haemorrhaging stops, you have achieved enough tension .



Securing

How long should it be applied for?

Emergency care providers are cautious when it comes to the use of tourniquets because prolonged use can lead to neurovascular damage and tissue death. We know that tissue death from impaired circulation can occur in as little as two hours.

We also know from studies that tourniquets have been left on for over 16 hours without any notable harm.

In the emergency medical service setting, there is a huge focus on response times, limiting scene time and relatively short transfer times to a medical facility. In these instances, it is relatively safe to allow the tourniquet to remain in place until handover to the emergency team at the receiving hospital. It is crucial however to note the time of application. Most purpose-designed tourniquets will have a white tag on which the emergency care provider can note the time of application.



Placing a 'T' on the forehead of the patient by means of a surgical pen is also a great way of reminding staff that a tourniquet has been applied.

Releasing a tourniquet has its own risks and there are circumstances where removal never makes sense. These later would include limb amputation, shock, and the inability to monitor the wound or continued bleeding. Intermittently releasing them to temporarily restore circulation has been reported to lead to unrecognised, ongoing blood loss and patient death. On a long evacuation, if the conditions seem otherwise safe, waiting 1 hour before attempting release seems like a reasonable time interval. If bleeding starts again, re-secure, note the time and leave it in place.

In conclusion

I believe that tourniquets should be standard issue on all EMS units. Be safe Paramedical has taken the step of adding a Tactical Tourniquet to all our jump bags as well as our IFAK (Individual First Aid Kits) as a general standard. One simply has to look around at how tourniquets are saving lives to realise that there is no excuse for not having one. This is particular true if one is a professional healthcare provider.

A shark attack which took place in Cape Town a little while ago made headlines around the world because the two elderly gentlemen who rescued the victim, applied a tourniquet to both limbs soon after they got him onto dry sand. There is no doubt that this was the single biggest factor in saving his life. A patient with no blood volume on arrival at a medical facility is inoperable. You cannot replace blood on a scene; however you can limit its loss and give the patient a fighting chance and the surgeons something to work on.

Give us a call or drop us an email at Be Safe Paramedical and you would be extremely surprised at just how cost-effective our Rotation Compression Tourniquet is (the device used in the pics in this article). I challenge you to put one in every jump bag and on every EMS vehicle in your service. I guarantee the results will be phenomenal....

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