



Trauma Notes

Summer Issue ▪ August 2011

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New Advances in Orthopaedic Trauma

Although fractures of the clavicle have been generally successfully managed conservatively since time began, new research including retrospective reviews and randomized prospective studies have suggested that healing rates and functional outcomes from conservative non-operative treatment may not be the best choice in some cases.

This has led to a re-thinking of the old doctrine that the clavicle "will heal if the two ends of the bone are in the same room together." If there is a straight-forward 2 part midshaft fracture with reasonable side-to-side apposition and no skin compromise, particularly in a younger person this injury can be treated conservatively

with the expectation of a good result.

However, if there is a wide displacement or comminution with a vertically-tilted central fragment, skin compromise, or a distal fracture, many orthopedic surgeons now recommend operative fixation. These can still be problematic fractures but the results generally seems to be better operatively. The advent of specialized low profile plates have also lessened the chance of symptomatic hardware and the need for later removal.

So, if you are presented with a clavicle fracture of this variety, consider getting an orthopedic opinion.

Article by Dr. Tim Olmstead



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Changing Attitudes: Tourniquet Use in Exsanguinating Extremity Injuries

Tourniquet use has a long history related to warfare going back hundreds of years. Etienne Morel, a French surgeon, was the first to write about control of hemorrhage with a tourniquet. Prior to this, tourniquets had been used as an aid to prevent blood loss during amputation as early as 1517. Jean-Louis Petit modified the tourniquet, introducing a windlass (a stick) to tighten, and is believed to have introduced the term “tourniquet”. Lister was the first to use the tourniquet in civilian practice to produce a bloodless field during surgery in 1874.¹

Recent military data suggests that 10% of deaths on the battlefield are caused by extremity hemorrhage and 60% of preventable deaths may be caused by extremity hemorrhage. In Vietnam, 7% of deaths were preventable by use of a tourniquet.²

Tourniquets in civilian pre-hospital care is discouraged mostly due to fear of preventable injury resulting in neurologic injury or unnecessary amputation. ATLS discourages use of tourniquets; however, there is a statement, “The use of a tourniquet to control bleeding may be of benefit in select patients.”³

The challenges with tourniquets in a civilian environment are several. Firstly, hemorrhage may be controlled with direct pressure and proper application of a pressure bandage. Secondly, a tourniquet used for more than 2 hours can result in nerve or tissue damage, especially if it is narrow and applied too tightly.

Safe tourniquet application time is uncertain, but more than 2 hours may cause a compartment syndrome requiring a fasciotomy. Improper application, at lower pressure than the systolic blood pressure, often increases bleeding rather than controlling it. Lastly, the application results in ischemic limb; usually associated with extreme pain and agitation during resuscitation.

With recent conflicts in Iraq and Afghanistan and the use of modern body armour, there seem to be an increased number of severe extremity injuries resulting in mangled limbs. Tourniquets used in the field are applied by military medics, often under fire, in the dark and/or in very austere conditions.

Tourniquet use in Afghanistan was relatively common in exsanguinating hemorrhage from extremity injuries. Even patients with bilateral lower limb amputations would arrive with their hemorrhage being controlled and the patient relatively resuscitated.

The indications for tourniquet use in civilian environments are limited. However, there are situations in northern BC similar to Afghanistan; a

large geographic area with a limited number of surgeons, coupled with the potential for severe and mangled injuries in forestry and mining. Transporting patients to surgical treatment is often delayed for hours. For a patient with a traumatic amputation or multi-level injury with significant vascular injury, the application of a tourniquet could be life saving.

The use of a tourniquet has been discouraged; no tourniquet devices are carried by the ambulance paramedics in northern BC.⁴ Emergency rooms and ambulances, however, carry blood pressure cuffs which can be used as a tourniquet. This device has some advantages as its wide based and less likely to cause local tissue damage. Once applied, the patient must be moved rapidly to hospital for surgical treatment. During resuscitation, the limb needs to be observed to ensure no recurrence of bleeding once blood pressure begins to rise; usually it becomes obvious the patient will require analgesic.

It was formerly recommended the tourniquet be loosened every half hour allowing gradual reperfusion of the limb; however, this approach often resulted in further bleeding and shock. Currently, it is believed wiser to focus on rapid transport to definitive care.

In conclusion, there are situations in the north where tourniquet use may be life saving.



*Article by Dr. Brian Dubois
Maj. Retired CAF*

Temperature: The Forgotten Vital Sign (part two)



The main clinical assessment for hypothermia is temperature measurement, with several options available. A current practice at UHNBC Emergency Department is the use of a thermistor tipped Foley catheter. A more immediate and non-invasive measurement such as tympanic may be required. Regardless of the route, a consistent method is important in monitoring temperature and the response to therapy.

Many methods are available for maintaining and increasing temperature in the trauma patients. Passive external warming is used to preserve body heat and prevent its loss. This is achieved by removal of wet clothing, provision of warmed blankets and a warm resuscitation room, avoiding unnecessary

exposure, coordinating assessment and care, ensuring the patient is free from drafts, and restricting room traffic.

Active external and internal re-warming methods are used to treat mild (34 - 36 °C) to profound (< 30° C) hypothermia. Examples include warmed flannels, air convection blankets such as Bair Hugger, and radiant heat lamps. Common internal methods include warmed intravenous fluids, internal irrigation of body cavities with warmed fluids, and intravascular re-warming through venous or arterial means.

Consider the current practice in your department; do you have strategies to address hypothermia in the trauma patient?

Article by Ms. Cheryl Dussault RN

Tranexamic Acid (TXA) for Trauma

Approximately one third of hospital deaths in trauma are attributed to hemorrhage. Antifibrinolytic drugs have been studied in elective surgery with mixed results. Tranexamic acid (TXA), an aminoacid derivative, inhibits fibrinolysis by blocking the lysine receptors on plasminogen. TXA fell out of favor for subarachnoid hemorrhage in the 1990's. It reduced bleeding but the benefit was offset by an increase in cerebral ischemia.

BC Ambulance Service has recently

decided to have critical care paramedics administer TXA to patients with trauma and life threatening bleeding. This follows a recent study (CRASH-2) involving 20,000 patients with, or at risk of severe bleeding. TXA was found to safely reduce the risk of death. The magnitude of the benefit was small



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direct hemorrhage control

but significant (1.5% were helped by preventing death) and none were harmed. No vascular occlusive events were noted.

TXA is administered as a 1g bolus over 10 minutes followed by an infusion of 1g over the following 8 hours. It is inexpensive, has demonstrated no adverse effects, and should be considered in trauma patients with hemorrhagic shock or a high risk of bleeding.

Article by Dr. John Ryan

Northern Trauma Accreditation

We are excited to announce that Northern Health is seeking national accreditation for its regional trauma service. The Trauma Association of Canada (TAC) will be visiting NH in

November 2011. We look forward to working with our colleagues across the north to strengthen our regional trauma system as we prepare for the TAC accreditation team visit.

“Bringing together those involved in the care of the injured patient to promote the highest standard of patient care, education, organization, and research in the field of injury”

Injury Prevention: Swimmers Have A Word With Yourself!

“Before you think only other swimmers drown, have a word with yourself.” This is the latest drowning prevention campaign slogan from Preventable.ca. While summer seems to have passed right over BC, we still need to take a moment to think about staying safe around water.

According to Vital Statistics, there are at least 60 deaths in BC each year due to drowning and water-transport-related activities.

These prevention tips will help keep water play safe and fun:

- ✧ Supervise your baby at all times.
- ✧ Be your child’s lifeguard! Adult supervision at all times keeps children safe in, on and around water.
- ✧ Enroll your children and yourself in swimming lessons.
- ✧ Build a 4-sided fence around all pools, including inflatables, with a self-closing / self-latching gate.
- ✧ Remove toys in the water or near



the pool’s perimeter; these can tempt children to water’s edge.

- ✧ Get trained in First Aid and CPR.
- ✧ Never underestimate the power of currents. Be cautious swimming in open water and currents. Know what to do if caught in a current.
- ✧ When boating, ensure everyone is wearing their own properly fitted and fastened lifejacket.
- ✧ Alcohol and water fun don’t mix! Don’t consume alcohol before or during swimming or boating activities.

Visit www.northernhealth.ca (Your Health/Injury Prevention) for more info about preventable injuries and water safety.

Article by Ms. Denise Foucher



UPCOMING TRAUMA EDUCATION

ACLS Provider
(ADVANCED CARDIAC LIFE SUPPORT)
September 17th & 18th, 2011

ACLS Recertification
(ADVANCED CARDIAC LIFE SUPPORT)
October 22nd, 2011

ENPC
(EMERGENCY NURSING PEDIATRIC COURSE)
Sept 30th - Oct 2nd, 2011

TNCC
(TRAUMA NURSING CORE COURSE)
November 2011

ATLS
(ADVANCED TRAUMA LIFE SUPPORT)
June 2012



References

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- ² Lakstein, D. *Tourniquets for Hemorrhage Control on the Battlefield: A 4-Year Accumulated Experience*. Journal of Trauma 2003, Vol. 54, supplement 5, pgs 221-225
- ³ American College of Surgeons, ATLS Manual 8th Edition, pg 193
- ⁴ Personal communication, Dr. John Ryan, Medical Director for BCAS, Prince George

THANK YOU to all participating authors for their generous contributions of time and expertise. THANK YOU to Cimos and North 54 for their generous donations and to Dr. William (Bill) Simpson for his ongoing efforts coordinating this great sponsorship. The winner is.....**Dr. Devin Spooner**"
Blunt Cerebrovascular Injuries: April 2011 Issue!!!

FOR CONTACT INFORMATION VISIT

Northern Trauma Services Website:

<http://portal.northernhealth.ca/Browse/NHT/default.aspx>