

Utilization of Traction Splints with Open Femur Fracture

This statement is not a replacement for compliance with local protocol or direct instruction from medical control.

The question of whether it is permissible to use a traction splint to manage an open mid-shaft femur fracture was posed to the ITLS Editorial Board by an instructor in the organization.

In response a literature review on the topic was performed. No Class 1 evidence was found to support the use or non use of this device in the above mentioned clinical situation. Only one consensus document from the wilderness rescue literature was located

Among the recommended methods for stabilization of midshaft femur fractures is the use of a traction splint. Based on observational studies, with the proper application of traction, the broken ends of the bone move less, decreasing hemorrhage and patient pain. It should be stressed that traction splints should not be used in either proximal or distal femur fractures due to the propensity of the device to cause movement of the hip or knee, increasing the risk of complications (1).

Among the tenets of field management of fractures is the principle that when there is an open fracture, the provider should not allow the bone ends to retract back into the open wound during stabilization, as contaminated material can be carried into the wound, increasing the risk of infections such as osteomyelitis. The adage has been that open fractures should be “splinted as they lie”. In the presence of neurovascular compromise, the fracture can be manipulated to allow for restoration of pulses distal to the fracture.

As the longest and strongest bone in the body, it takes a lot of force to cause a femur fracture. Thus the presence of a fractured femur suggests a high energy injury and that the patient is at risk for multiple injuries such as internal bleeding, head injury or additional fractures. Isolated femur fractures are relatively rare in healthy adults. so that a femur fracture is a potential marker of high force injury. Emphasis is placed on rapid transport of multi-trauma patients, shortening the time to definitive care. In urban situations with short transport times, application of traction splints for femur fractures (open or closed) is likely not to impact patient outcome.

Original use of the traction splint, first popularized by Dr. Thomas during the First World War, included the use of the device for femur fractures resulting from gunshot wounds, which by definition are open fractures. This recommendation is carried over to modern day combat wounds (2, 3)

Given that ALL OPEN FRACTURES are contaminated and subject to infection and will need to undergo wash-out and / or debridement by an orthopedic surgeon, we believe that application of a traction splint in the austere environment to either open or closed fractures benefits the patient. Copious irrigation, preferably in route, should be performed prior to reduction to reduce foreign material in the wound. If available, appropriate antibiotic therapy should be initiated and the fact that the fracture was open and reduced by EMS personnel must be conveyed to the receiving facility.

Recommendation:

For patients in isolated or austere environments, where transport to definitive care is substantially delayed, application of a traction splint after stabilization of life threatening injuries can improve patient comfort and reduce possibility of neurovascular injury.

References:

1. <http://www.haretractionsplint.com/history.htm>
2. Melamed E et al, Prehospital Care of Orthopedic Injuries, Prehospital and Disaster Medicine, 22:21, 2007
3. Rowlands T and Clasper J The Thomas Splint – A Necessary Tool In The Management Of Battlefield Injuries R Army Med Corps 2003; 149: 291-293
4. Bledsoe, B and Barnes, R Traction Splinting, JEMS August 2004, page 64