Prevention of Thromboembolic Complications in Injured Patients

American College of Surgeons Committee on Trauma
June 1998
Incidence:
Posttraumatic deep venous thrombosis (DVT): 10%–20%
Posttraumatic pulmonary embolism (PE): 1%

Complications:
Permanent postphlebitic syndrome, including pain and swelling
Chronic venous insufficiency
Respiratory failure and/or death secondary to PE

Trauma Risk Factors for Thromboembolism:
Age >40 years
Pelvic/femoral/tibial fracture
Venous injury
Femoral venous catheter present >24 hours
Severe closed head injuries (Glasgow Coma Scale score <8)
Anticipated need for prolonged immobilization (>3 days)

Medical Risk Factors for Thromboembolism:
Age >50 years
Obesity
Previous history of DVT
Pregnancy or recent postpartum state
Malignant disease
Hypercoagulable state (antithrombin, protein C/S deficiency)
Recent myocardial infarction/congestive heart failure

Diagnosis:
Note: Most episodes of posttraumatic thromboembolism are clinically silent!

DVT: Color-flow duplex sonography (CFD); see the Figure
Venography only when CFD is inconclusive

PE: Pulmonary angiography
Ventilation/perfusion scans rarely helpful in trauma patients

Prevention of Thromboembolic Complications in Injured Patients

M. Margaret Knudson, MD, FACS

Example of CFD scan showing acute DVT in the iliac vein. Note the adjacent iliac artery.

*a. General indications for trauma patients over the age of 18 years. Although children are generally considered at low risk for thromboembolic complications, older teens with paraplegia should also be considered candidates for prophylaxis.

*b. The current contraindications to anticoagulation after trauma include head injury with intracranial hemorrhage; unstable spinal cord injuries; uncorrected coagulopathy; ongoing hemorrhage; known heparin allergy; or the use of an epidural catheter for analgesia or anesthesia.

*c. Anticoagulants may include low molecular weight heparin (LMWH; molecular weight around 5,000 daltons given subcutaneously every 12 hours); adjusted-dose unfractionated heparin given intravenously or subcutaneously; or low doses of sodium warfarin (Coumadin). While subcutaneous heparin (5,000 units every 12 hours) appears to offer no protection in the trauma patient, LMWH has been shown to be both safe and effective in preventing posttraumatic thromboembolism. Currently, there are no data on the use of combined mechanical and pharmacologic prophylactic methods in injured patients. All methods of prophylaxis should be initiated within 36 hours of injury.

*d. CFD = Color-flow duplex sonography.