

Incidence of Complications After Therapeutic Anticoagulation in the Postoperative Spine Trauma Patient

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Background: There have been numerous studies on prophylactic anticoagulation after spinal surgery but none have investigated the risks of therapeutic doses of anticoagulation indicated for the treatment of a thromboembolic event such as PE (pulmonary embolism), DVT (deep venous thrombosis), or MI (myocardial infarction). The incidence of complications secondary to initiation of therapeutic anticoagulation, including spinal epidural hematoma, has yet to be established.

Methods: A retrospective cohort study was conducted using prospectively collected data at a Level I trauma center. Patient selection criteria included those who: (1) underwent spinal surgery and (2) sustained a symptomatic PE, DVT, or MI thus requiring the initiation of therapeutic anticoagulation. Patients were excluded if: (1) the thromboembolic event was sustained before spinal surgery or (2) anticoagulation was subtherapeutic. Of 1712 patients who underwent spine surgery at our institution from 2001 to 2014, 63 patients met these criteria. A control group of 63 operative spine trauma patients who did not undergo therapeutic anticoagulation were obtained and compared. Logistic regression models were used to evaluate the association between covariates of interest and odds of reoperation.

Results: Initial anticoagulation was obtained by heparin infusion, LMWH (low molecular weight heparin), and warfarin in 32 (50.7%), 29 (46.0%), and 2 (3.2%) patients, respectively. After postoperative initiation of therapeutic anticoagulation, 11 (17.5%) patients sustained complications requiring unplanned reoperation with 10 of 11 patients returning within the first 26 days compared with 4 (6.3%) patients in the control. Two (3%) patients underwent re-exploration due to the development of epidural hematomas after therapeutic anticoagulation compared to 0 patients in the control group. Patients required reoperation for indications including wound infection, hemorrhage, and pseudarthrosis. In addition, the initial use of a heparin infusion compared to LMWH demonstrated a 13.3-times higher odds for reoperation due to a spinal surgery complication and a 17.9-times higher odds for reoperation for any reason in our multivariate model.

Conclusion: This represents the first attempt to quantify complications secondary to therapeutic doses of anticoagulation after spine surgery. We found a nearly three times higher rate of complications requiring reoperation in the therapeutic anticoagulation group compared to the control group (17.5% vs 6.3%). Surgical decompression for epidural hematoma was required in 3% of anticoagulated patients versus 0% in our control group. Furthermore, our data suggest that initial anticoagulation using a heparin infusion compared to LMWH may increase the rate of reoperation.