Thrombolytic Therapy in a Patient with an Epidural Catheter

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Introduction
The ability to provide comfort and relieve pain during the postoperative period is a priority in the care of the surgical patient. Epidural anesthesia is widely used to manage postoperative pain. The epidural infusion of local anesthetics combined with opioids provides excellent pain relief. It also reduces intra- and postoperative narcotic requirements, leading to earlier mobilization and faster discharge. However, epidural analgesia carries risks for the patient. This presentation reports on the risk of treating a patient with thrombolytics while receiving epidural analgesia.

Thrombolytics are used to treat life threatening thrombus. The three main types of thrombolytics are streptokinase, urokinase, and tissue plasminogen activator (tPA). Their mechanism of action is through converting plasminogen to plasmin, promoting clot lysis via breakdown of fibrin. The literature supports the use of thrombolytics for a large pulmonary embolus causing life-threatening hypoxemia and hypotension as a life saving measure. The administration of tPA can dissolve the thrombus, restoring vital organ function and hemodynamics. However, the recommendation is to administer with caution and weigh the benefits and disadvantages on a case-by-case basis. Lobato et al. stated that epidural or lumbar puncture prior to use of thrombolytics is a relative contraindication.

Case Report
A 50-year-old male scheduled for an abdominal hernia repair requested epidural analgesia to manage post-operative pain. The epidural catheter was placed at the thoracic 6-7 interspace with an 18 gauge Tuohy epidural needle from the paramedian approach on the first attempt. Intraoperatively, an epidural infusion of 0.1% bupivacaine and hydromorphone 20 mcg/mL was started at a rate of 6 mL/hr. He was evaluated in the recovery unit and found to have good pain control.

The patient continued to be pain free with a progressive decrease of the epidural infusion to 4 mL/hr. The plan was to remove the epidural catheter once he began to drink liquids, pass flatus, and ambulate. However, while performing his morning walk on his 5th day, he had a syncopal episode. He was found to be in respiratory distress, hypotensive, tachypneic, tachycardic, and hypoxic. An EKG showed right heart strain consistent with a pulmonary embolus. The epidural catheter was removed within 30 minutes of the syncopal episode and the primary team was advised to delay heparinization for one hour, consistent with ASRA guidelines. CT scan and echocardiography found a large saddle embolus in the pulmonary artery resulting in a severely enlarged akinetic right ventricle with severe reduction in right systolic function. An IVC filter was placed and the pulmonary team recommended tPA followed by heparin. After administration of thrombolytics, the patient became hemodynamically stable. However, there was concern among the pain management team because of limited literature on the use of thrombolytics following removal of a thoracic epidural catheter. A prompt neurologic examination was performed following tPA. The examination was unremarkable but we continued to perform hourly neurologic examinations over the following day and every 4 hours thereafter. In addition, twice daily examinations were performed of the epidural site. During that period, the patient had no complaints of pain, pressure, or swelling at the epidural site and denied weakness of his lower extremities and the examinations remained normal.

Other complications of thrombolytics were present. The day after tPA was administered, the patient was anemic and required 11 units of blood transfusions. On day 4, he was diagnosed with an abdominal hematoma requiring surgical evacuation. He developed heparin-induced thrombocytopenia on day 8. After these complications resolved, he was discharged home on postoperative day 23 with no neurologic complications.

Discussion
This case illustrates the difficult decisions involved in treating a patient receiving epidural analgesia for postoperative pain who developed a pulmonary embolus. The patient was subsequently given thrombolytics and anticoagulation. The ASRA consensus statement states “there is no definitive recommendation for removal of neuraxial catheters in patients unexpectedly receiving fibrinolytic and thrombolytic therapy during a neuraxial catheter infusion.” The medical literature does not clearly demonstrate mortality benefits after thrombolytic therapy. However, the physiologic improvements resulting from the use of thrombolytics, as occurred in this patient with a large pulmonary embolus, have led clinicians to use it on a case-by-case basis. Unfortunately, the lack of guidance in the literature about when or if to remove an epidural catheter upon administration of thrombolytics and as well as the risks of thrombolytic therapy in patients with an epidural catheter did not provide guidance for catheter removal. Fortunately, this case demonstrated that complications do not always result from removal of an epidural catheter after a patient receives thrombolytics.

Conclusion
The use of thrombolytic therapy and anticoagulation in patients with a life-threatening acute embolic event is on the rise. The anesthesiologist should have a well thought plan and protocol that includes neurologic monitoring, availability of spinal imaging, patient transport and neurosurgical consultation in the event thrombolytics are given to a patient with an epidural catheter. This case provides an indication that an adverse event is not always the outcome in such situations.

References