



Maintenance of an epidural catheter in the setting of heparin infusion through hepatic artery infusion pump

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Anesthesiology
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Introduction

- 58-year-old male with a history of bipolar disorder, depression, and colorectal adenocarcinoma with metastases to the liver.
- Underwent liver segmentectomy, cholecystectomy, and placement of a hepatic artery infusion pump (HAIP).
- Thoracic epidural placed preoperatively for postoperative analgesia.
- Intraoperatively, the hepatic artery infusion pump reservoir was filled with 30,000 units of unfractionated heparin in 30 milliliters (mL). 19 mL of heparin infused over 14 days.

Materials and Methods

- A risks and benefits discussion was held between the patient, surgical team, and acute pain service team, who was managing the epidural, given that the epidural was in place while the heparin was being infused.
- Decided that the analgesic benefits of maintaining the epidural outweighed the risks of the continuous infusion of heparin which was deemed to be low-risk.
- Small amount of continuous heparin was expected to have a negligible effect on the patient's coagulation status, both the surgical and acute pain service teams agreed that coagulation studies (PTT, PT, INR) should be monitored daily.

Results

- On POD 3, the PTT was elevated at 35.3 seconds; his prior PTT results were between 23.4 – 30.4 seconds.
- The patient was receiving venous thromboembolism prophylactic heparin (5,000 units subcutaneously) three times daily.
- The frequency of the prophylactic heparin was reduced to two times daily on POD 3 based on the elevated PTT.
- PTT was 34.4 seconds on the morning of POD 4 and 32.9. Epidural catheter was removed on POD 4.
- Neurovascular checks were continued every 4 hours for 24 hours after the epidural was removed, and there were no issues.
- The patient has been following up in the oncology clinic every 1-2 weeks without any epidural-related complications.

Day	Preop	POD 0	POD 1	POD 2	POD 3	POD 4 (AM)	POD 4 (PM)
PTT (seconds)	27.1	23.4	27.7	30.4	35.3	34.4	32.9
PT (seconds)	9.8	10.3	10.5	12.2	11.1	10.3	N/A
INR	0.92	0.97	0.99	1.17	1.05	0.97	N/A
Platelet (K/cu mm*)	193	341	309	241	249	270	N/A
*K/cu mm (thousands per cubic millimeter)							

Discussion

- Based on the outcome of this case, we support that maintaining an epidural in a patient with HAIP heparin infusion is safe and reasonable if the patient, surgery team, and anesthesia team determine that the benefits outweigh the risks.
- We recommend that coagulation studies be monitored daily and are within normal limits prior to epidural catheter removal. If coagulation studies are abnormal, providers may consider reducing the frequency of prophylactic subcutaneous heparin as well as completing neurovascular checks at least every 4 hours while the epidural is in place until 24 hours after catheter removal.

References

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- 2.Lewis, H. L., & Bloomston, M. (2016). Hepatic artery infusional chemotherapy. *Surgical Clinics*, 96(2), 341-355.