

Identification of Preoperative Intravascular Epidural Catheters with Epidurograms in a Patient Undergoing Bilateral Wilms' Tumor Resection

Elizabeth Starker, MD, Brian Johnson, DO, Glenn Merritt, MD, Richard Ing, MD, Christopher Ciarallo, MD, Matthew Iacovetto, BS
 Department of Anesthesiology, Children's Hospital of Colorado, Aurora, CO

Introduction

- Epidural catheter placement for post-operative analgesia is a common technique used in children.
- Catheters become non-functional due to failure to place or maintain the catheter in the epidural space. Epidurograms aid in the guidance of safe and efficacious epidural placement and the identification of misplaced catheters^{1,2}.
- Epidurograms add additional risk to the procedure, including increased cost, radiation exposure, or reactions to contrast dye¹. These risks must be weighed against the increased benefit of accurately identifying appropriately placed catheters, especially in a high-risk pediatric population.
- Wilms' tumor is the most common primary renal malignancy in children. Many patients present with large intra-abdominal tumor burden, requiring chemotherapy or other treatment modalities to shrink the tumor prior to resection.

Case

- An 18 month old female with bilateral Wilms' tumor presented for exploratory laparotomy for tumor resection.
- Under general anesthesia, a thoracic epidural was placed in the T9-T10 interspace to loss of resistance technique to saline. Aspiration of the catheter was negative. An epidurogram was performed which demonstrated contrast material in the venous plexus of the T4-T8 region (see Figure 1).
- A new catheter was placed at T11-12. Aspiration of the catheter and a test dose was negative. An epidurogram demonstrated contrast in T8-T9 region, with a possible vascular course. On repeat aspiration, blood was noted in the catheter, leading to catheter removal.
- After tumor resection and abdominal closure, a third epidural catheter was placed at T12-L1. An epidurogram demonstrated no vascular uptake of contrast and test dose was negative. An epidural infusion was initiated and the patient's pain was well controlled postoperatively.

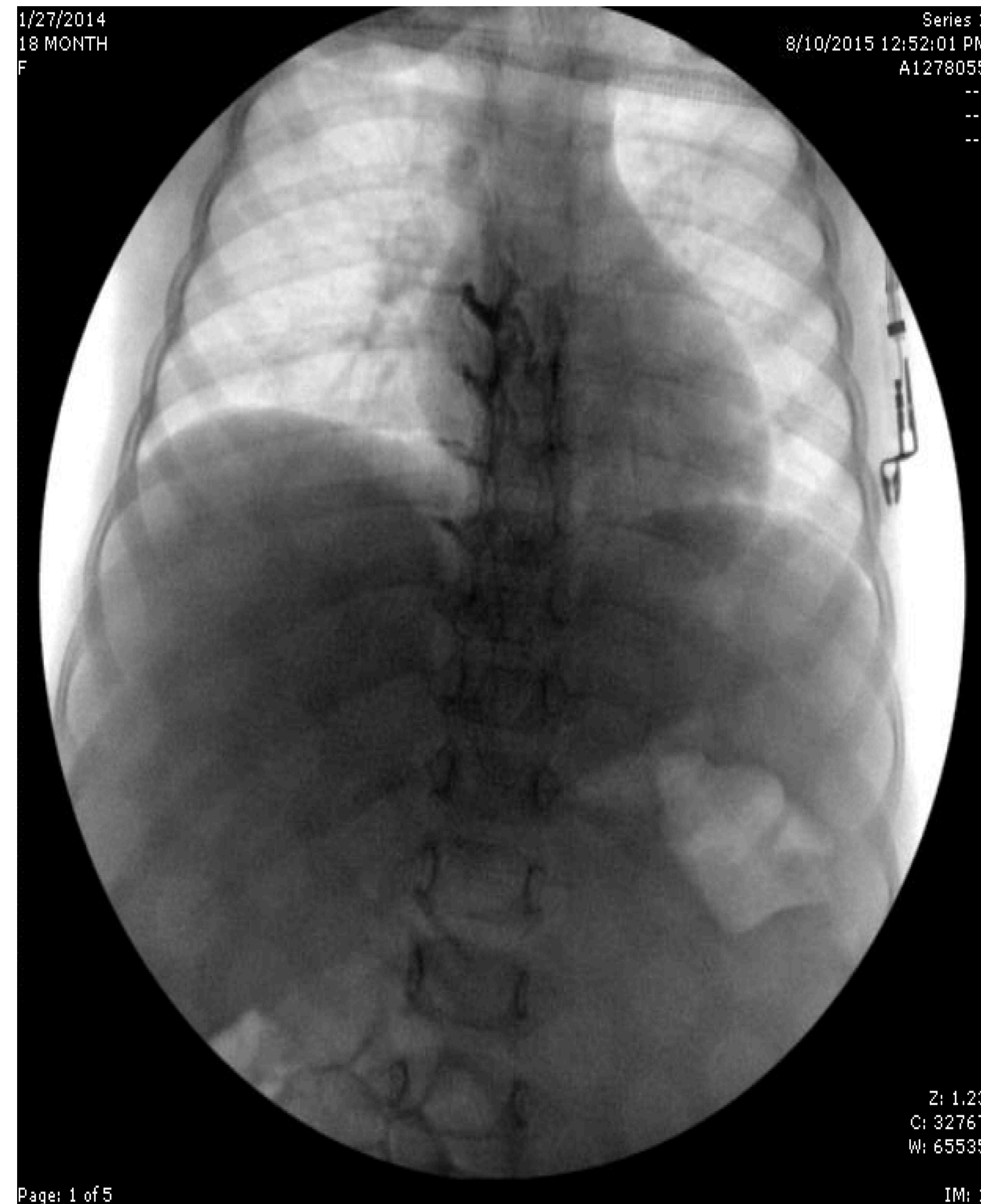


Figure 1. Epidurogram of first epidural attempt demonstrating vascular course of contrast dye.

Discussion

- Epidurograms are a valuable method to verify epidural placement, especially in patients with large intra-abdominal tumors.
- Patients with large abdominal masses have increased abdominal pressure, leading to epidural venous engorgement.
- It is important to recognize the epidural plexus enlargement in these patients and the resulting difficulty in epidural placement.
- The decreased abdominal pressure after tumor resection may have led to decreased distension of the epidural venous plexus, allowing for successful placement postoperatively.
- This case highlights the difficulty with preoperative epidural catheter placement in patients with large intra-abdominal tumors and the importance of epidurograms as a confirmation technique to ensure identification of misplaced catheters.

Conclusions

- Epidural catheters are frequently placed in children for post-operative analgesia.
- An epidurogram is an additional confirmation technique to aid in diagnosing misplaced catheters.
- Patients with large intra-abdominal tumors may have enlarged epidural veins, increasing the likelihood for intravascular epidural placement.
- Placement of epidural catheters after abdominal tumor resection, with an epidurogram performed for confirmation, may aid in avoidance of misplaced catheters.

References

1. Taenzer, A. et al. Experience with 724 epidurograms for epidural catheter placement in pediatric anesthesia. *Reg Anesth Pain Med.* 2010; 35(5): 432-5.
2. Yeager, MP, et al. Fluoroscopy-assisted epidural catheter placement: an exploratory analysis of 303 pre-operative epidurograms. *ACTA Aneesthesiologica Scandinavica.* 2016; 60: 513-519.