Central Line Placement in the Presence of a Ventriculo-Atrial Shunt
University of Arkansas for Medical Sciences and Arkansas Children’s Hospital

Joshua D. Dilley, MD1; M-Irfan Suleman, MD1; Sidney Dassinger, MD2, Dale Harrison, PhD, MPH1

INTRODUCTION

- Venous access can be a critical component of any surgery. The presence of a central venous catheter (CVC) allows monitoring of hemodynamics and the delivery of maintenance fluids, blood products, or lifesaving medications.
- If a CVC is not placed correctly, it may result in complications including bleeding, pneumothorax and potentially death. We describe the placement of a left sided CVC in the presence of a ventriculo-atrial (VA) shunt on the right side, using a technique that minimized the risk to the shunt and the patient.

CASE DESCRIPTION

- An 18 year old female presented for a posterior spinal fusion.
- Relevant surgical history significant for a ventriculoperitoneal (VP) shunt converted to VA shunt secondary to peritonitis.
- Once an adequate depth of anesthesia was achieved, general surgery arrived for placement of a left subclavian CVC. Using fluoroscopic guidance, the catheter was positioned 2cm proximal to the VA shunt, per neurosurgery recommendations.
- The case proceeded without any anesthetic complications.
- As the tip of the CVL was not within the SVC/Atrial junction, the CVP value was likely inaccurate. As such, the CVP trend, but not absolute value, was followed throughout the case for assistance in maintenance of hemodynamics.
- An estimated 2 liters of blood loss occurred, requiring cells saver blood, donor packed red blood cells, crystalloid, and albumin.
- Following the procedure, the patient was extubated and transferred to the PICU. The CVC and arterial line were removed the following morning.
- After an uneventful hospital stay, she was discharged home four days later.
- At the two week follow-up, there were no signs of complications from the surgery or from the CVC placement. She remained aseptic, and the VA shunt continued to function properly.

DISCUSSION

- A CVC was chosen in this case due to the potential need for monitoring of hemodynamics and high volume of resuscitation through a secure access point.
- Consideration was given to the placement of the left sided CVC because of the desire to leave the shunt undisturbed and to minimize the potential for complications.
- In order to avoid disturbance of the VA shunt, the left subclavian vein was chosen. The subclavian site has also been shown to have lower risks of catheter colonization and thrombotic complications when compared to the femoral site [1].
- Moreover, there is no significant difference in catheter-related complications between the subclavian and internal jugular sites [2].
- Placement of a CVC using radiologic techniques has been shown to be safe and efficient with a high technical success rate and a very low complication rate [3]. Evidence supports not only the performance of a CVC for this case, but also the site used and method of placement [1-3].
- In this case, the left subclavian site and the use of fluoroscopy to place the CVC resulted in good outcomes in a patient with a right sided VA shunt in place.

REFERENCES


1Division of Pediatric Anesthesiology and Pain Medicine, 2Division of Pediatric Surgery, Arkansas Children’s Hospital, 1 Children’s Way, Little Rock, AR 72202