Scrotal migration of ventriculoperitoneal shunt: a case report at Haji Adam Malik hospital, Medan

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Abstract. Ventriculoperitoneal (VP) shunting is one of the most common pediatric neurosurgery operations performed for dealing with hydrocephalus. We report an unusual case of a 1-year-old child with communicating hydrocephalus, who experienced right scrotum swelling after 11 months of shunting. Abdominal x-ray showed the shunt tubing, which was kinked in its distal portion of thescrotum. Ultrasound examination was performed, revealing hydrocele along with the presence of thedistal catheter in the scrotum. The patient underwent distal catheter trimming via laparoscopic approach with general surgery and managed with asuccessful outcome. Prompt surgical management of catheter repositioning is recommended to avoid the risk of further complications.

1. Introduction

Shunt placement is aim to divert cerebrospinal fluid (CSF) from within the ventricles, from subarachnoid space in the lumbar spine, or from a pre-existing cyst to an alternative location in the setting of hydrocephalus.[1] The most common pediatric neurosurgery operations performed to deal with hydrocephalus is ventriculoperitoneal (VP) shunting.[2] After the procedure, excess CSF will be diverted from the brain ventricles to the peritoneal cavity of the abdomen via a catheter.[3] However, numerous complications such as infection, knotting, the malfunction could be found.

One of thesites that not commonly seen of distal catheter migration is the scrotum.[4] Previous studies have reported other sites of migration include the ventricle [5], scalp/subgaleal space [6], neck [7], mouth [8], breast [9], breast implant [10], thoracic cavity [11], large intestine [12], gallbladder [13], bladder/urethra [14],vulva/vagina [15], and rectum/anus.[16] Here we report a case of distal portion migration of VP shunt through the processes vaginas into the scrotum.

2. Case Report

A one-year-old boy was referred to the emergency department with ahistory of right scrotal swelling, which had slowly grown over three days. There was no history of vomiting, diarrhea, hematuria, irritability or scrotum trauma. The patient was born at 36 weeks gestational age, with abirthweight of 3100 gr. At the age of 5 months, the patient came with communicating hydrocephalus,and VP shunt was placed. Check-up radiography of the abdomen was performed after the7-month operation is shown in figure 1.

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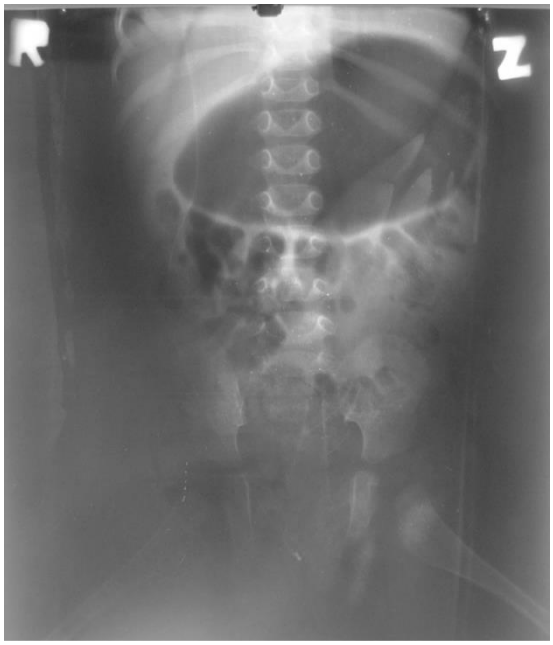


Figure 1. Abdominal radiography of patients after 7 months of ventriculoperitoneal shunt placement.

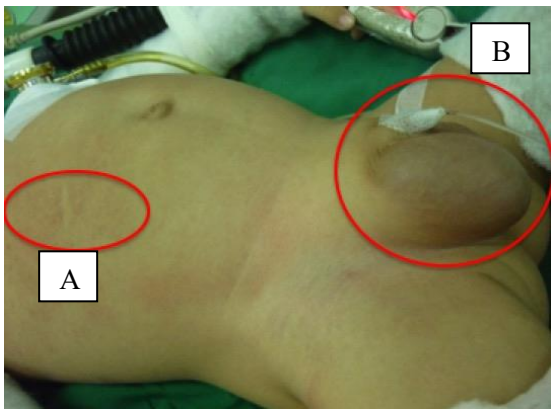


Figure 2. Insertion place of peritoneal shunt (A), distended scrotum, the bilateral testis was found, no shunt was palpable (B).

On admission, vital signs were measured, temperature 36^{o}C, pulse rate 120 beats/minute, respiratory rate 26 breaths/min, blood pressure 110/65mmHg and SaO2 99%. In physical examination, he appeared malnourished. The right scrotum was found to be distended. Bilateral testicles were palpable on both sides as seen in figure 2. There were no signs of shunt malfunction. A complete blood cell count showed leukocyte count16080/mm^{3}; segmented neutrophils 60%; hemoglobin level 10.3mg/dL; hematocrit 33.4%; and platelet 312000/uL. Other laboratory studies included: glucose 85mg/dL; serum urea nitrogen 24mg/dL; serum creatinine 0.34mg/dL; sodium136mEq/L; potassium 4.9mEq/L; and prothrombin time with an international normalized ratio (INR) of 1.11. The patient underwent an abdomen x-ray that as in figure 1. Abdomen x-ray showed the shunt tube in the abdomen, which was kinked in its distal portion of the right scrotum. Shunt reposition was performed. The peritoneal end of the shunt was repositioned in the peritoneal cavity, and the processesvagina was closed. The patient had an uneventful postoperative recovery and was discharged seventh days later.

3. Discussion

In pediatric neurosurgery, VP shunting for hydrocephalus case is one of the most common operations. In this procedure, To be able to absorb, a shunt was placed to divert CSFto the peritoneal cavity, where it is absorbed. Shunting was associated with several complications including over drainage, obstruction or malfunction, infection, coiling, migration, knotting and viscous perforation.[17] The distal catheter of VP Shunt can go into various other body parts.[18]

VP shunt complications are classified as mechanical, functional and infective. It is known that shunt infection is the most common post-operative complication. Another common complication is shunt obstruction or malfunction. The ultimate treatment for both infection and shunt obstruction is surgical shunt revision. Infants with VP shunts should be monitored lifelong. It rarely happens that migration of the distal catheters of VP shunt. Migration of VP shunt has been reported in several body compartments.[5-12] Most of these patients come with abdominal signs. Migration may occur when the shunt tube moves to a location that inhibits proper drainage. [19] It has been reported only in 30 case reports in the English literature.[18]

The migration of a tube into the scrotum also requires a patent processesvaginas. This event can occur following a high intra-abdominal pressure causing migration of the catheter into the scrotum. Gupta M et al. [20] found that the minimum length of the distal catheter placed in peritoneal cavity was 44cm,and the maximum length was 52cm in 30 children. It was shown that the length of peritoneal shunt catheter was not associated with an increase in complications.[20] Long-term outcome of VP shunt placement in child showed a high rate of complications requiring shunt revision.[21]

A high index of apprehension is neededin making the diagnosis. Diagnosis can be established by plain x-ray of the abdomen, which identifies the distal portion of the shunt tube in the scrotum. An immediate surgical management for catheter repositioning is recommended in these cases to avoid the risk of further complications.

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