Case Report

Scrotal Migration of Ventriculoperitoneal Shunt: a case report; Haji Adam Malik Hospital, Medan

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Abstract.

Introduction: Ventriculoperitoneal (VP) shunting is one of the most common pediatric neurosurgery operations performed for dealing with hydrocephalus. One of the rare shunt complications is distal catheter migration, and various body sites have been reported, including the scrotum.

Presentation of case: We report an unusual case of a 1-year-old child with communicating hydrocephalus, who developed right scrotum swelling after 11 month of shunting. Plain abdominal x-ray showed the shunt tubing, which was kinked in its distal portion within scrotum. Ultrasound was performed, revealing hydrocele along with the presence of distal catheter in the scrotum. Patient underwent distal catheter trimming via laparoscopic approach with general surgery and managed with successful outcome.

Discussion/conclusion: Prompt surgical management of catheter repositioning is therefore recommended to avoid the risk of further complications.

Introduction

The role of shunt placement is to divert cerebrospinal fluid (CSF) from within the ventricles, from subarachnoid space in lumbar spine, or from a pre-existing cyst to an alternative location in the setting of hydrocephalus.1 Ventriculoperitoneal (VP) shunting is one of the most common pediatric neurosurgery operations performed for dealing with hydrocephalus2. Following the performance of this procedure, excess cerebrospinal fluid (CSF) will be diverted from the brain ventricles to the peritoneal cavity of the abdomen via a catheter.3 However, it can be associated with numerous complications and consequences such as infection, knotting, malfunction and etc.

One of the rare sites of distal catheter migration is the scrotum.4 Other reported 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 gall bladder,13 bladder/urethra,14
vulva/vagina, and rectum/anus. Here we report a case of distal portion migration of VP shunt through the processus vaginalis into the scrotum.

**Presentation of case**

A one-year-old male child was referred to the emergency department with history of right scrotal swelling, which had slowly grown over three days. There was no history of vomiting, diarrhea, hematuria, irritability or scrotal trauma. The patient was born at 36 weeks gestational age, with birth weight of 3100 gr. At the age of 5 months, patient came with communicating hydrocephalus and VP shunt was placed. Check-up radiography of the abdomen was performed after 7 month operation is shown in figure 1.

On arrival, vital signs were as follows: temperature 36°C, pulse rate 120 beats/minute, respiratory rate 26 breaths/minute, blood pressure 110/65 mmHg and SaO2 99%. In physical examination, he appeared malnourished. The right scrotum was found to be distended. Bilateral testicles were palpable on both sides. There were no features of shunt malfunction; in figure 2. A complete blood cell count showed the following: leukocyte count 16080/mm3; segmented neutrophils 60%; hemoglobin level 10.3 mg/dL; hematocrit 33.4%; and platelet 312000/uL. Other laboratory studies included: glucose 85 mg/dL; serum urea nitrogen 24 mg/dL; serum creatinine 0.34 mg/dL; sodium 136 mEq/L; potassium 4.9 mEq/L; and prothrombin time with an international normalized ratio of 1.11. The patient underwent an abdomen x-ray as shown in figure 2. Abdomen x-ray showed the shunt tube in the abdomen, which was kinked in its distal portion within the right scrotum. Operation was performed. The peritoneal end of the shunt was repositioned in the peritoneal cavity, and the processus vaginalis was closed. The patient had an uneventful postoperative recovery and was discharged seventh days later.
Figure 1. Abdominal radiography of patients after 7 month of ventriculoperitoneal shunt placement.
Discussion/conclusion

In pediatric neurosurgery, VP shunting for hydrocephalus case is one of the most common operations. In this procedure, a shunt is placed to divert CSF from the dilated ventricles to the peritoneal cavity, where it is absorbed. VP shunting is associated with well-known complications including over drainage, obstruction or malfunction, infection, coiling, migration, knotting and viscous perforation. The distal catheter of VP Shunt can migrate into various body parts.

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. A clinical assessment which is done properly will lead to timely identification of complications and their prompt treatment. Infants with VP shunts should be monitored lifelong by neurosurgeons. Migration of the distal catheters of VP shunt rarely happens. The distal catheter of VP shunt can migrate into various body parts. Migration of VP shunt has been reported in several body compartments, including the mediastinum, chest, abdominal wall, gastrointestinal tract, and pelvic cavity. Common presentations of VP shunt malposition complications include peritonitis, gastrointestinal perforation, ileus, inguinal hernia, peritoneal pseudocysts, loss of catheter into the peritoneal cavity, and abscesses. Most of these patients come with abdominal signs. Migration occurs when the shunt tube moves from its original position to a location that inhibits proper drainage. Migration of the distal portion of the shunt through the processus vaginalis into the scrotum is a very rare complication. It has been reported only in 30 case reports in the English literature.

The migration of a tube into the scrotum also requires a patent processus vaginalis. This event can occur following a high intra-abdominal pressure causing migration of the catheter into scrotum. The length of the distal catheter in peritoneal cavity increases the probability of migration. Migration can occur due to improper length. In our case, the plain abdominal x-ray showed the shunt tube, which was bent in its distal portion within the right scrotum. Gupta M et al. investigated 30 children with full-length peritoneal shunts to recognize the rate of complications. Out of the 30 children, the minimum length of the distal catheter placed in peritoneal cavity was 44 cm and the maximum length was 52 cm. It was
shown that use of an extended length peritoneal shunt catheter was not associated with an increase in complications and eliminated the need to lengthen the peritoneal catheter for growth of the patient.\textsuperscript{20} Long-term outcome of VP shunt placement in child showed a relatively high rate of complications requiring shunt revision as late as 30 years after initial placement.\textsuperscript{21}

Usually the primary image is easily accessible and frequently compared to newly taken images to diagnose migration of the distal catheter of VP shunt. A high index of apprehension is required when 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.

References


