Case Report

Urethral protrusion of the abdominal catheter of ventriculoperitoneal shunt: Case report of extremely rare complication

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ABSTRACT

Hydrocephalus in its various forms constitutes one of the major problems in pediatric neurosurgical practice. The placement of a ventriculoperitoneal (VP) shunt is the most common form of treatment for hydrocephalus, so that all neurosurgeons struggle with shunt malfunctions and their complications. Well-known complications are connected with the use of the valve systems (malfunction, infectious, overdrainage, secondary craniosynostosis, etc.). We report an unusual case of protruding abdominal catheter from the urethra. This girl had received a VP shunt for hydrocephalus following surgery of posterior fossa medulloblastoma 4 years ago. After admission, the entire system was removed, antibiotic treatment was administered for 2 weeks, and a new VP shunt was placed. The postoperative course was uneventful. This complication is extremely rare.

Key words: Hydrocephalus, ventriculoperitoneal shunt, urethral protrusion

Introduction

Hydrocephalus is a common clinical problem seen in pediatric neurosurgical practice.[1] At present, neurosurgical practice is confronted by an explosion of technology.[2,3] In spite of all advances in neuroendoscopic surgery,[4] the placement of a ventriculoperitoneal (VP) shunt, from its first realization in 1908 by Kausch till our days,[5] is still amongst the most frequently performed operations in the management of hydrocephalus.[6] Well-known complications are connected with the use of the valve systems (malfunction, infectious, overdrainage, secondary craniosynostosis, etc.).[7-13] Perforation of the bladder by an abdominal catheter of a VP shunt is extremely rare. We report an unusual case of protruding abdominal catheter from the urethra. We investigated the literature and found seven similar cases.[6,8,14-18] Three of them were recently published,[16-18] so our case is eighth reported case with this complication in the literature.

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Case Report

A 5-year-old girl, who had received a VP shunt for hydrocephalus following surgery of posterior fossa medulloblastoma 4 years ago, readmitted to our hospital with protruding abdominal catheter from the urethra. On admission, the child was in a poor condition, afebrile, and alert but rather flaccid. Cerebrospinal fluid (CSF) analysis was done. CSF parameters showed high white blood cell (WBC) count 110 cell/mm^3, low glucose level 39 mg/dl, and high protein 227/dl. The CSF sample was obtained for culture. The tip of the abdominal catheter was protruded from the urethra. The patient underwent plain X-rays of cranium, thorax and abdomen, cerebral, and abdominal CT scan. Abdominal X-ray showed an abnormal distal location of catheter distal tip [Figure 1]. Cranial CT scan showed overdrainage of ventricles. Laparotomy, performed jointly by neurosurgeons

and pediatric surgeons, exposed the catheter and removed it and repaired the bladder. After the entire shunt system was removed, antibiotic treatment was administered for 2 weeks. Under treatment with antibiotics the child showed clinical improvement and progressive normalization of the CSF parameters, and a new VP shunt was placed. The postoperative course was uneventful.

Discussion

VP shunting in a patient with medulloblastoma can be considered in progressive symptomatic hydrocephalus.[19] Ventriculo peritoneal shunt is also carried out in hydrocephalus in a patient with medulloblastoma. Our case with medulloblastoma had received a VP shunt 4 years ago. VP shunt-related complications may occur anywhere along its course from the ventricle cranially to the peritoneal cavity caudally.[12] The distal end of the VP shunt had been placed in the peritoneal cavity, but this procedure is also associated with several complications,[7-9,20] as can be seen in our case. The incidence of VP shunt-related abdominal complications has been reported to be from 5% to 47%. The most common distal VP shunt complications include shunt infection, subcutaneous collection of CSF, peritoneal pseudocyst, bowel perforation, intestinal volvulus,[21] catheter disconnection; and extraperitoneal retraction of the catheter through the mouth, umbilicus, bladder, vagina, anus, scrotum.[9,22-24] In our case, physical examination, abdominal X-ray, CT scan helped us establish the diagnosis rapidly. The abdominal X-ray [Figure 1] and CT scan showed a foreign body inside of bladder and urethra [Figures 2-3] and cranial CT scan showed overdrainage of ventricles. This migration of peritoneal catheter may be attributed to inspirations and expirations with a Valsalva effect, but no positive demonstration of this hypotheses has ever been published, so the real mechanism causing this urethral protrusion remains unclear. Our etiological speculations could be better explained by an experimental animal model. That would give us better knowledge of hydrodynamic happenings during CSF drainage. These distal VP shunt complications can be effectively managed surgically, and we operated this case. During surgery, we inspected peritoneal cavity, found protruded the distal catheter from the urethra. We repaired the defect of bladder and placed a new distal catheter into the peritoneal cavity. Previously, seven cases with protruding abdominal catheter of VP shunt from the urethra were reported [Table 1].[6,8,14-18] Three of these seven cases were recently reported.[16-18] As can be seen from table, this complication is very rare. Our case is the eighth reported case in the literature. We treated this patient as an emergency because protruding the abdominal

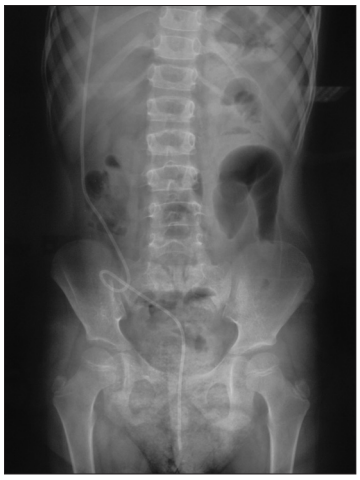

Figure 1: X- ray of patient shows the tip of the abdominal catheter protruding from the urethra

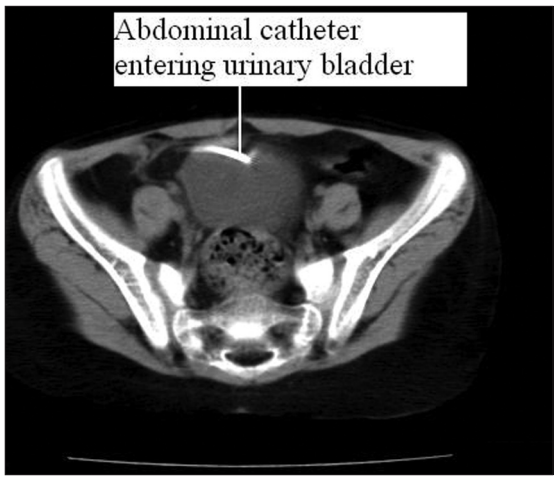

Figure 2: Abdominal CT shows an abdominal catheter entering the urinary bladder

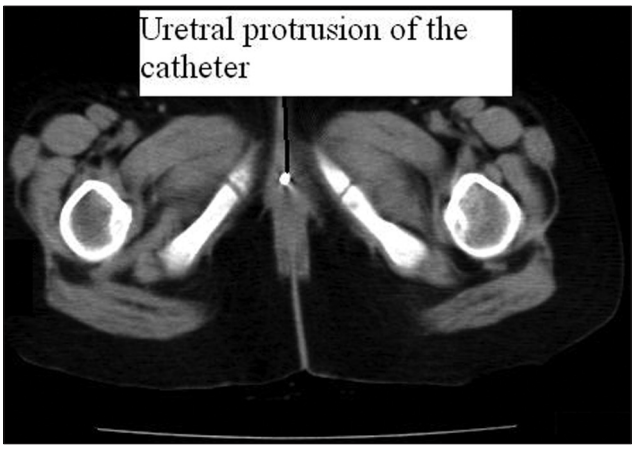

Figure 3: Abdominal CT shows an abdominal catheter protruding from urethra

Table 1: Published cases with urethral protrusion of the abdominal catheter VP shunt

Authors	Age of patient	Sex of patient
Prasad *et al* [14]	Unknown	Unknown
Bavbek *et al* [8]	Unknown	Female
Ueda *et al* [15]	82	Female
Surchev *et al* [6]	Unknown	Unknown
de Aguiar *et al* [16]	Unknown	Unknown
Chen *et al* [17]	Unknown	Unknown
Pohlman *et al* [18]	14 years	Male

catheter from the urethra can lead to dysfunction of shunt or overdrainage, and infection such as meningitis.

Conclusion

VP shunt procedures are still in use despite recent technologic advances such as endoscopic third ventriculostomy. Care should be taken to prevent complications. This case report highlights a point of practical interest: pediatric neurosurgeon and parents must always be alert for possible urethral protrusion in children having a VP shunt because if the catheter is protruded it might lead to serious outcome.

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