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Rare Complication of Ventriculoperitoneal Shunt: Anal Extrusion

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Abstract
Ventriculoperitoneal Shunt (VP shunt) surgery is one of the common neurosurgical procedure employed in management of hydrocephalus. Most common complications of VP shunt surgery include shunt malfunction secondary to partial or complete blockage, Shunt infections, slit ventricle syndrome due to over drainage of cerebrospinal fluid and multiloculated hydrocephalus. On distal end abdominal complications like peritoneal pseudocysts, lost distal catheters, bowel perforations and hernias may be seen. Anal extrusion of peritoneal end of VP shunt by perforating intestines requiring revision of shunt is a very rare complication of VP shunt surgery. We report here a case of 7 months old male child who underwent VP shunt surgery at the age of 1 month for congenital hydrocephalus. The baby underwent a revision surgery for blockage of VP shunt 5 months after the first surgery. Now the baby presented with extrusion of peritoneal end of VP shunt through anus. There was evidence of CSF draining through the extruded end of VP shunt. A revision surgery on other side was done. After surgery the baby gradually improved and was eventually discharged after 3 weeks.

Keywords- *Congenital Hydrocephalus, Ventriculoperitoneal shunt, Anal Extrusion.*

Introduction

Hydrocephalus is a one of the most common disorder of cerebral spinal fluid (CSF) physiology resulting in dilatation of the cerebral ventricles. Before closure of sutures (Infancy) this usually causes progressive increase in head circumference whereas in children of more than 2 years of age (after closure of cranial sutures) it presents with signs and symptoms of intracranial hypertension[1]. Hydrocephalus can be divided into 2 subtypes namely Communicating and non communicating hydrocephalus [2]. In cases of communicating hydrocephalus the flow of CSF is not obstructed and the basic pathology is inadequate absorption of CSF in the subarachnoid space. This type of hydrocephalus is commonly seen in tubercular meningitis. Second type of hydrocephalus is non communicating hydrocephalus in which the basic pathology is obstruction to CSF flow from the ventricles to subarachnoid space. Non communicating hydrocephalus can further be devided into congenital and acquired depending upon the etiology of hydrocephalus [3].

The common causes of hydrocephalus in paediatric age group include congenital hydrocephalus, X-linked hydrocephalus, Choroid plexus papilloma, venous sinus occlusion, vein of galen malformation, tubercular meningitis and pyogenic meningitis with sequel [4]. The commonly performed procedure to relieve hydrocephalus is VP shunt surgery [5]. There are various types of valve assemblies used for shunting of cerebrospinal fluid from ventricles to the peritoneal cavity [6]. Though VP shunts are very useful in relieving hydrocephalus they are prone to cause various complications. The common complications seen with VP shunts are shunt malfunction, blockage, shunt infections and meningitis [7]. The abdominal complications seen with VP shunts include infections, CSF fistula, paralytic ileus, perforation, hernia and hydrocele [8]. Rare complications include spontaneous extrusion of the tube through the umbilicus or anus [9]. The early diagnosis and prompt management of these complications can prevent complications like ventriculitis, meningitis and finally sepsis by intestinal flora [10].

Case Report

7 month old male child was brought with complaint of white catheter (VP shunt) extruding from anus since 1 day .There was a past history of hydrocephalus in the patient since birth. For this the baby was operated at the age of 1 month. There was also a history of a revision surgery 1 month back for blocked shunt. Since revision surgery the baby was fine with no active complaints. 1 day back Mother noticed something coming out of anus and for this complaint the baby was brought to us.

On examination the child was vitally stable, Cry, tone and activity was normal. There was no evidence of any focal neurological deficitor any signs suggestive of meningitis. Respiration was regular 36 /min. Pupils were normally reacting and equal in size. Reflexes were also normal. VP shunt was seen extrudingg from anus [Figure 1]. The length of Vp shunt outside anus was 22 cms. cerebrospinal fluid was seen draining from this extruded end of VP shunt.

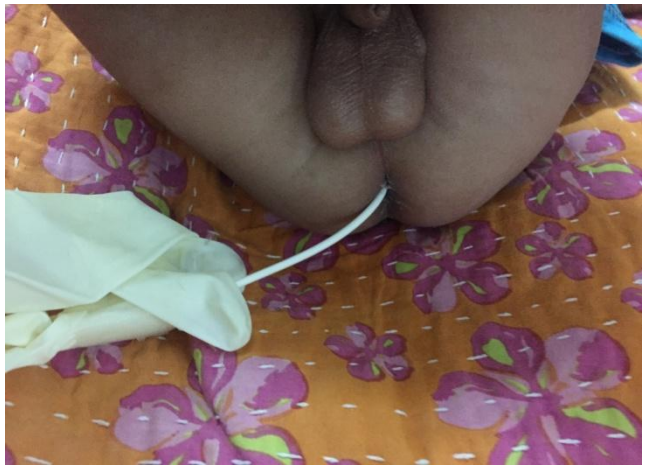

Figure 1: Distal end of ventriculoperitoneal shunt seen extruding from anus.

Preoperative investigations showed mild polymorphonuclear leukocytosis, anaemia and hypoproteinemia (total wbc count 14000/mm3, Hb-8.5gm/dl, serum total proteins 4.5g/dl) . Blood urea and serum creatinine was within normal limits. C-Reactive protein was normal (CRP= 3). An X-Ray abdomen was done which showed shunt in peritoneal cavity and penetration of peritoneal end through rectum [Figure 2].

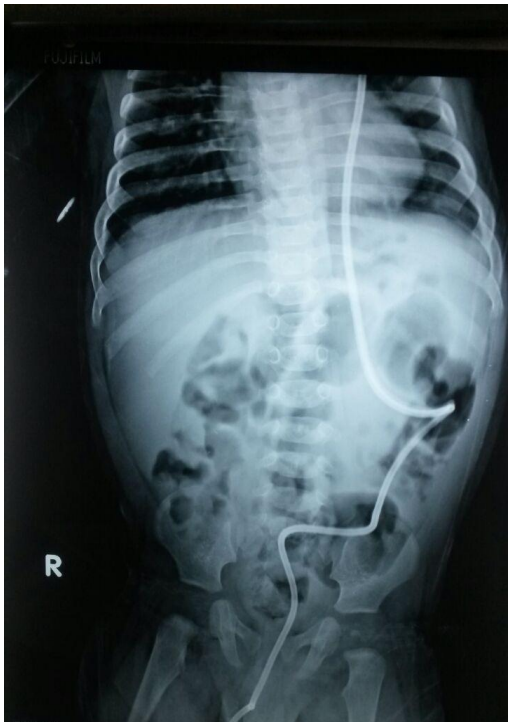

Figure 2 : X-Ray Erect Abdomen showing shunt in peritoneal cavity with distal end migrating inferiorly.

On Ultrasound there was no e/o any peritoneal collection. Computerised tomography scan showed hydrocephalus with shunt in third ventricle with scalp defect from where shunt was inserted [Figure 3].

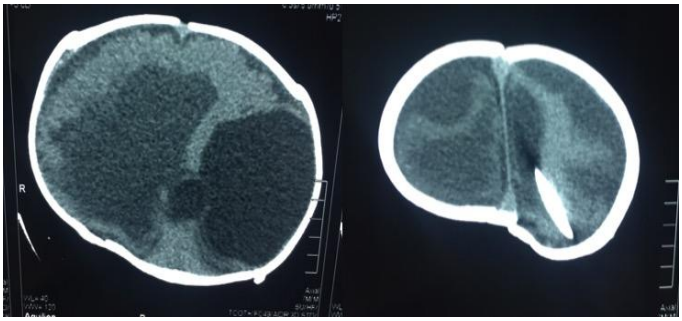

Figure 3 : Computed Tomography of Brain showing hydrocephalus with shunt in 3rd ventricle.

Patient was kept nil by mouth and started with Intravenous fluids and broad spectrum injectable antibiotics to prevent meningitis. Patient was posted for surgery. Incision was given over previous scar in left parietal region. VP shunt was removed first by cutting shunt inferior to chamber then extruded end is pulled through anus. Patient was observed for 24 hours for any drowsiness or altered sensorium. Baby developed fever on next day. injectable paracetamol was given to control fever and blood culture was sent. There were 2 episodes of generalised tonic clonic convulsions following which the baby developed drowsiness. Patient was given phenobarbitone in the loading dose of 20mg/kg but the convulsions continued hence another dose of phenobarbitone 10mg/kg was given to which patient responded. Later phenobarbitone was continued in maintenance dose of 10mg/kg/day in 2 decided doses. A revision shunt surgery was done on opposite side. Patient tolerated surgery well. In the post-operative period the baby was hemodynamically stable. The condition of baby improved gradually and baby was given nasogastricc feeding initially followed by spoon feeding and then breast feeding was started. Later patient was discharged after 3 weeks of hospital stay with an advice for regular follow up and monitoring of head circumference.

Discussion

Hydrocephalus is common in paediatric age group. Common causes of hydrocephalus in children include congenital hydrocephalus, post tubercular or pyogenic meningitis and idiopathic [11]. VP shunt is one of the universally accepted procedure in management of hydrocephalus. The VP shunt though very effective in decreasing intracranial tension by drainage of CSF is fraught with the danger of complications. The complications my involve any part of VP shunt from cranial to caudal end and its course [12]. Common complications include kinking, complete or partial blockage, shunt infection, meningitis, ventriculitis and sepsis. The abdominal complications include perforation, migration of tube into pleural cavity, liver, heart, and scrotum, anus or abdominal wall [13].

The unusual complication of anal extrusion of VP shunt was first reported by Wilson and Bertrand in 1966 [14]. Later many vases of bowel perforation and few cases of extrusion through anus were reported [15]. Exact pathogenesis of VP shunt related organ perforation is unclear. Various mechanisms have been suggested including foreign body reaction, poor nutritional status with weakening of intestinal wall stiff end of shunt tube causing pressure necrosis and immune mediated reactions against the material of VP shunt tube. [16]. Because of weak bowel musculature children are more susceptible to intestinal perforation [17]. Most cases of bowel perforations caused by peritoneal catheter occur well after the surgery suggesting that they resulted from chronic inflammatory process rather than traumatic event. In this case poor nutritional status along with infection would be precipitating cause. In majority of cases bowel perforations are asymptomatic [18]. Few cases present with complications like intestinal obstruction, adhesions, peritonitis, tube knotting which warrant emergency exploratory laparotomy [19]. After removal of migrated VP shunt causing bowel perforation , spillage of intestinal contents into peritoneal cavity does not occur due to formation of mature tract around catheter which attached to bowel surface so there is no requirement

of surgical procedures like laparotomy, laparoscopy or endoscopy, perforation of bowel can be managed conservatively [20]. In this case also there was no requirement of any surgical procedure.

Conclusions

Though uncommon intestinal perforation anal extrusion of VP shunt should always be considered in patients having VP shunt and clinical features suggestive of perforation. Immediate imaging and prompt management will decrease the morbidity and mortality associated with these unusual complications.

Conflict of Interest: None

References

1. Kahle KT, Kulkarni AV, Limbrick DD Jr, Warf BC. Hydrocephalus in children Lancet. 2016 Feb 20;387(10020):788-99.
2. Kartal MG, Algin O. Evaluation of hydrocephalus and other cerebrospinal fluid disorders with MRI: An update. Insights into Imaging. 2014;5(4):531-541.
3. Rizvi R, Anjum Q. Hydrocephalus in children. J Pak Med Assoc. 2005 Nov;55(11):502-7.
4. Venkataramana NK. Hydrocephalus Indian scenario – A review. Journal of Pediatric Neurosciences. 2011;6(Suppl1):S11-S22.
5. Notarianni C, Vannemreddy P, Caldito G, Bollam P, Wylen E, Willis B, Nanda A. Congenital hydrocephalus and ventriculoperitoneal shunts: influence of etiologyand programmable shunts on revisions. J Neurosurg Pediatr. 2009 Dec;4(6):547-52.
6. Ames RH. Ventriculo-peritoneal shunt: The management of hydrocephalus. J Neurosurg. 1967;27:525–529.
7. Berner R, Heinen F, Pelz K, van Velthoven V, Sauer M, Korinthenberg R. Ventricular shunt infection and meningitis due to Bacillus cereus. Neuropediatrics. 1997 Dec;28(6):333-4.
8. Agha FP, Amendola MA, Shirazi KK, Amendola BE, Chandler WF Abdominal complications of ventriculoperitoneal shunts with emphasis on the role of imaging methods. Surg Gynecol Obstet. 1983 Apr; 156(4):473-8.
9. Vuyyuru S, Ravuri SR, Tandra VR, Panigrahi MK. Anal extrusion of a ventriculo peritoneal shunt tube: Endoscopic removal. Journal of Pediatric Neurosciences. 2009;4(2):124-126.
10. Li XY, Wang ZC, Li YP, Ma ZY, Yang J, Cao EC. [Study on treatment strategy for ventriculitis associated with ventriculoperitoneal shunt for hydrocephalus].2005 Sep;17(9):558-60.
11. Bateman GA, Smith RL, Siddique SH. Idiopathic hydrocephalus in children and idiopathic intracranial hypertension in adults: two manifestations of the same pathophysiological process? J Neurosurg. 2007 Dec;107(6 Suppl):439-44.
12. Ghritlaharey RK, Budhwani KS, Shrivastava DK, Srivastava J. Ventriculoperitoneal shunt complications needing shunt revision in children: a review of 5 years of experience with 48 revisions. Afr J Paediatr Surg. 2012 Jan-Apr;9(1):32-9.
13. Panagea S, Cartmill TD, Panigrahi H. Intracerebral sepsis due to intestinal perforation by ventriculo-peritoneal shunts: two cases. J Infect. 1997 Jul;35(1):86-8.
14. Wilson CB, Bertan V. Perforation of the bowel complicating peritoneal shunt for hydrocephalus. Report of two cases. Am Surg. 1966 Sep;32(9):601-3.
15. Schulhof LA, Worth RM, Kalsbeck JE. Bowel perforation due to peritoneal shunt. A report of seven cases and a review of the literature. Surg Neurol. 1975 May; 3(5):265-9.
16. VandeVord PJ, Gupta N, Wilson RB, Vinuya RZ, Schaefer CJ, Canady AI, Wooley PH. Immune reactions associated with silicone-based ventriculo-peritoneal

shunt malfunctions in children. Biomaterials. 2004 Aug;25(17):3853-60.

17. Hai A, Rab AZ, Ghani I, Huda MF, Quadir AQ. Perforation into gut by ventriculoperitoneal shunts: A report of two cases and review of the literature. Journal of Indian Association of Pediatric Surgeons. 2011;16(1):31-33.
18. Rinker EK, Osborn DA, Williams TR, Spizarny DL. Asymptomatic Bowel Perforation by Abandoned Ventriculoperitoneal Shunt. Journal of Radiology Case Reports. 2013;7(9):1-8.
19. Birbilis T, Zezos P, Liratzopoulos N, et al. Spontaneous bowel perforation complicating ventriculoperitoneal shunt: a case report. Cases Journal. 2009;2:8251.
20. Bourm K, Pfeifer C, Zarchan A. Small bowel perforation: a rare complication ventriculoperitoneal shunt placement. J Radiol Case Rep. 2016 Jun 30;10(6):30-35.