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Series of 3 Cases of Silent Colonic Perforation by Ventriculoperitonal Shunt Catheter Prolapsing through Anus, an Infrequent Complication: A Case Report

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Abstract The ventriculoperitoneal shunt has been the preferred therapy for chronic hydrocephalus for a long time. Complications of this therapy include pseudocyst formation, perforation of the gastrointestinal tract, penetration into solid organs/abdominal wall, protrusion outside the body, disconnection and infection. Bowel perforation is rare complication of VP shunt placement [8]. Silent colonic perforation by ventriculoperitoneal shunt catheter and later patient presenting with catheter prolapsing from anal opening is seen less frequently [1]. We had 3 children 1-3 years old a case of hydrocephalus with ventriculoperitoneal shunt presenting in above scenario. Patients were completely asymptomatic with no features of toxemia indicating a chronic process [2]. Treatment involves pediatric surgical help in removing the shunt catheter, waiting for a sterile cerebrospinal fluid sample via repeated cultures and replacement of shunt catheter in a different quadrant in abdominal cavity.

Keywords: *colonic perforation by shunt catheter*

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1. Introduction

Various complications of ventriculoperitoneal shunt are reported in the literature. Starting from shunt malfunction, shunt infection, shunt disconnection and rarely we see silent perforation of colon by abdominal end of shunt tube and patient presenting with shunt tube seen prolpasing from anal opening [3]. Treatment is again a challenge. With colonic perforation shunt infection is likely hence discarding the present shunt system and replacing with a external ventricular drain till csf is satisfactory is the standard policy.

2. Material and Methods

We herewith present series of 3 children 1-5 yr old who were born with congenital hydrocephalus as per table shown in last 10 yrs. The last case with lumbosacral myelomeningocele with hydrocephalus on 30/10/2015 Figure 1, Figure 2 and Figure 3. Last patient in our series underwent repair of myelomeningocele with insertion of a programmable VP shunt at birth Figure 4. Patient had post operative non healing of the lumbosacral wound not responding to usual antimicrobial therapy and dressings hence required plastic surgery team putting a split thickness skin graft on 29/11/2015 and gradually the wound healed. Patient was paraperetic and incontinent to bowel and bladder as part of myelomeningocele. Patient was being followed up in spina bifida clinic by pediatric surgery, orthopedic and rehab teams. On 23/6/2016 however patient presented with shunt obstruction which was confirmed with CT brain and shunt system was revised.

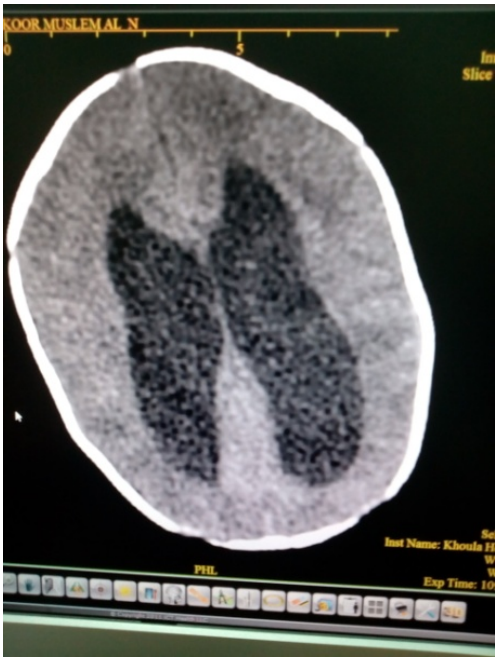


Figure 1. Pre op CT brain of patient at birth

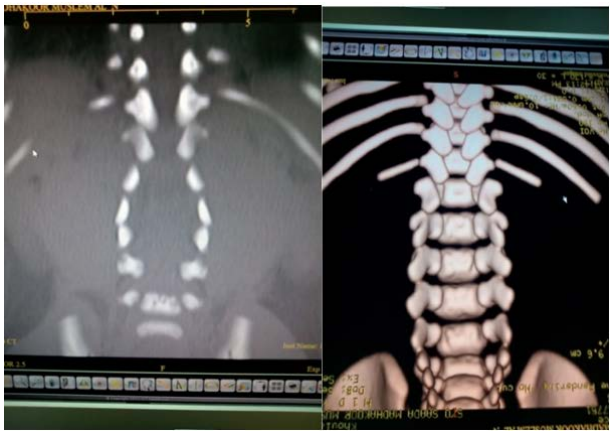


Figure 2. Pre op CT spine showing the spinal defect

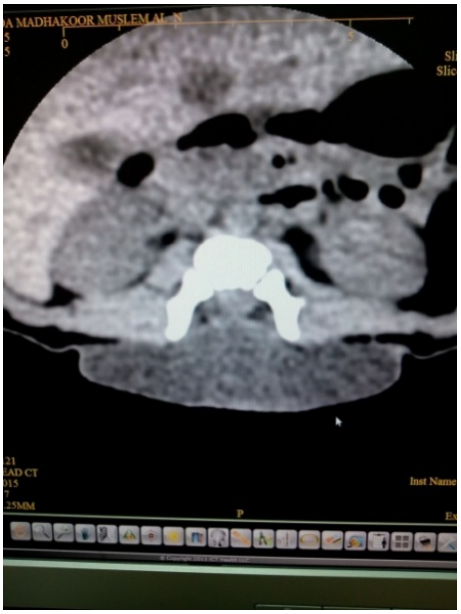


Figure 3. Showing the myelomeningocele baby was bon with

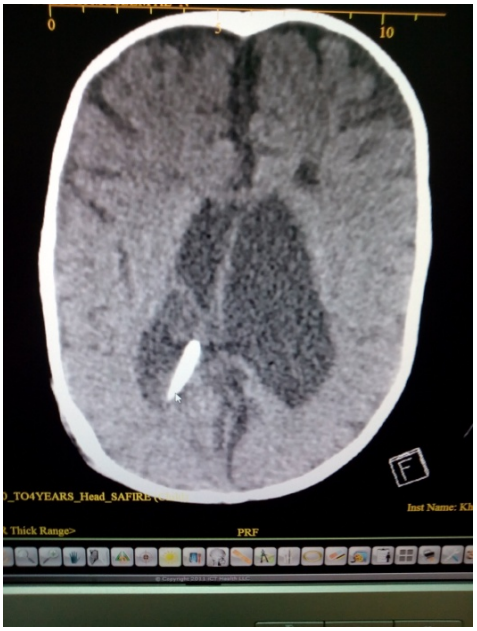


Figure 4. CT brain of the patient after the shunt at birth

On 8/1/2017 however mother noticed white shunt tube prolapsing through anus while child was defecating Figure 5. Child was afebrile with active alert and no signs of toxemia was seen. Child underwent CT brain which revealed well functioning shunt and CT abdomen which revealed shunt perforation at transverse colonic region Figure 6. This shunt was a Codman (hakim programmable valve) system.

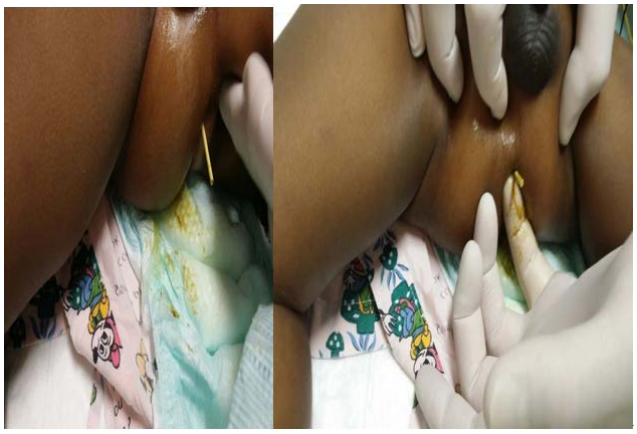
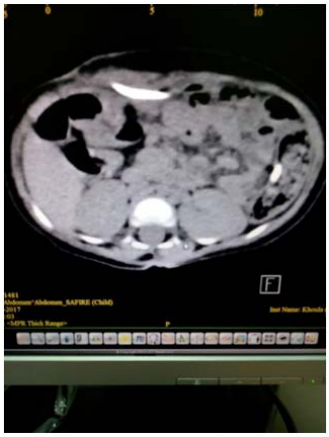


Figure 5. Prolapse of shunt distal end via the anus



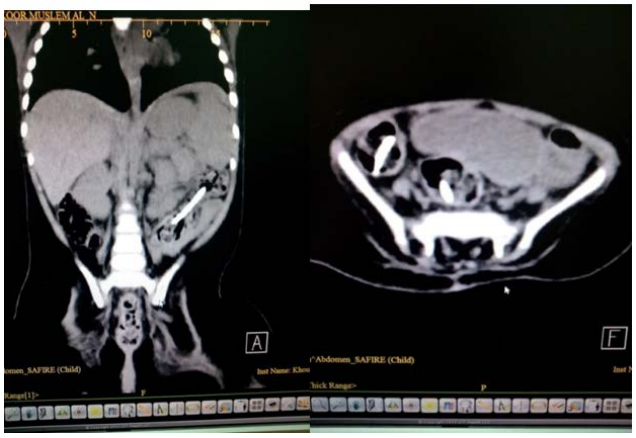


Figure 6. CT abdomen showing the colonic perforation via shunt catheter

Previous children one had only hydrocephalus and VP shunts were in place and presented with silent shunt prolapse through anus other one had hydrocephalus secondary to intraventricular ependymoma.

Table 1.

Serial no	Age/sex	Diagnosis	Primary procedure	Presentation	Action taken
1	2 yr /male	Hydrocephalus	VP shunt	Shunt catheter seen through anus	Removal of old shunt replacement of new shunt in different abdominal quadrant
2	5yr male	Hydrocephalus secondary to intraventricular ependymoma.	Craniotomy for tumour removal and VP shunt for secondary hydrocephalus	Shunt catheter seen through anus	Removal of old shunt replacement of new shunt in different abdominal quadrant
3	1 yr /male	Hydrocephalus with lumbar myelomeningocele	VP shunt with repair of myelomeningocele	Shunt catheter seen through anus	Removal of old shunt replacement of new shunt in different abdominal quadrant aftera sterile csf

3. Results

Children were referred to pediatric / general surgery team who joined neurosurgery team and exposed hanging part of the shunt tube was excised and remaining shunt was removed from old abdominal incision in case 2 laparoscopically. From cranial end shunt ventricular catheter was removed and external ventricular drain was kept. Patient remained on EVD till three consecutive CSF cultures were sterile and microscopy acceptable and then EVD was converted to new programmable /fixed pressure shunt in different abdominal quadrant.

Children are on regular follow up and doing well in OPD.

4. Discussion

In 2011 Hai A, Rab AZ et al described in their series time period of bowel perforation after shunt surgery minimum in infants and increases with age and sigmoid and transverse colon followed by stomach are the most frequent sites of gastrointestinal perforations by VP shunt. [1]. In 2007 Ghritlaharey RK, Budhwani KS et al described a series of ten cases with silent bowel perforation. [2] In 2008 Matsuoka H, Takegami T, Maruyama D et al descibed a case of 4 yr old child a case of myelomeningocele with hydrocephalus who had undergone repair of myelomeningoele and VP shunt later had bowel perforation with trans anal migration of shunt catheter and required duplication of ileum repair, closure of colonic fistula and shunt being changed to ventriculoatrial one [3]. In 2011 Hayama T, Ishihara S et al descibed a case where peritoneal catheter got severed spontaneously and perforated the sigmoid bowel and presented with anal protrusion [4]. In 1997 Adeloye Adesribed weak bowel musculature in myelomeningocele and the use of stiff peritoneal catheters a cause of silent bowel perforation and transanal protrusion and treated without any major abdominal surgery like our patient [5]. In 2000 Sathyanarayana S, Wylen EL et al described incidence of bowel perforation by shunt catheter to be 0.1% in their study of 45 cases [6]. In 2016 Sarkari A, Borkar SA, Mahapatra AK described in their series likely cause of bowel erosion as catheter tip adheres to the wall of viscera and a constant pressure of the abutting tip along with local inflammatory reaction leads to erosion of the visceral wall and entrance of tip in the lumen [7].

Our case report lays further emphases on this uncommon complication and poor bowel musculature can be a likely cause as reported in literature.

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