Case Report

A Rare Complication of Subdural-peritoneal Shunt: Migration of Catheter Components through the Pelvic Inlet into the Subdural Space

Mürteza Çakir, Atilla Yilmaz[1], Çağatay Çalikoğlu

Department of Neurosurgery, Atatürk University, Erzurum, [1]Department of Neurosurgery, Mustafa Kemal University, Hatay, Turkey

Abstract

Subdural-peritoneal (SP) shunting is a simple procedure to treat subdural hygromas; however, several rare complications such as shunt migration exist. A 15-year-old boy presented with headache, nausea, and vomiting , and underwent SP shunting for left frontoparietal chronic subdural effusion. Six weeks later, radiographic examinations revealed total migration of the shunt through the pelvic inlet. The migrated shunt was replaced with a new SP shunt. Four weeks later, radiographic examinations revealed shunt migration into the subdural space. The shunt catheter was removed and the subdural effusion was evacuated. Shunt migration may result from pressure differences between the abdomen and the cranium or from head movement, and insufficient fixation and/or large burr holes can facilitate shunt migration. Double firm anchoring and small-sized burr holes can prevent this complication. SP shunt is a simple procedure, and its assumed complications can be prevented through precaution.

Keywords: *Pelvic migration, shunt migration, subdural effusion, subdural migration, subdural-peritoneal shunt*

Introduction

Subdural hygroma (SH) or subdural effusion is an accumulation of cerebrospinal fluid (CSF) in the subdural space; CSF composition is often with modified.[1] Minor head trauma can separate the dura and arachnoid, thereby subsequently resulting in SH.[1,2]

Subdural-peritoneal (SP) shunting is a relatively simple procedure to treat SH.[3] Its complications include shunt obstruction, migration, and infection, insufficient drainage, excessive drainage, and intestinal complications. The most frequently reported complication is shunt obstruction.[4] Shunt migration, especially cranial migration, is very rarely observed.

Case Report

A 15-year-old boy was admitted to our outpatient clinic with the complaints of headache, nausea, and vomiting. He had no history of central nervous system infections or head trauma, and neurologic examination yielded normal findings. Brain computed tomography (CT) revealed a left frontoparietal chronic subdural effusion [Figure 1]. An SP shunt system was surgically placed, and he was discharged after 7 days [Figure 2].

Six weeks later, he was re-admitted to our outpatient clinic due to same complaints. Plane anterior-posterior abdominopelvic radiography revealed complete migration of the shunt through the pelvic inlet [Figure 3]. The migrated shunt was surgically removed and replaced with a new SP shunt, with adequate fixation.

Four weeks later, periodic control CT and plane anterior-posterior X-ray of the skull revealed complete migration of the shunt into the subdural space [Figures 4 and 5]. The previous incision was reopened, and the shunt catheter was removed from the subdural space. The dural incision was extended and the subdural effusion was evacuated by through-and-through irrigation with approximately 37°C physiological saline. After

Address for correspondence: Dr. Atilla Yilmaz, Department of Neurosurgery, Mustafa Kemal University, Hatay, Turkey.
E-mail: atillayilmaz@hotmail.com

How to cite this article: Çakir M, Yilmaz A, Çaliko□lu &. A rare complication of subdural-peritoneal shunt: Migration of catheter components through the pelvic inlet into the subdural space. J Pediatr Neurosci 2017;12:162-4.

Access this article online

Quick Response Code:

Website: www.pediatricneurosciences.com

DOI: 10.4103/jpn.JPN_180_16

evacuation, the internal membrane was opened, and the operation was terminated. Three months later, control magnetic resonance imaging did not reveal any effusion or occupying lesion in the subdural space [Figure 6].

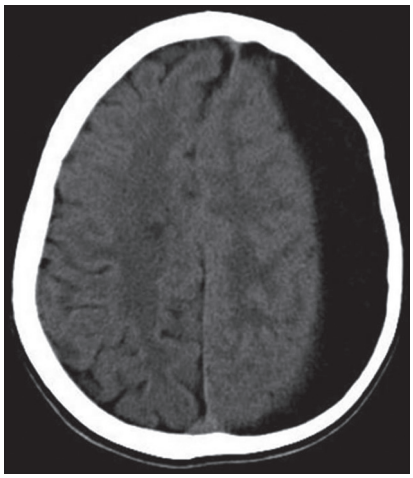

Figure 1: First admission image with left chronic subdural effusion

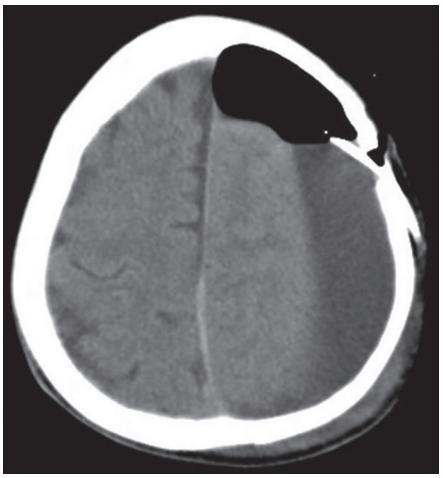

Figure 2: After the subduroperitoneal shunt placement surgery

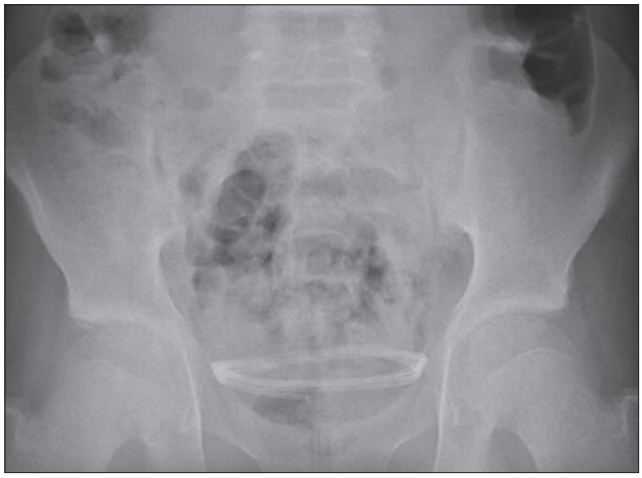

Figure 3: Control abdominal X-ray showing that the shunt material completely migrated into the pelvic inlet

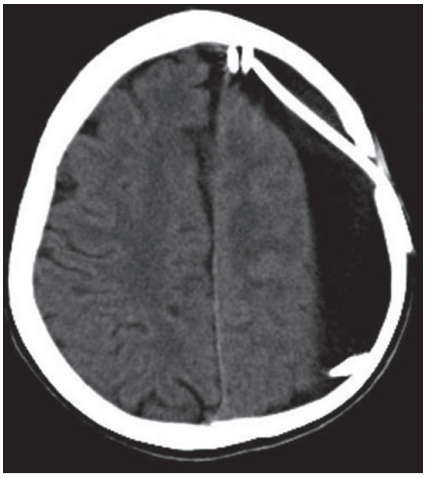

Figure 4: Control brain computed tomography scan showing that the shunt material completely migrated into the cranium

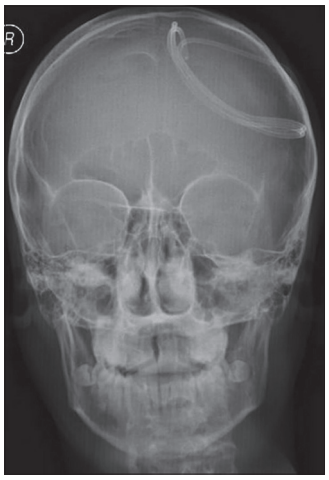

Figure 5: Control plane anterior-posterior X-ray of the skull showing that the shunt material completely migrated into the cranium

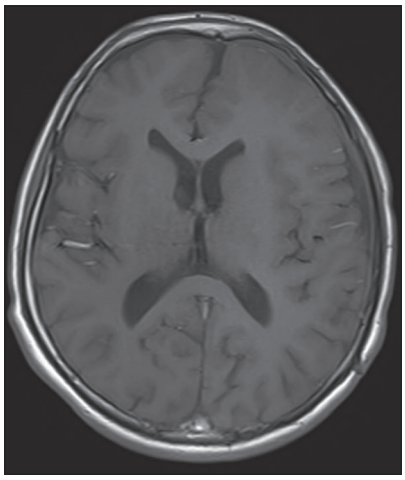

Figure 6: Three months later, control magnetic resonance imaging. After the surgical evacuation

Discussion

SHs usually occur in the frontal lobe and can be bilateral or unilateral. They occur frequently in infants. They comprise hemorrhagic and xhanthochromic components. Various methods such as subdural tapping, craniotomy and SP shunting[1,2,5] can be used to treat infantile SHs or hematomas. Shunt procedures seem sufficient and have lesser complications than other methods do; however, this does not eliminate the possibility of postoperative complications.

The most frequent complications of shunt surgery are obstruction[4] and infection, the occurrence of the latter reported between 3% and 7%.[6] Such other complications are intestinal complications, insufficient or excessive drainage, and catheter migration. Shunt catheter migration, especially upward migration to the subdural space or ventricle is extremely rare. We could not find any data on catheter migration through the pelvic inlet into the brain in the same patient.

Migration of the disconnected catheter into the abdominal cavity is more common, probably because of the upright posture and withdrawal by the intestinal movement.[7]

The mechanism of shunt migration can be correlated with pressure differences between the abdomen and the cranium, head movement, the short distance between the two, and posture.[8]

After the disconnection of the catheter, severe flexion and extension movement of the head may cause upward migration of the catheter.[9] Large burr-hole defect can facilitate catheter migration.

Upward catheter migration is more prevalent in infants due to the presence of loose subcutaneous tissue. They also remain in the recumbent posture almost throughout the day.[7,9]

Disconnection and migration of the catheter may depend on insufficient fixation or large burr-hole defects.[7] The use of double firm anchoring, one to the cranial periosteum and the other to the abdominal aponeurosis, and using an accurately sized burr hole defect can reduce the likelihood of this complication.

If the migrated shunt catheter remains in the subdural region, it should be left in place to avoid additional complications.[4]

Conclusion

SP shunt is a safe and simple alternative treatment for SH. Shunt migration is a rare complication and can be prevented by through precaution. The most significant precaution is a proper fixation with adequate suturing of the shunt components with nonabsorbable sutures. Although an extremely uncommon complication, both cranial and peritoneal migration of shunt can be seen in the same patient.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Lee KS. The pathogenesis and clinical significance of traumatic subdural hygroma. Brain Inj 1998;12:595-603.
2. Stone JL, Lang RG, Sugar O, Moody RA. Traumatic subdural hygroma. Neurosurgery 1981;8:542-50.
3. Van Schaeybroeck P, Vanlommel E, Lagae L, Van Calenbergh F, Casaer P, Plets C. Treatment of a symptomatic posterior fossa subdural effusion in a child. Childs Nerv Syst 1999;15:90-3.
4. Ersahin Y, Tabur E, Kocaman S, Mutluer S. Complications of subduroperitoneal shunting. Childs Nerv Syst 2000;16:433-6.
5. Gurdjian ES, Brihaye J, Christensen JC, Frowein S, Lindgren W, Luyendijk G. Glossary of neurotraumatology. About 200 neurotraumatological terms and their definitions in English, German, Spanish, and French. Acta Neurochir (Wien) 1979;25:1-63.
6. Litofsky NS, Raffel C, McComb JG. Management of symptomatic chronic extra-axial fluid collections in pediatric patients. Neurosurgery 1992;31:445-50.
7. Sunada I, Akano Y, Inoue T, Tamura K, Fu Y, Yamamoto S, *et al.* Migration of a subduroperitoneal shunt catheter into the subdural space – Case report. Neurol Med Chir (Tokyo) 1995;35:251-4.
8. Emel E, Karagöz Güzey F, Bas NS, Alatas I, Sel B, Fadillioglu S. Migration of subduroperitoneal shunt into the subdural space: An unusual complication. Pediatr Neurosurg 2005;41:115-6.
9. Erol FS, Akgun B. Subgaleal migration of the distal catheter of a ventriculoperitoneal shunt. Acta Medica (Hradec Kralove) 2009;52:77-9.