

Olgu Sunumu

Extrusion of the Ventricular Component of a Ventriculo-Peritoneal Shunt Into the Subgaleal Space: Case Report of an Unusual Complication

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Background: The migration of ventriculo-peritoneal (VP) shunt catheters used in the treatment of hydrocephalus is an infrequent complication which occurs without any recognizable cause.

Case report: An unusual case of ventricular catheter extrusion into the subgaleal area in a five-month-old hydrocephalic baby is presented. The event occurred nearly 3 months following the placement of a VP shunt. VP shunt revision was performed without any neurological deterioration, and the patient has been included in the clinical follow-up protocol.

Conclusion: In the literature ventricular end extrusion into the scalp has not been reported, so far. Although VP shunt application is very effective in treatment of hydrocephalus, it may cause unexpected complications.

Key words: Migration, shunt, ventriculoperitoneal, subgaleal coiling

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Ventrikülo-Peritoneal Şantın Ventriküler Ucunun Subgaleal Alana Ekstrüzyonu: Olgu sunumu

Giriş: Hidrosefali tedavisinde, belirgin bir neden olmaksızın ventrikülo-peritoneal (VP) şant kateter ucunun göçmesi ender görülen bir komplikasyondur.

Olgu sunumu: Beş aylık hidrosefalisi bulunan bebekte ender olarak görülen, ventrikülo - peritoneal şantın ventriküler kateter ucunun saçlı deride subgaleal alana çıkması olgusu sunulmuştur. Komplikasyon VP şant takılmasını takiben yaklaşık 3 ay sonra ortaya çıkmıştır. Hastaya herhangi bir nörolojik kötüleşme olmaksızın VP şant revizyonu ameliyatı uygulandı ve klinik takibe alındı.

Sonuç: Yalnızca ventriküler ucun yerinden saçlı derinin altına çıkması olgusu bugüne kadar literatürde rapor edilmemiştir. VP şant uygulamaları hidrosefali tedavisinde çok etkili olmakla birlikte öngörülemeyen komplikasyonlara neden olabilirler.

Anahtar kelimeler: Migrasyon, şant, ventriküloperitoneal, saçlı deri altına yumaklanma

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The migration of VP shunt catheters is an infrequent complication of the treatment for hydrocephalus which occurs without any recognizable cause ^(1,5). Many dif-

ferent types of unusual shunt migrations have been reported; Transdiaphragmatic migration can cause respiratory complications, tension hydrothorax, ventriculobronchial fistula formation⁽¹⁾, migration into the heart and pulmonary artery can cause cardiovascular problems⁽¹⁾, scalp migration, subcutaneous coiling of the peritoneal end, intraventricular migration of the peritoneal end, migration of both ventricular and peritoneal ends with subgaleal coiling^(1,3). In the literature pure ventricular end extrusion into the subgaleal space has not been reported.

A case of complete extrusion of a ventricular end of the shunt into subgaleal space in a hydrocephalic infant has been presented and possible etiological factor are discussed.

CASE REPORT

This baby girl was born at 42 weeks of gestation from a healthy mother. She had no health problem prenatally. The parents and family physician have noticed that the head diameter was increasing unusually. The patient was admitted to our department with the diagnosis of hydrocephalus. Computed tomography (CT) showed enlarged

cerebral ventricles. Subsequent hydrocephalus was treated by insertion of a VP shunt with a medium pressure valve through a right occipital burr hole (Figure 1a, and b).

She had normal routine neurologic examination during next three months. Thereafter she presented with decreased oral intake, vomiting and increasing lethargy and readmitted to the hospital. The skull X-ray revealed that entire length of ventricular catheter was coiled under the scalp (Figure 2). The valve and the peritoneal catheter had not moved from their original position. A cranial CT scan was also performed and showed the absence of an intraventricular catheter (Figure 3).

Shunt revision operation was performed. Post-operative cranial CT scan demonstrated that the ventricles shrank. The patient was discharged with normal neurologic examination.

DISCUSSION

Complete upward migration of a VP shunt is a very rare complication. There are very few publications in the literature, primarily involving valveless VP shunt systems. The reason is un-

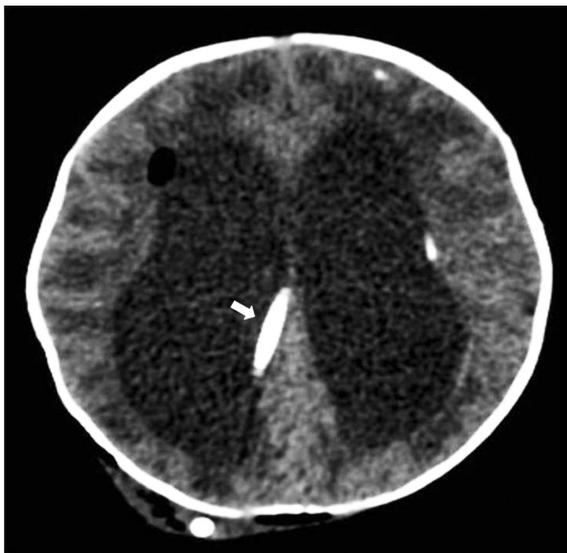


Figure 1a. Ventricular catheter (white arrow) is seen in the right ventricle on axial CT image.



Figure 1b. Ventricular catheter (white arrows) is seen in the ventricle on lateral skull X-ray.



Figure 2. Ventricular end of the VP shunt extrusion to the scalp (white arrow) is seen on lateral skull X- ray.

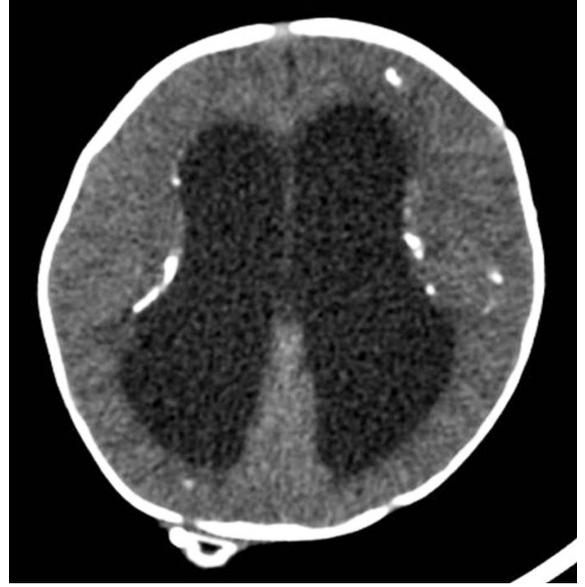


Figure 3. Ventricular catheter disappeared in the right ventricle on axial CT image.

known and is thought to be due to either negative pressure caused by reabsorption of subgaleal fluid or the windlass effect by repeated head motions ⁽¹⁻³⁾. We were not able to explain any specific cause of this kind of VP shunt movement. The same negative pressure caused by reabsorption of subgaleal fluid mechanism might be responsible for extrusion of ventricular end of the VP shunt in this case. Additionally, inadequate fixation of the catheter, a large burr hole or a capacious dural opening and large ventricles with a thin cortex might also permit migration ⁽⁴⁾.

Our VP shunt is made from silastic rubber which is flexible and softest of all the catheters used in the medical practice. It has a medium pressure valve system.

Distal VP shunt migrations are all common complications of shunting, but proximal extrusions are much less frequent. Total migration of the (VP) shunt with extrusion of the ventricular catheter as well as proximal migration of the peritoneal catheter into the sub-galeal space had reported previously ⁽¹⁾. But only ventricular end

extrusion to the scalp has not been reported up to now. Various hypotheses have been postulated to explain rear extrusion of a ventricular catheter.

In infants, we recommend mild fixation of the distal catheter to the peritoneum with a cerclage suture to prevent upward shunt migration. For the same reason it is advisable to fix the shunt at the burr hole side too. The burr hole and dural opening should not be too wide. Nonabsorbable suture material should be used for fixation the valve. The head dressing should be tightened mildly for the prevention of the formation of subgaleal fluid collection.

If the VP shunt system does not work adequately, subgaleal swelling may occur. Therefore, the VP shunt type should be properly chosen before the operation for each individual case.

Extrusion of the VP shunt catheter mandates removal and revision of the shunt promptly. Once the cerebrospinal fluid and blood cell counts prove absence of infection, the VP shunt can be renewed.

REFERENCES

1. **Dominguez CJ, Tyagi A, Hall G, Timothy J, Chumas PD.** Sub-galeal coiling of the proximal and distal components of a ventriculo-peritoneal shunt. An unusual complication and proposed mechanism. *Childs Nerv Syst* 2000;16(8):493-5.
<http://dx.doi.org/10.1007/PL00007294>
2. **Gan PY, Singhal A.** Complete upward migration of the peritoneal end of a ventriculoperitoneal shunt into the subgaleal space. *Pediatr Neurosurg* 2006;42(6):404-5.
<http://dx.doi.org/10.1159/000095575>
3. **Heim RC, Kaufman BA, Park TS.** Complete migration of peritoneal shunt tubing to the scalp. *Childs Nerv Syst* 1994;10(6):399-400.
<http://dx.doi.org/10.1007/BF00335131>
4. **Shimizu S, Mochizuki T, Nakayama K, Fujii K.** Visual field defects due to a shunt valve migrating into the cranium. *Acta Neurochir (Wien)* 2002;144(10):1055-6.
<http://dx.doi.org/10.1007/s00701-002-0990-x>
5. **Sinnadurai M, Winder MJ.** Silicone spaghetti. *J Clin Neurosci* 2009;16(10):1348-50.
<http://dx.doi.org/10.1016/j.jocn.2008.12.029>