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OLGU SUNUMU/CASE REPORT

Free floating ventricular shunt catheter in fourth ventricle

Dördüncü ventrikülde yerleşik olmayan ventriküler şant kateteri

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Abstract
Ventriculoperitonal shunt dysfunction can be a displeasing result after management of hydrocephalus. Proksimal tip malfunction of the system is rarely seen compared with distal catheter. Here we report a 6-month-old infant who was treated with ventriculoperitonal shunt system after the diagnosis of hydrocephalus at birth and presented with shunt dysfunction 6 months after the operation.
Key words: Hydrocephalus, ventriculoperitoneal shunt dysfunction, free catheter

Öz
Ventrikülöperitonal şant bozukluğu, hidrosefali yönetimi sonrasının istenmeyen bir sonucu olabilir. Sistemin proksimal uç bozukluğu, distal katetere kıyasla nadiren görülür. Burada doğumda hidrosefali teşhisi konulduktan sonra ventrikülöperitonal şant sistem tedavisi almış fakat operasyodan 6 ay sonra şant disfonksiyonu gelişen 6 aylık bir yenidoğanın durumu sunulmuştur.
Anahtar kelimeler: Hidrosefali, Ventrikülerperitonal şant bozukluğu, serbest kateter.

INTRODUCTION

Hydrocephalus is a disease that may affect any age group, characterized with excessive cerebrospinal fluid accumulation in cerebrum. It may have a high risk of mortality and morbidity unless treated properly. Ventriculoperitoneal shunt procedure is widely performed by neurosurgeons in childhood hydrocephalus. Complications related to mechanical dysfunction of shunt components and infections are common[1,2]. Proximal migration of ventriculoperitoneal shunt into the cranium is a rare condition comparing to it's distal catheter migration and some cases are reported in the literatüre[3,4,5,6].

On the other hand, following disconnection from valve, migration of ventricular part into 4th ventricle and it's unbound position in there, is a unique case that has not been reported before. In this study, we aimed to discuss a baby, treated with VP shunt system after the diagnosis of hydrocephalus at birth and presented with shunt dysfunction 6 months after the operation.

CASE

A 6-month-old male infant was admitted to our clinic with complaints of hypotonia and nausea. In the patient's medical history, he was treated with VP shunt system at birth with diagnosis of triventricular hydrocephalus. At the time of admission to us, there was the control cranial computed tomography (CT) examination of patient after initial surgery. On this CT examination, ventricular catheter was traced from left occipital region into the lateral ventricle (Figure 1).

In his neurological examination "Seeting sun sign" and frontal fontanel tenseness were identified. Other system examinations were normal. A control cranial CT examination was performed. On CT examination, ventricular catheter was seen unbound position and free floating in 4th ventricule (Figure 2). With the diagnosis of VP shunt dysfunction, patient was operated urgently to decrease intracranial pressure. Only distal catheter connection of valve was observed without any relation with ventricular catheter. Valve and distal catheter were

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excised and another VP shunt system was placed. Ventricular catheter of previous surgery was not removed from the 4th ventricle and follow up was planned. Patient was discharged without any problems at postop day 10.

Figure 1. On non-contrast axial brain CT scan, the ventricular catheter is seen on expected position at the early postoperative period.

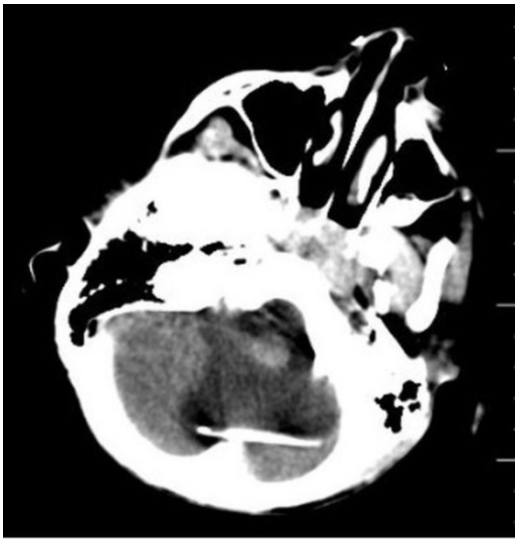

Figure 2. On non-contrast axial brain CT scan, free flaoting ventricular catheter was seen in the 4th ventricle.

DISCUSSION

Intracranial migration of VP shunt system components is a very rare complication[7,8]. This complication can be separated into two groups; proximal and distal migration. The mechanism of distal migration of VP shunts may be explained with pulsative effect of normal intestinal peristaltism. Proximal migration is more rare compared with distal migration. A few mechanisms were suggested for proximal migration. Such factors like, size of the burr hole and dural incision, type of the catheter, fixation technique, excessive head movement, excessive soft tissue dissection in the operation, increased intraabdominal pressure, may have possible roles in mechanism of proximal migration[3,4,6,9]. Supine position during breast-feeding and presence of loose subcutaneous tissue were assigned to be the causes of proximal migration[10,11,12]. Yamazaki et al, reported that, emplacement of valveless shunt systems and entry through an occipital burr hole were major factors in their 15 cases of proximal migration of VP shunt systems[6]. Mori et al. noticed the effect of wide burr hole and failure of catheter fixation on migration[13].

Possible cause of complication in our case seemed to be the fixation failure between the valve and ventricular catheter. Following disconnection of ventricular catheter from valve, intracerebral pulsations leaded catheter to migrate firstly into lateral ventricule and then into 4th ventricule through foramen of monro and aquaductus. Presence of large ventricule and thin cortex facilitated the process. Erol et al., defined a case that they observed a detached proximal end from valve and it's unbound position in between lateral ventricles [7].They accused vacuum effect of negative intracranial pressure and inattention during the surgery as possible causes of that complication.

Infection and epileptic seizures are the most serious complications of ventricular catheter; endoscopic excision of catheter may be required in such patients[6,7,14,15]. Our patient was presented with signs of intracranial hypertension due to shunt dysfunction. Unbound catheter inside the 4th ventricule had an inconvenient position for excision. Another ventriculoperitoneal shunt system was placed after the excision of valve and peritoneal catheter. Ventricular catheter of previous surgery left inside 4th ventricule but there were no problems during the follow up of patient.

In such patient groups with high risk of complication, shunt dysfunction may result with morbidity and mortality. Newborns are in the highest risk group for shunt revision surgery. It's very important to give high attention during

ventriculoperitoneal shunt procedure in order to avoid recurrent surgeries in hydrocephalus patients. We suggest that tight fixation of valve, ventricular and distal catheters with non-absorbable sutures is an effective way of decreasing the risk of migration problem although it's a rare complication.

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