Case Report

Aspergillus Growth within Ventriculoperitoneal Shunt Tube

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ABSTRACT

Cerebrospinal fluid (CSF) shunt failure is commonly associated with infection or mechanical obstruction of the shunt system. A 4-year-old male child who had undergone multiple shunt revisions at another hospital for congenital hydrocephalus and later for shunt obstruction, presented with exposed shunt at the supraclavicular region. Shunt revision was performed. The CSF culture showed no growth; however, the histopathological examination of shunt tube showed Aspergillus growth inside the lumen of silicone tube well away from the tip of ventriculoperitoneal shunt. The skin biopsy from the exposed site revealed foreign body giant cell granulomatous reaction. The patient was discharged on postoperative day 6 without any complications. At 3 months follow-up, the patient is doing well. A growth of Aspergillus within the shunt tube prompted us to think of how the hardware can get infected and may remain a source of constant infection.

KEYWORDS: Aspergillus, hydrocephalus, infection, ventriculoperitoneal shunt

INTRODUCTION

Ventriculoperitoneal shunt (VPS) surgery is commonly used technique for the management of hydrocephalus in pediatric cases. VPS-related complications may occur anywhere along its course from the ventricle cranially to the peritoneal cavity caudally. Patients treated with VPS, catheter-induced complications account for up to 70% of all hardware failures.[1] Allergy or hypersensitivity to latex or silicone is now emerging.[2] Extrusion of the peritoneal end of the shunt through intact skin over the abdominal end is extremely rare. Aspergillosis is a serious infection caused by the proliferation and invasion of hyphae in tissue.[3]

CASE REPORT

A 4-year-old male child presented to our institute with exposed shunt tube at supraclavicular fossa for 1 month [Figure 1 - inset]. The child had VPS for hydrocephalus at the age of 3, and the revision of shunt was done again at 5 months of age due to symptoms of increased intracranial pressure (ICP) due to malfunction of VPS. The exposed shunt showed no evidence of hyperemia of the skin or local swelling. The child had no history of fever or clinical features of meningitis. There were also no clinical features suggestive of raised ICP or any other neurological deficit.

In view of exposed shunt for more than 1 month, a decision to revise the shunt tube was taken. The shunt tube was removed, and a new VPS assembly was inserted on the contralateral side. A biopsy of the skin was taken from the exposed part, and the wound was allowed to heal with secondary intention. The biopsy of the skin showed foreign body giant cell granulomatous reaction. The cerebrospinal fluid (CSF) report showed 1 cell/mm³ (monocyte), sugar 62 mg/dl, protein 9 mg/dl, and the culture showed no growth of any microorganism. The histopathology report of scrape material obtained after slit opening, the abdominal end of shunt tube showed pure colony of fruiting bodies with acute branching septate fungi of Aspergillus [Figure 1], no inflammatory cells, or any tissue reaction was seen.

The patient was started on antifungal medications, and the patient was discharged on postoperative day 6. At 3 months follow-up, the patient is doing well.

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Aspergillus fumigatus. Successful treatment with voriconazole of fungus colony with branching septate microstructural alterations of silicone meningitis: Diagnosis by non-culture-based species is rare. This syndrome often manifests itself with fever and headache that may be present for several weeks before a diagnosis is established and meningitis may be present but is nonspecific. The child was not having any other complaints except exposure of the shunt tubing with skin dehiscence. The CSF findings were inconclusive because it was collected from the ventricular end after disconnecting it from the chamber. Thus, CSF may be sterile provided retrograde infection has not traveled as appeared in our case. Culture is the key to make the diagnosis, but in our case, the cultures did not detect it. The Aspergillus colony was only detected on pathological examination of shunt tubing. This explains that the patient may not be the source of infection but the shunt system got contaminated during the previous surgical procedure or due to exposure of shunt.

Various methods have been put forward to reduce the chances of catheter extrusion along the shunt tract. During subcutaneous tunneling, it is advisable to tunnel and bury the peritoneal catheter at a deeper level beneath the skin to avoid epidermal trauma which predisposes to subsequent focal skin infection, while simultaneously providing protection against dermal erosion by shunt components.[6]

**CONCLUSION**

Our case had no clinical evidence of infection. Patient’s hematological, liver and renal profile was normal, and there were no features suggestive of shunt tract infection or meningitis. It shows that the shunt tube may harbor some fungus without any clinical symptoms. It may be possible that the shunt infection may be in latent stage before clinical features were apparent. We could only pickup fungal colony on opening the lumen of the tube and scraping were subjected to histopathological examination. Biopsy from the skin around the exposed site did not reveal any fungal profile, only granulomatous inflammation was seen.

We recommend that in every case of malfunction of shunt where other routine causes are excluded, we need to open lumen and scraping to be done to look for fungal growth.

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**Conflicts of interest**

There are no conflicts of interest.

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