Hydrocephalus has been observed as one of the most common pediatric neurosurgical conditions [1]. Due to progressive nature, if not treated in time, hydrocephalus can lead to significant disability and mortality [2]. Globally hydrocephalus is most commonly and traditionally treated with cerebrospinal fluid diversion with ventriculoperitoneal (VP) shunt insertion [3]. Despite its effectiveness VP shunt placement has significant shunt device as well as disease related complications. Most commonly observed complications include shunt obstruction, infection, dislocation, breakage and functional failure such as overdrainage [4,5].

Endoscopic third ventriculostomy (ETV) is another method of treatment with the advantage of cost-effectiveness and also devoid of shunt device complications [6,7]. But due to its limitations of questionable effectiveness in certain etiologies, unavailability of expertise and requisite of advanced imaging make this modality less preferred choice of surgery [8,9].

Contrary to preexisting traditional shunt related studies, this study not only analyzed etiologies (Table 1) shunt complications and contributing factors but also observed shunt survival as well (Figure 2).
Emphasis to VP shunt survival was given to find median time to first shunt failure and various factors contributing to early shunt failure. This type of approach makes our study one of the uplifting reports newly added to the literature of pediatric hydrocephalus.

Elaborate use of Kaplan–Meier survival curves showed shunt failure rates of 18.58% and 20.35% at 1 year and 500 days, respectively. Miscellaneous factors contributing to early shunt failure such as certain etiologies of hydrocephalus, presence of meningitis, congenital anomalies (Figure 3), past history of mass lesion and mass excision, were identified.

An interesting observation was early shunt malfunction among children who were delivered via Caesarean sections as compared to those who were delivered via normal vaginal births. Though data for a number of patients’ mode of delivery were missing, this observation still encourages researchers to explore further whether mode of delivery impacts median time to shunt failure. This report also confirms that VP shunt insertion in children born preterm is still a huge challenge and burden of care due to increased complications.

All VP shunt procedures were performed in separate sessions after repairing midline defects and spinal dysraphism, which might have contributed to low rate of shunt complications in our study. The same observation was reported by Oktem et al. [10]. It should pave the way for neurosurgical centers to adopt this strategy in practice after carefully evaluating cost and feasibility. Interestingly, we also observed that strict aseptic surgical techniques and availability of expertise played a huge role in reducing the incidence of shunt malfunction.

Our study, despite being conducted in a developing country setting and owning certain shortcomings such as missing data and patients lost to follow up, is one of the few from the South Asian countries that comprehensively assessed numerous determinants of VP shunt survival in pediatric patients.

Based on our experience we encourage readers to establish rigorous periodic evaluation of post-shunt surgery status of patients and shunt function in outpatient setting, especially those at high risk for shunt failure. This will help in documentation of clinical progress and timely intervention. We hope that hydrocephalus and shunt research in future will avidly consider the impact of prematurity and congenital abnormalities on shunt survival.

References