



CODEN [USA]: IAJPB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4147506>Available online at: <http://www.iajps.com>

Research Article

**FREQUENCY AND PATTERN OF EARLY COMPLICATIONS
AFTER VENTRICULOSTOMY IN OBSTRUCTIVE
HYDROCEPHALUS**Dr. Fahaddis Ahmad Rana¹, Dr. Sehrish Fatima², Dr. Aeman Hyder³, Dr. Hina Anwer⁴

Article Received: August 2020

Accepted: September 2020

Published: October 2020

Abstract:

Introduction: Endoscopic techniques are being increasingly used in the management of various neurosurgical pathologies, in recent times. **Objectives:** The main objective of the study is to analyse the frequency and pattern of early complications after ventriculostomy in obstructive hydrocephalus. **Material and methods:** This retrospective study was conducted in Punjab Health Department during 2019 to 2020. Detailed history, examination and baseline investigations, including imaging; such as CT Scan in all patients, while MRI brain in those patients, who could afford were done. All the demographics were recorded on a predesigned proforma including name, age, gender and address. **Results:** ETV was done in eight cases only of obstructive hydrocephalus due to congenital aqueductal stenosis that were fulfilling the highly selective inclusion criteria out of 150 patients with obstructive hydrocephalus managed in our hospital, their age was ranging from one to six months with no apparent history of previous CNS infection or septicemia as a primary treatment for their disease. **Conclusion:** It is concluded that Endoscopic third ventriculostomy can be considered as a treatment modality of choice for obstructive hydrocephalus. Post-operative complications were minimal with only 1% mortality rate in our series.

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Please cite this article in press Fahaddis Ahmad Rana et al, *Frequency And Pattern Of Early Complications After Ventriculostomy In Obstructive Hydrocephalus.*, Indo Am. J. P. Sci, 2020; 07(10).

INTRODUCTION:

Endoscopic techniques are being increasingly used in the management of various neurosurgical pathologies, in recent times. Endoscopic third ventriculostomy (ETV) is well accepted for obstructive hydrocephalus of various etiologies. Success rate of ETV is poor in post-hemorrhagic, post-infective hydrocephalus. It is safe in properly selected cases. Good pre-operative planning, proper imaging, surgeons experience and good post-operative care help in improving results [1]. Ventriculostomy was introduced in the early 1900s. Walter E. Dandy used a primitive endoscope to perform choroid plexectomy in communicating hydrocephalus. He later introduced the sub-frontal approach for an open third ventriculostomy [2]. The high mortality rate of this approach prompted Dandy to adopt a different treatment. Obstructive hydrocephalus is one of the common conditions in hospital settings that require surgery. It is managed either by endoscopic third ventriculostomy (ETV) or by ventriculoperitoneal shunt (VPS) surgery. The morbidity of VPS surgery is very high [3].

Some patients even die following repeated shunt infection. The cost of shunt hardware, antibiotics the following infection, and increased hospital stay result in financial loss. Therefore, the economic burden of shunt infection is huge [4]. ETV is now considered a safe and effective treatment for obstructive hydrocephalus in selected patients. In addition, ETV has numerous potential benefits over the standard shunt procedure, which possesses its own set of inherent risks and complications; these include infection, slit ventricle syndrome, and mechanical malfunction [5].

Since Dandy's classification of hydrocephalus into communicating and non-communicating types and further refinements of the same, bypass procedures to overcome obstruction of the cerebrospinal fluid (CSF) pathways have been established. Ventriculoperitoneal and ventriculoatrial shunts have played a major role in the successful management of patients with hydrocephalus [6]. Insertion of a shunt is associated with a life-long risk of infection, as it is a foreign body, and despite technological advancements, there is a risk of shunt obstruction as well as over drainage that can

result in significant morbidity, needing frequent shunt revisions. [1],[2],[3],[4] The reported rate of shunt malfunction in the first year of placement is 30%, and thereafter it is about 10% per year. The cumulative risk of infection is about 20% per patient, with most centres reporting rates between 5 to 10% [7].

Objectives

The main objective of the study is to analyse the frequency and pattern of early complications after ventriculostomy in obstructive hydrocephalus.

MATERIAL AND METHODS:

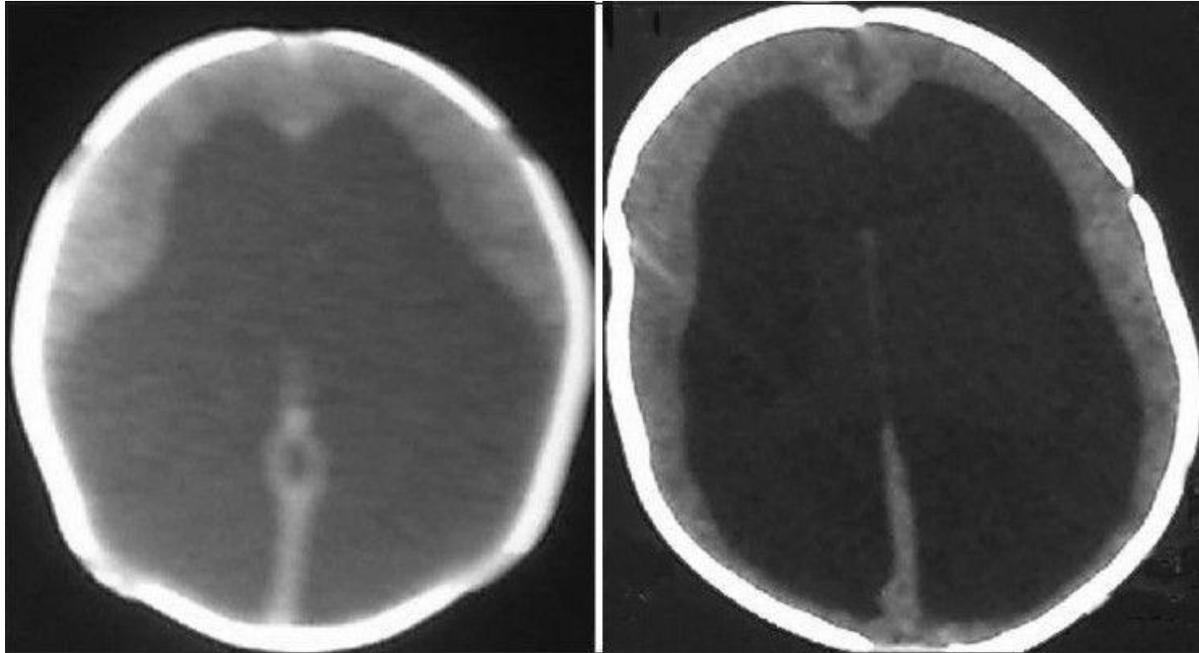
This retrospective study was conducted in Punjab Health Department during 2019 to 2020. Detailed history, examination and baseline investigations, including imaging; such as CT Scan in all patients, while MRI brain in those patients, who could afford were done. All the demographics were recorded on a predesigned proforma including name, age, gender and address. The patients were then followed up till 7 days' post operatively, for CSF leak, wound infection, meningitis, seizures, bleeding and in hospital death. Wound swab and CT scan Brain were carried out for the management of these complications.

Statistical analysis

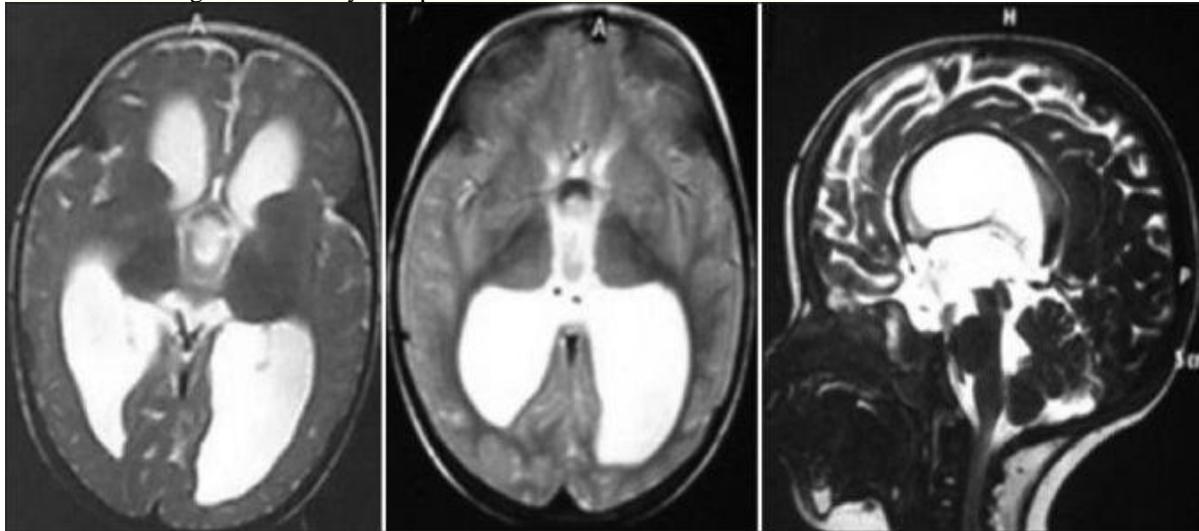
The data was collected and analysed using SPSS version 19. All the values were expressed in mean and standard deviation.

RESULTS:

ETV was done in eight cases only of obstructive hydrocephalus due to congenital aqueductal stenosis that were fulfilling the highly selective inclusion criteria out of 150 patients with obstructive hydrocephalus managed in our hospital, their age was ranging from one to six months with no apparent history of previous CNS infection or septicemia as a primary treatment for their disease. One case had CSF leakage five days after the procedure and was considered a sign of failure; accordingly VP-shunt was applied. Failure occurred within a period ranging from one week through six weeks with an average of 3.29 weeks. No cases of CNS infection as a complication of the procedure were detected. There was one mortality case after failure of ETV and applying a V-P shunt due to associated cardiac anomaly (atrial and ventricular septal defects).



CT brain showing obstructive hydrocephalus with dilated lateral ventricles



Control MRI 3 months after ETV, axial T2 cuts showing signal void in 3rd ventricular floor.

DISCUSSION:

Shunt placement, due to its effectiveness in the early postoperative period, has become a widespread method of treating both obstructive and non-obstructive hydrocephalus. However, the high frequency (20-80%) and seriousness of postoperative complications lead to a significant decrease in the quality of patients' lives. Each of these complications requires at least one surgical procedure for its treatment and can cause significant morbidity and mortality. Treatment of this morbid condition remains an unsolved problem in neurosurgery [8].

There have been several studies of the effectiveness of ETV in children under two years of age. Kadrian *et al.* reported a strong effect of patient age on outcome. They reported that the reliability of ETV in infants younger than one month was extremely low. The maximum observed reliability of ETV in this group was 3.5 years [9]. The authors reported the percentages of patients "presumed to have a functioning ETV after five years" as follows: 41% in patients one to six months old at the time of surgery, 58% in patients 6 to 24 months old, and more than 70% in patients older than 24 months. These results correspond to the data

reported by other authors. However, Javadpour *et al.* reported an ETV success rate of 33% (continued patency during follow-up in 7 of 21 patients) and found that success depended on etiology rather than on patient age [10-11].

CONCLUSION:

It is concluded that Endoscopic third ventriculostomy can be considered as a treatment modality of choice for obstructive hydrocephalus. Post-operative complications were minimal with only 1% mortality rate in our series.

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