

Distribution and Determinants of Endoscopic third ventriculostomy (ETV) at a Specialized Hospital in Dhaka City

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Received on: 24 July 2014; Reviewed on: 26 September 2014; Published on: 1 January 2015

Abstract

Background: Endoscopic third ventriculostomy (ETV) is the process of intra cranial CSF diversion to relieve the pressure inside the ventricles. This allows the cerebrospinal fluid to flow directly to the basal cisterns, thereby shortcutting any obstruction. It is used as an alternative to a cerebral shunt surgery. **Objectives:** To observe the Endoscopic third ventriculostomy (ETV) with causal factors and outcome. **Methodology:** The study was conducted in the Department of Neurosurgery in National Institute of Neurosciences (NINS) during the period from June, 2013 to August, 2014. All the study subjects included in the study were selected for endoscopic third ventriculostomy (ETV) following clinical and radiological diagnosis of hydrocephalus or raised ICP irrespective of age, sex and causal factors. The patients were followed post operatively to follow the outcome. **Result:** ETV was performed among 38 males and 35 females with a mean age of 24.67 years. Three major causal factors for ETV were aqueductal stenosis, posterior fossa SOL and CP angle tumour observed in 25 (34.3%), 22(30.2%), 11(15.1%) cases respectively. The successful ETV was done in 49 (67.1%) patients varied widely by diagnosis and patient age. Other 32.9% had suffered from several complications like local CSF drainage, local infection, meningitis and subarachnoid haemorrhage and treated conservatively. **Conclusion:** Endoscopic third ventriculostomy (ETV) is a safe and successful procedure in the management obstructive hydrocephalus. [J Natl Inst Neurosci Bangladesh 2015;1(1): 5-7]

Keywords: endoscopic third ventriculostomy (ETV), obstructive hydrocephalus, aqueductal stenosis.

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Conflict of interest: Authors declared no conflict of interest

Funding of the study: None

Contribution of the authors: SKSH, MAA & FAI have given the concept, manuscript editing, revising as well as intellectual thoughts. Rest of the authors as well as the other mentioned authors have contributed during surgery.

How to cite this article: Hossain SKS, Alamgir MA, Islam FA, Ekramullah SM, Mukharjee SK, Asadullah ATM, Alam SM, Kalimuddin, Haroon K, Ahmed MU, Huq M. Distribution and Determinants of Endoscopic third ventriculostomy (ETV) at a Specialized Hospital in Dhaka City, J Natl Inst Neurosci Bangladesh 2015;1(1): 5-7

Introduction

Endoscopic neurosurgery was first introduced in Bangladesh at 2005. Following the establishment of National Institute of Neurosciences (NINS) in Dhaka, Bangladesh the endoscopic Neurosurgery begins a new era. The procedure was first started here at June, 2013. Endoscopic third

ventriculostomy (ETV) is one of the major procedure had been done to reduce mortality or morbidity of the raised intracranial pressure (ICP) patients.

Endoscopic third ventriculostomy (ETV) is the process of intracranial CSF diversion to relieve the pressure inside the

ventricles. In this process a fenestration is made in the thinned floor of third ventricle which is an attempt to bypass the obstruction in the aqueduct of the Sylvius¹. The process is not a cure for hydrocephalus rather a process for an alternative to shunt surgery^{1,2}. The first open third ventriculostomy was done in 1922. One year later, mixer carried out first endoscopic procedure in neurosurgery by using a small ureteroscopy^{3,4}. Now a days rigid and fiber optic endoscopes both are used for ETV. In this Institute, rigid endoscopes are used for endoscopic procedures till date. The aim of this study was to observe the endoscopic third ventriculostomy (ETV) performed at NINS with causal factors and outcome of the patients.

Methodology

This was a retrospective study. The study was conducted in the Department of Neurosurgery at National Institute of Neurosciences (NINS) during the period from June, 2013 to August, 2014. All the study subjects included in the study were selected for endoscopic third ventriculostomy (ETV) following clinical and radiological diagnosis of hydrocephalus or raised ICP irrespective of age, sex and causal factors.

Results

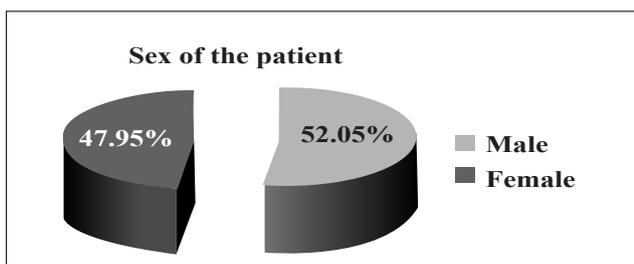
The majority of cases from 1-10 years comprised 17 (23.3%) cases, followed by 16 (21.9%) cases from 11-20 years and 14 cases (19.2%) from 21-30 years (Table 1).

Table 1: Age distribution of the patients (n= 73)

Age Group	Frequency	Percentage (%)
Below 1 year	4	5.5
1-10 years	17	23.3
11-20 years	16	21.9
21-30 years	14	19.2
31-40 years	7	9.6
41-50 years	5	6.8
51-60 years	9	12.3
61-70 years	1	1.4
Total	73	100.0

Among 73 study subjects, 38 (52.05%) were male and 35 (47.95%) were female (Table 2). The main causal factors for ETV were aqueductal stenosis (34.3%) and posterior fossa SOL (30.2%) (Table 3).

Table 2: Sex distribution of the patient (n=73)



Among 73 ETV cases 49 (67.1%) were functioning successfully. Other 24 cases had complications included

local CSF leakage in 12 (16.4%) cases, local infections were present in 10 (13.7%) cases. One case developed meningitis and other one developed sub arachnoid Haemorrhage postoperatively (Table 4).

Table 3: Distribution of causal factors of raised ICP (n=73)

Causal factors	Frequency	Percentage
Aqueductal stenosis	25	34.3
Posterior fossa SOL	22	30.2
CP angle Tumour	11	15.1
Cerebellar SOL	3	4.1
Ventricular Tumour	3	4.1
Shunt failure	4	5.4
Arachnoid cyst	4	5.4
Colloid cyst	1	1.4
Total	73	100.0

Discussion

In this study male female ratio was 1.08. Majority of the patients were from first three decades of life. The highest number of patients were 17 (23.3%) from 1-10 years of age. There were 4 (5.5%) patients below 1 year of age. ETV is common in children in treatment of hydrocephalus¹.

Table 4: Outcome following ETV (n=73)

Outcome	Frequency	Percentage
Functioning ETV	49	67.1
Complications		
Local CSF leakage	12	16.4
Local infection	10	13.7
Meningitis	1	1.4
Sub arachnoid Haemorrhage	1	1.4
Total	73	100.0

The wide range of acceptance of ETV in treatment of Hydrocephalus⁵. ETV is a short duration, noninvasive procedure. Obstructive hydrocephalus is the main indication for endoscopic third ventriculostomy, but this procedure is also currently used to treat a wide range of hydrocephalic patients. It is generally considered that aqueductal stenosis is a precursor to non-communicating hydrocephalus, as the blockage of the aqueduct would result in the accumulation of CSF seen in hydrocephalus. Aqueductal stenosis can be developed by tumour compression also⁶. Analysis of the preliminary results from this retrospective study conducted in a significant number of patients' shows that endoscopic third ventriculostomy is a feasible and safe method of treating hydrocephalus associated with posterior fossa tumors. When performed before posterior fossa surgery, it had both a curative effect on intracranial hypertension and a prophylactic effect by preventing the development of hydrocephalus after tumor removal⁷.

According to several studies several complications may arise specific to ETV including bradycardia and asystole, visual obstruction, damage of ventricles, vascular systems and fornices which were not observed in this study⁸. Current study revealed no such complications rather several general

complications regarding ETV were observed included infection, meningitis, sub arachnoid haemorrhage, CSF leakage. The patients were treated conservatively and recovered well.

Previously ventriculo peritoneal shunting was done to reduce raised intra cranial pressure. Hydrocephalus was treated through VP shunt. But the complications of the shunt ranging from infection, mechanical shunt blockage, shunt malfunction, over drainage or under drainage of CSF fluid, shunt extrusion through the skin even through rectum⁹⁻¹⁰. Success rate of ETV depends upon Surgeon's good knowledge of third ventricle anatomy and experience with endoscopic surgery. High Success Rate (>75%) observed post operatively in aqueductal stenosis, tumoural mass cases¹¹. Current study revealed overall success rate was 67.1%.

Conclusion

Though the study has been conducted in 1 year period and success rate was 67.1% post operatively. Further follow up required for full assessment of functioning Endoscopic third ventriculostomy (ETV).

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