Management of Hydrocephalus – Our Experience.

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ABSTRACT

INTRODUCTION: CSF diversionary surgery still remains one of the most common procedures in surgical neurology. Cerebrospinal fluid (CSF) diversion procedures remain the principal method of treatment of hydrocephalus. Commonly used procedures are Ventriculo-Peritoneal shunt, Endoscopic third ventriculostomy and External ventricular drainage. The objective was to analyze incidence, indications, and complications related to VP Shunt.

METHODE: This is a retrospective study carried out at National Neurosurgical Referral Center, National Academy of Medical sciences during the year September 2006 to September 2009 (3 Years). Demographic features like age, sex were analyzed. Other features like indications, complications and mortality/morbidity also analyzed.

RESULT: VP Shunt was performed in 272 cases. VP Shunt was performed for Congenital Hydrocephalus (29.8%), Tumour (32.7%), post infection (17.6%), Haemorrhage, Infarction (16.5%) and in 3.3% for other causes like abscess and granulomatous lesion. Shunt obstruction (10.3%) was common among the complications, followed by infection (6.25%).

CONCLUSION: CSF diversionary procedures still remains one of the most common procedures (11.5% of total surgeries). VP Shunt was performed in majority of cases of hydrocephalus (61.4%) followed by EVD in 30%, Endoscopic procedures in 7.45% and other procedures 2.3%. So, VP Shunt still remains most commonly used shunt in modern era.

KEYWORDS: hydrocephalus, vp shunt

INTRODUCTION

Ventriculoperitoneal (VP) Shunt procedure is commonest form of the CSF diversion procedures for hydrocephalus. It involves the placement of a ventricular catheter (a tube made of silastic), into the cerebral ventricles to bypass the flow obstruction/malfunctioning arachnoidal granulations and drain the excess fluid into other body cavities, from where it can be resorbed. Most shunts drain the fluid into the peritoneal cavity (ventriculo-peritoneal shunt), but alternative sites include the right atrium (ventriculo-atrial shunt), and pleural cavity (ventriculo-pleural shunt). In 1908 - The first VP shunt placement procedure is credited to Kausch in 1908, although the outcome was unfavorable and the procedure did not become widely performed for more than 50 years. 

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Placement of a VP shunt is now the most common surgical treatment for hydrocephalus. The historical aspects in this field has been documented by Enchev and Oi. Surgery for hydrocephalus is one of the most common neurosurgical procedures done in any neurosurgical setup worldwide

METHODE

This is a retrospective study, carried out between September 2006 to September 2009 at National Neurosurgical Referral Center, National Academy of Medical Sciences, Bir Hospital. All patients requiring VP Shunt procedure were included. Demographic features like, age, sex were analyzed. Other features like the indication for VP Shunt, shunt related complications and outcome were also assessed in this study.

RESULTS

The total number of procedure performed was 272 with predominantly males (144 cases) followed...
DISCUSSION

Hydrocephalus can be defined broadly as a disturbance of formation, flow, or absorption of cerebrospinal fluid (CSF) that leads to an increase in volume occupied by this fluid in the CNS. This condition also could be termed a hydrodynamic disorder of CSF. Acute hydrocephalus occurs over days, subacute hydrocephalus occurs over weeks, and chronic hydrocephalus occurs over months or years. Conditions such as cerebral atrophy and focal destructive lesions also lead to an abnormal increase of CSF in CNS. In these situations, loss of cerebral tissue leaves a vacant space that is filled passively with CSF. Such conditions are not the result of a hydrodynamic disorder and therefore are not classified as hydrocephalus. An older misnomer used to describe these conditions was hydrocephalus ex vacuo. Normal pressure hydrocephalus (NPH) describes a condition that rarely occurs in patients younger than 60 years. Enlarged ventricles and normal CSF pressure at lumbar puncture (LP) in the absence of papilledema led to the term NPH. However, intermittent intracranial hypertension has been noted during monitoring of patients in whom NPH is suspected, usually at night. The classic Hakim triad of symptoms includes gait apraxia, incontinence, and dementia. Headache is not a typical symptom in NPH.

Communicating hydrocephalus occurs when full communication occurs between the ventricles and subarachnoid space. It is caused by overproduction of CSF (rarely), defective absorption of CSF (most often), or venous drainage insufficiency (occasionally). Noncommunicating hydrocephalus occurs when CSF flow is obstructed within the ventricular system or in its outlets to the arachnoid space, resulting in impairment of the CSF from the ventricular to the subarachnoid space. The most common form of noncommunicating hydrocephalus is obstructive and is caused by intraventricular or extraventricular mass-occupying lesions that disrupt the ventricular anatomy. Congenital hydrocephalus applies to the ventriculomegaly that develops in the fetal and infancy periods, often associated with macrocephaly. The most common causes of congenital hydrocephalus are obstruction of the cerebral aqueduct flow, Arnold-Chiari malformation or Dandy-Walker malformation. These patients may stabilize in later years due to compensatory mechanisms but may decompensate, especially following minor head injuries. During these...
decompensations, determining the extent to which any new neurological deficits may be due to the new acute event, compared with hydrocephalus that may have gone unnoticed for many years, is difficult.

Frequency in United States for congenital hydrocephalus is 3 per 1,000 live births; the incidence of acquired hydrocephalus is not known exactly due to the variety of disorders that may cause it.

Internationally, Incidence of acquired hydrocephalus is unknown. About 100,000 shunts are implanted each year in the developed countries, but little information is available for other countries.

In untreated hydrocephalus, death may occur by tonsillar herniation secondary to raised ICP with compression of the brain stem and subsequent respiratory arrest. Shunt dependence occurs in 75% of all cases of treated hydrocephalus and in 50% of children with communicating hydrocephalus. Patients are hospitalized for scheduled shunt revisions or for treatment of shunt complications or shunt failure. Poor development of cognitive function in infants and children, or loss of cognitive function in adults, can complicate untreated hydrocephalus. It may persist after treatment. Visual loss can complicate untreated hydrocephalus and may persist after treatment.

Generally, incidence is equal in males and females. The exception is Bickers-Adams syndrome, an X-linked hydrocephalus transmitted by females and manifested in males. NPH has a slight male preponderance. Incidence of human hydrocephalus presents a bimodal age curve. One peak occurs in infancy and is related to the various forms of congenital malformations. Another peak occurs in adulthood, mostly resulting from NPH. Adult hydrocephalus represents approximately 40% of total cases of hydrocephalus.

Surgical treatment is the preferred therapeutic option. Shunts eventually are performed in most patients. Only about 25% of patients with hydrocephalus are treated successfully without shunt placement. The principle of shunting is to establish a communication between the CSF (ventricular or lumbar) and a drainage cavity (peritoneum, right atrium, pleura). A ventriculoperitoneal (VP) shunt is used most commonly. The lateral ventricle is the usual proximal location. The advantage of this shunt is that the need to lengthen the catheter with growth may be obviated by using a long peritoneal catheter.

CONCLUSION

VP Shunt procedure is commonest form of the CSF diversion procedures for hydrocephalus.

REFERENCES

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