HYDROCEPHALIC CHILDREN IN A DEVELOPING COUNTRY ANALYSIS OF SHUNT INFECTIONS AND CRANIOSYNOSTOSIS AS WELL AS THE ENDOSCOPIC MANAGEMENT OF JUVENILE MACROCEPHALLY: A 8 YEAR REVIEW

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SUMMARY

The outcome of hydrocephalus is determined by the etiology, the presence or absence of associated anomalies of the brain, and the timeliness of diagnosis and treatment. This study was done to know the epidemiology of hydrocephalus patient as it is observed in this region, the complication associated with shunt procedures for hydrocephalus and to find the relationship between shunt infections and craniosynostosis. Juvenile patients with microcephaly and hydrocephalus are rare in developed countries. We report a series of patients (n=20) presenting late with sign and symptoms of unstable hydrocephalus in “big headed” children managed with free hand third ventriculostomies.

INTRODUCTION

Attitude of parents towards modern medicine is another major factor contributing to the outcome of treatment as compared to that of many other centers. Their strong belief in traditional (faith) healers results in late presentation and refusal towards treatment offered. It is not uncommon to find a patient with huge hydrocephalus due to parents refusal for surgery. Epidemiological trends and etiologies have previously been investigated in a population-based studies on infantile hydrocephalus in other centres.

MATERIALS AND METHODS

The list of patients were delivered from the Record Office’s computer, to include all patients listed under ICD-9:742.3 (Hydrocephalus). All the short listed records were traced and relevant informations were extracted. Only those patients who have had operation (Ventriculoperitoneal shunt) were included in this study. All patients with microcephaly were followup after third ventriculostomy within a three year period. These patients were those between the ages of three to 18 years who were diagnosed to have hydrocephalus due to aqueduct stenosis, who refused operation when initially detected under the age of 1 year and presented to our service due to sign and symptoms of headaches, vomiting, visual deterioration and gait disturbances after a history of trauma, cranial infection or unknown causes. The patients were managed with third ventriculostomy were done freehand after a CT Scan of the brain which indicated evidence of aqueduct stenosis. Followup were done three monthly clinically and six monthly with CT Scan and magnetic resonance imaging.
RESULTS

During the period studied; from January 1990 to December 1998, there were 285 patients (new cases) admitted to the Hospital Universiti Sains Malaysia with a diagnosis of hydrocephalus. There was a male preponderance (1.7:1) in this study. 257 (90%) patients were Malays, 15(5.3%) were Chinese and 1(4.7%) Indian.

Among those who underwent primary insertion of the ventriculoperitoneal shunt, 14(4.9%) patients were associated with craniospinal myelomeningocele or encephaloceles. All of them underwent repair. In ten cases, repair of myelomeningocele and encephaloceles were done earlier (before ventriculoperitoneal shunt) due to cerebrospinal fluid leakage. Ventriculoperitoneal shunt was done in these patients 2 weeks later when hydrocephalus was noted. The other four cases, repair of myelomeningocele was done together with ventriculoperitoneal shunt. No shunt infection was related to myelomeningocele or encephaloceles repair procedure. 228 (80%) received medium pressure pediatric shunts: 29 (10.1%) received low pressure and 28 (9.9%) received high pressure shunts. Shunts were the unitized type for all shunt pressure from Radionics®, Medtronics® or Baxter®. Only 29 cases (10%) received the Delta shunt® from Medtronics. These were no significant different in all three shunts systems and operative complications.

Shunt infection from primary shunt insertion were recorded in 10 (3.5%) patients. Most of them presented with pus discharge from the scalp wound or from the abdominal wound. Blocked ventriculoperitoneal shunts recorded in 35 (12.2%) patients over a mean followup of a 5 years period.

Meningitis were recorded clinically in 36 (12.6%) patients. Five patients (1.8%) recorded to have peritonitis or septicemia associated with shunt infections. Most of the shunt infection was seen in a group of less than 6 months old. Out of 10 (3.5%) cases, 3 (1%) were patients from age to 1 months and 7(2.4%) from age 2 to 3 months respectively.

All ten cases which were associated with wound dehiscence or scalp necrosis postoperatively. In 5 cases (1.8%) there were extraperitoneal migration problems of the peritoneal catheter in the scrotum (two cases), rectum (one cases), extravaginal (one cases) and right supradiaphyrgamatic pleural cavity effusion. Out of 10 shunt infections the pathogens which was cultured were: Staphylococcus Aureus in 9 (3.2%) of patients and Pseudomonas Aeruginosa were recorded in 1 (0.3%) patient.

A follow-up period of more than 6 month was obtained for 65 patients, and 4 years for 114 patients and 8 years for 106 patients. 18 (6.3%) of the patients died during the follow-up. All cases of death were attributed to sudden death. No autopsies were done in these eighteen cases.
These cases had abnormalities around the brain stem such as Dandy Walker Syndrome or its variant.

Post operative craniosynostosis were seen in 29 cases (10%) of which 12 (4.2%) were plagiocephaly, 10 (3.5%) were turricephaly and in seven, other forms of cranial abnormalities. This pathology were noted at a mean internal of 4 months after ventriculo peritoneal shunt. 26 cases (90%) were due to unitized medium pressure shunts from various manufacturers and 3 (10%) were from low pressure shunts. In about 50% of these patients, third ventriculostomy gave a cure, in another 25% patients reported an improvement and another 25% had no improvement and required further ventriculo-peritoneal shunting. There were no mortalities and there was a 2% infection rate (meningitis). We noticed that patients who had a past history of infection with meningitis requires further shunting. Those with history of trauma of unknown causes could be managed with third ventriculostomies.

**CONCLUSIONS**

Ventriculoperitoneal shunts of done carefully will reduce shunt infection rates. Large hydrocephalus with thin skin causes wound dehiscence easily. Congenital hydrocephalus patients with fossa posterior abnormalities may died suddenly. Secondary craniosynostosis are unknown and not related directly to shunt pressures. Third ventriculostomies should be a first choice of treatment of unstable hydrocephalus and megacephaly in late presenting juvenile patients diagnosed with aqueduct stenosis where the “stable” hydrocephalus become unstable due to trauma, infection or other causes in countries where this pathology is commonly seen.
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