and third ventriculomegaly is debatable.

cerebrospinal fluid (CSF) pressure must be controlled medically or surgically without the narrow aqueduct of Sylvius (3). In the presence of papilledema, increased secondary to inadequate flow from the third ventricles into the fourth ventricle through (2, 3), which are caused by increased pressure in the lateral and third ventricles, Approximately 50% of adult AS patients (> 16 years old) are noted to have headaches gait disturbance, cognitive dysfunction, urinary incontinence, and seizures (1, 2).

COMMON SIGNS AND SYMPTOMS OF THE IDIOPATHIC AQUEDUCTAL STENOSIS (AS) ARE HEADACHES, INTRACRANIAL PRESSURE;

INTRODUCTION

Common signs and symptoms of the idiopathic aqueductal stenosis (AS) are headaches, CSF pressure reaches the level above the compensatory threshold, and headaches developed. The headaches that occur after long distance running in a patient with dilated lateral and third ventricles should be considered as hydrocephalic in nature. The third ventriculostomy was the procedure of choice in our case with aqueductal stenosis.

CASE PRESENTATION

A 16-year-old boy presented with a 6-month history of intermittent headaches that always followed 3 km running. Three years earlier, incidental ventriculomegaly was found by CT scan after minor head trauma. He remained asymptomatic, and annual MRI showed unchanged ventricular size and shape. However, while participating in the running training at the age of 15, he experienced an occipital headache, and he barely reached the 3-km goal. After passing the goal, he developed severe headache, extending to the entire head, and lost his ability to concentrate. He rested for 30 minutes before the headache subsided. There were no overt signs of increased ICP. Non-steroidal anti-inflammatory drugs (NSAIDs) and Triptans (tryptophan) failed to control such headaches. We postulated that the headaches reflected the sub-threshold ICP during his running -induced headaches in aqueductal stenosis patient

Surgical Findings

The endoscope was inserted into the right lateral ventricle, and then into the third ventricle through the dilated foramen of Monro. Posteriorly, the rostral end of the aqueduct was noted to be narrow (Fig. 1A). A very thin third ventricle floor (less than 10 mm thick) was penetrated by cautery. Through a 5 mm-long opening (Fig. 2c), CSF flowed readily into the basal and chiasmatic cisterns (Fig. 2d arrow). Two months after surgery, MRI showed significant decrease in size of the lateral and third ventricles, and clearly identified all the sulci (Fig. 3). Cine-MRI showed CSF flow from the third ventricle into the chiasmatic cistern, and the interpeduncular and preopticine cistern (Fig. 3 white arrows).

Discussion

In conclusion, the mechanism of running-induced headaches is analyzed. In the early human life, the balance between the ICP and volume is maintained by adaptive mechanisms. During infancy, the skull size increase is determined by the brain size, while the cranial sutures are slowly closing. It is postulated that the expansile force against the skull exerts by the growing brain and meninges accelerates skull expansion. This may be explained by activation of intra-cellular bone growth resultant positive feedback receptors in meninges cellular in response to increasing pressure (4). The skull expansion probably prevents ventricular enlargement, even under increased CSF pressure. After skull growth becomes slow and the suture closure is almost completed, compensation to increased CSF pressure is effected by suppression of CSF production and an increase in CSF absorption through the Pachionian granulations. However, as the AS pressure reached the level above the compensatory threshold, and headaches developed.

CONCLUSION

The headaches that occur after long distance running in a patient with dilated lateral and third ventricles should be considered as hydrocephalic in nature. The third ventriculostomy was the procedure of choice in our case with aqueductal stenosis.

REFERENCES


Running–induced headaches in aqueductal stenosis patient
Shoko M. Yamada, MD, DMsc 1 Akira Matsuno, MD, MSc1, Shokei Yamada, MD, PhD 2
1. Department of Neurosurgery, Teikyo University Chiba Medical Center, Ichihara, Japan
2. Department of Neurosurgery, Loma Linda University, Loma Linda, USA,