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Case Report

Cerebellar infarction complicated with acute hydrocephalus

Rohadi M. Rosyidi*, Bambang Priyanto

Department of Neurosurgery, Medical Faculty of Mataram University, West Nusa Tenggara General Hospital, Mataram, Indonesia

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***Correspondence:**

Dr. Rohadi M. Rosyidi,

E-mail: rha.ns2010@gmail.com

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ABSTRACT

Acute hydrocephalus is a rare manifestation of posterior circulation strokes. Clinical worsening and coma may occur in addition to these symptoms of cerebellar dysfunction. Timely and careful approach will certainly prove to be life saving when deciding for a shunt procedure in a patient developing obstructive hydrocephalus following cerebellar infarct. The case presented here is a reminder for both this rare complication, and the treatment approach. We present a patient with cerebellar infarct and secondary obstructive hydrocephalus. Forty three year old male patient was brought to the emergency room in our hospital with unconsciousness, before that patient with suddenly developing dizziness, loss of balance and vomiting. His neurological examination showed that he was coma. The patient's brain computed tomography scan showed severe third and lateral ventricular dilation suggestive of obstructive hydrocephalus. Following shunt placement and suboccipital decompression, the patient recovered and was able to walk without assistance. Cerebellar infarcts may cause death as a result of pressure increase in the posterior fossa and pressure on the brain stem due to edema. Moreover, the aqueductus or the fourth ventricle may close because of edema and cause obstructive hydrocephalus and acute intracranial pressure increase. Temporary external ventricular drainage or permanent shunt systems and surgical decompression of the posterior fossa may be considered to prevent progressive neurologic worsening. In conclusion, we wished to point out that a timely surgical procedure in a cerebellar infarct case where acute hydrocephalus developed could be life saving.

Keywords: Cerebellar infarction, Hydrocephalus non communican, Life saving, Posterior circulation strokes, Suboccipital decompression, Surgery, Ventriculoperitoneal shunt

INTRODUCTION

Occlusion of the vertebrobasilar artery and its branches can produce a massive cerebellar lesion.¹ Edematous swelling resulting from ischemia is usually responsible for the formation of such a lesion. Sometimes, fragmentation and movement of an embolus results in reflow of blood into damaged vessels, and hemorrhage occurs in the infarcted area.²⁻⁵ Cerebellar infarction and associated brain edema due to brainstem compression or obstructive hydrocephalus causes consciousness disturbance. The main complaints and findings seen in cerebellar infarcts are ataxia, vertigo, dysarthria, nausea,

vomiting and headache.^{1,2,5} Clinical worsening and coma may occur in addition to these symptoms of cerebellar dysfunction. This may occasionally result from reversible causes including development of hydrocephalus, brain stem compression.^{2,5} Timely and careful approach will certainly prove to be life-saving when deciding for a shunt procedure in a patient developing obstructive hydrocephalus following cerebellar infarct. The mortality rate when Decompressive Suboccipital Craniectomy (DSC) is not performed is reported to be 84%. The case presented here is a reminder for both this rare complication, and the treatment approach.¹⁻⁵

CASE REPORT

Forty-three-year-old male patient was brought to the emergency room in our hospital with unconsciousness, before that patient with suddenly developing dizziness, loss of balance and vomiting. His neurological examination showed that he was coma. Babinsky response was positive on the left. There was nothing of interest in his medical history or his family history. Blood chemistry (AST, ALT, urea, creatinine, electrolytes, cholesterol levels, triglycerides, and complete blood count were found to be within normal range. The patient's consciousness deteriorated progressively after 24hours. Brain CT scan was repeated when the Glasgow coma scale score decreased to 5/15, and infarct hydrocephalus was detected. CT scan showed that acute hydrocephalus with infarct area in the left cerebellar hemisphere, around Vermis Cerebellar (Figure 1). The patient's brain computed tomography scan showed severe third and lateral ventricular dilation suggestive of obstructive hydrocephalus.

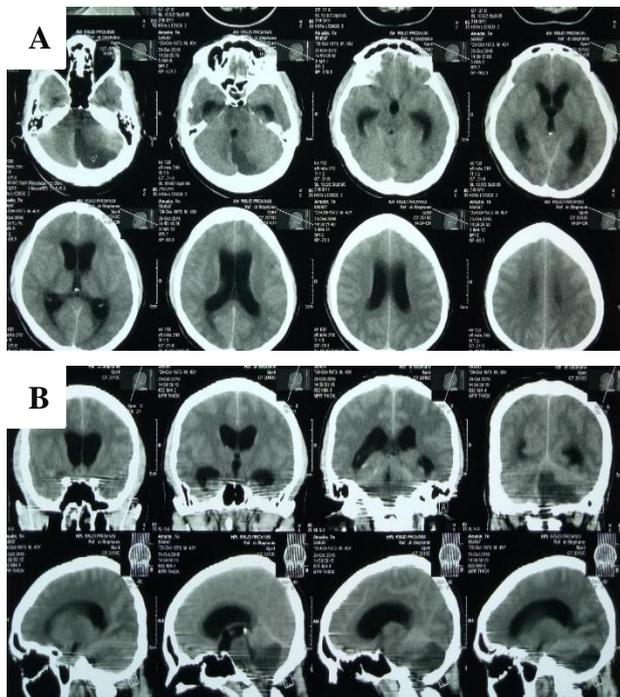


Figure 1: Head CT scan with contrast. A) Axial section. B) Coronal-sagittal section: obstructive hydrocephalus and infarct area in left cerebellar hemisphere.

Patients received surgical intervention in as soon as possible consists of permanent shunt systems, decompressive suboccipital craniectomy (DSC) of the posterior fossa and early tracheostomy may be considered to prevent progressive neurologic worsening (Figure 2).

The Procedure has success in these patients, after surgery our patients are admitted to the ICU for 1 week. He tolerated the procedure well, quickly improved clinical

condition, and the patient recovered and was able to walk without assistance. The patient was discharged home in stable condition. One Month post operative head CT Scan imaging demonstrated ventricular size diminished in a case and encephalomalacia in infarct area (Figure 3).

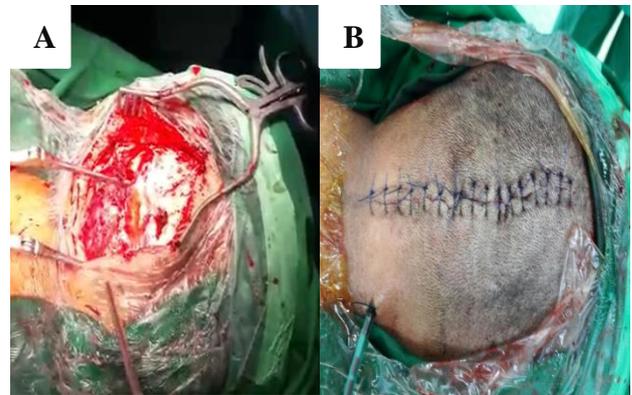


Figure 2: Decompressive suboccipital craniectomy (DSC). A) during the operation. B) Skin suture after surgery, large decompression in suboccipital region.

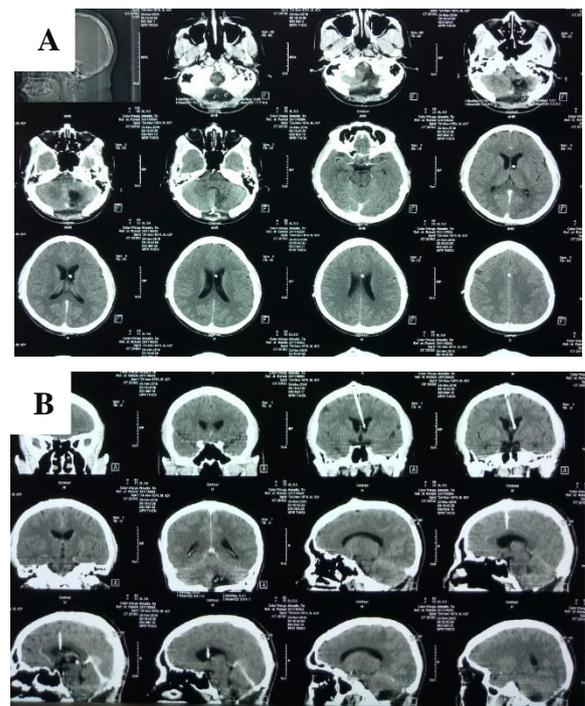


Figure 3: Head CT scan with contrast. A) Axial section. B) Coronal-sagittal section: ventricular size diminished in a case and encephalomalacia in infarct area.

DISCUSSION

A serious and immediate threat to life from infarction in the vertebrobasilar territory is usually caused by brain-stem infarction extensive enough to lead rapidly to coma or by brain-stem compression from a cerebellar mass lesion.^{1,2,6-8} The clinical and imaging features of patients

with cerebellar stroke can be helpful in clinical decision making. No single clinical or imaging finding can be used in isolation when deciding whether to use aggressive surgical management or to with hold such therapy.^{1,2,8,9} During the patient's first week in the hospital, observation in a neurologic intensive care unit may facilitate the timely recognition of neurologic deterioration and permit immediate repeated imaging to guide an appropriate and tailored surgical approach.^{1,10,11}

Cerebellar infarcts may cause death as a result of pressure increase in the posterior fossa and pressure on the brain stem due to edema. Moreover, the aqueductus or the fourth ventricle may close because of edema and cause obstructive hydrocephalus and acute intracranial pressure increase. Mortality is reported to be 5-23% in cerebellar infarct cases.^{1-3,12-14} Death occurs as a result of pressure on the brain stem and cardiac arrest. As shown in the repeated brain CT scans of our patient, acutely developing hydrocephalus is the cause of worsening in the clinical picture.

Therefore, patients with cerebellar infarct should be followed closely for neurologic signs, patients with consciousness impairment should be assessed with a neurosurgical team for surgical intervention in a timely fashion. The surgical treatment indications in ischemic stroke are quite limited. Temporary external ventricular drainage or permanent shunt systems may be considered to prevent progressive neurologic worsening, we wished to point out that a timely surgical procedure in a cerebellar infarct case where acute hydrocephalus developed could be life saving.^{1,2,8,13-15}

There are no definitive methods to treat the former type at the present time, but, for the latter, decompressive surgery is effective. The major method of treatment of massive cerebellar infarction is suboccipital craniectomy and removal of the mass lesion to relieve the acute brain-stem compression.

However, it is obvious that ventricle drainage and shunting is the treatment of choice in some cases. Massive cerebellar infarction was found in 15 of 1700 consecutive cases of acute cerebrovascular diseases, indicating that massive infarction of the cerebellar hemisphere is really a rare occurrence; the cases requiring surgical intervention are even fewer. Surgical treatment yielded significant recovery in the patients with severe neurological deficits. Prompt diagnosis of cerebellar infarction is required to ensure adequate therapy.^{1,2,13-15}

CONCLUSION

Cerebellar infarcts may cause death as a result of pressure increase in the posterior fossa and pressure on the brain stem due to edema. The surgical treatment indications in ischemic stroke are quite limited. Temporary external ventricular drainage or permanent shunt systems and surgical decompression of the posterior fossa may be

considered to prevent progressive neurologic worsening. Prompt diagnosis of cerebellar infarction is required to ensure adequate therapy. In conclusion, we wished to point out that a timely surgical procedure in a cerebellar infarct case where acute hydrocephalus developed could be life saving.

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