Spontaneous spinal subarachnoid hematoma discovered accidentally

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Received March 2, 2018

Revised March 27, 2018

Accepted April 12, 2018

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Acute spontaneous spinal subarachnoid hematoma with unknown origin, is bleeding into the subarachnoid space of the spinal cord, and it can occur in various ages but it occurs mainly in middle and old ages. It is a rare disease reported with one per million in the world every year. We experienced a 68-year-old female patient of spontaneous spinal subarachnoid hematoma with unknown origin that the patient admitted to emergency medical center due to non-particular symptoms and the disease was accidentally discovered after various tests and examinations, and then the emergency surgery was conducted.

Keywords: Hematoma; Subarachnoid; Spinal; Emergencies

INTRODUCTION

Acute spontaneous spinal subarachnoid hematoma with unknown origin, is bleeding into the subarachnoid space of the spinal cord, and occurs usually in middle and old ages. Most of cases occur in thoracolumbar and cervicothoracic areas. It is a rare disease reported with one per million in the world every year [1-3]. For clinical finding, there are sudden severe radiating pain, and compression on neural muscle and spinal code occurring quickly, accompanying neurological abnormal findings in various levels [4]. The diagnosis is made by magnetic resonance imaging (MRI). For the treatment, if the symptom is better, conservative therapy is prioritized but if neurological deficit is severe, it requires an emergency

surgery. For its prognosis, accuracy of the diagnosis, and temporal interval between occurrence of symptoms and surgery are critical [5-7]. We experienced a case of spontaneous spinal subarachnoid hematoma with unknown origin that the patient admitted to emergency center due to non-particular symptoms and the disease was accidentally discovered after various tests and examinations, and then the emergency surgery was conducted.

CASE

A 68-year-old female patient came to hospital because of discomfort in the solar plexus and pain radiating to the left scapula occurring suddenly three hours prior to admission.

She is a housewife, and is prescribed and takes aspirin due to hypertension and cerebral infarction.

When she admitted to hospital, vital signs were blood pressure 180/90 mmHg, pulse 80 per minute, respiration 20 per minute, and body temperature 36.5°C, respectively. Blood test was done, and in complete blood cell count test, white blood cell 5,120/mm³, hemoglobin 13.7 g/dL, hematocrit 40.5%, and platelet 213,000/mm³ were measured. In biochemical test, Na⁺ 144 mEq/L, K⁺ 4.0 mEq/L, Cl⁻ 102 mEq/L, serum glucose 124.3 mg/L, albumin 4.53 mg/L, total bilirubin 0.68 mg/L, amylase 19.0 U/L, blood urea nitrogen/creatinine 23.8/0.77 mg/L, aspartate aminotransferase/alanine aminotransferase 36.0/12.3 U/L, creatine kinase (CK) 251.0 U/L, CK-muscle brain/hs Troponin-T 6.600/0.009 ng/mL were measured. In blood coagulation test, prothrombin time 10.5 seconds, international normalized ratio 0.95, and activated partial thromboplastin time 30.5 seconds were measured. For arterial blood test, pH 7.477, pCO₂ 28.9 mmHg, base excess -2.2 mmol/L, and pO₂ 98.6 mmHg were measured. For neurological test, there was no abnormality in cranial nerve test, and there was no tenderness around the spine.

In order to identify acute myocardial infarction, electrocardiography and cardiac enzyme test was measured, and echocardiography conducted in emergency center did show no particular findings, as well. In order to identify disease such as aortic dissection and aortic aneurism, aortic computed tomography (CT) was conducted but there were no particular findings.

The patient, after her admission, complained continuous chest discomfort, and her symptoms were monitored after injecting nitroglycerin but the symptoms were not improved. Three hours after her admission, the patient complained suddenly involuntary motion of both hands without pain, and newly conducted neurological physical examination showed lower senses of apperception, location, vibration, and temperature in dermatome including nipples. In additional interview about medical history, when she admitted to hospital at first, it was found that pains in solar plexus and back were chief complaints and both lower limbs also showed muscle weakness. And in the conducted physical examination, upper limb G5, both knee elevation motor G3, ankle & toe dorsiflexion motor G2 were shown. For Babinski reflex, both sides showed positive reactions, and anal tone showed decreased reaction. There was adnominal distention. After inserting catheter, more than 1,000 mL was drained.

Then, the whole body spinal MRI was conducted, and spinal subarachnoid hematoma showing high signal intensities, compressing spinal cord from the fifth cervical vertebra to the third thoracic vertebra, was found.

In the MRI conducted in MRI 3 hours and 3 minutes after her admission, the lesion of C6-T6 spinal subarachnoid hematoma was confirmed, and it was diagnosed as acute spinal subarachnoid hematoma, showing spinal compression by hematoma, and muscle and sense weakness were found (Fig. 1), and then, the emergency surgery was planned and prepared. However, the patient's both lower limbs became improved

Fig. 1. Sagittal T1-weighted magnetic resonance imaging (MRI) views. (A) It shows a fusiform longitudinal dorsal epidural mass extending from C6 to T6. (B) Horizontal MRI views.

muscular strength from G3 to G4, and the finding of sense weakness under solar plexus also became improved, too. Therefore, after hospitalization and observation of the prognosis, it was decided to judge whether to have surgical treatment. But suddenly, left lower limb showed muscle weak with G0 and the emergency surgery was conducted. During the surgery, laminectomy and dural incision were applied, and epidural hematoma was observed. Irrigation, and removal of hematoma were made, and decom. T2, 3, and 4 were also conducted.

On the first day after the surgery, right lower limb recovered to muscle strength G5 and left one recovered to G4, respectively. On the second day after the surgery, muscle strength of left low limb also recovered to G5. The patient was discharged on the 20th day of her admission, and the 18th day after the surgery, getting better.

DISCUSSION

Acute spontaneous spinal subarachnoid hematoma with unknown origin, is bleeding into the subarachnoid space of the spinal cord, and it can occur in various ages but it occurs mainly in middle and old ages. It happens mainly in thoracolumbar and cervicothoracic areas as well as their junction parts. For clinical symptoms, it is proportional to space of spinal cord to spinal cavity. In sexual ratio, male:female is 2:1, and there are more male patients but the disease in cervical area occur more frequently in female, as reported [1,7-9].

Depending on location of hematoma, prognosis may vary, and thoracic area is narrower than cervical and lumbar areas, and if there is hematoma on it, it invades to spinal cord and cauda equina, and even small bleeding causes quickly neurological symptoms. Upper and lower areas of spinal cord contain many blood vessels as well as collateral circulation. Middle thoracic area (T4-T8) has very small collateral circulation, and is supplied by only one blood vessel, with higher risk of ischemia than other areas, and if there is a hematoma in this area, there is higher risk of spinal damage [4,10,11].

The mechanism of bleeding is not clear. Trauma, tumor in spinal cavity, deformed blood vessel and use of anticoagulant are said as causes but it is not clear. In addition, it is said that if pressure is up in chest or abdominal cavity suddenly, extradural vertebral venous plexus without valve are ruptured with expansion, causing hematoma. Therefore, spinal vertebra's

epidural artery is seen as cause of hematoma [3,11,12].

Symptoms vary depending on location of occurrence of hematoma or degrees of compression against spinal cord. Spontaneous spinal subarachnoid hematoma occurs usually in acute type but the others occur in sub-acute or chronic type, and for clinical status, there are radiating pain in upper limbs, acute pains in cervical or in solar plexus. If it occurs in thoracic area, acute severe pains, and sudden and dramatic compression of spinal cord and cauda equina may cause paraplegia. And quick nerve compression symptom, deficits of motor-sense function, and retention of urine may occur. If it occurs in lumbar area, with severe lumbar pain, quick radiating pain to lower limbs may happen, and depending on compression against spinal cord, motor ability and sense may be lost, and it may be more chronic than other areas [13,14].

Diseases to be distinguished with acute spinal subarachnoid hematoma include transverse myelitis, acute spinal disc hernia, epidural abscess, epidural neoplasm, and pathologic spine fracture. If there is no doubtful symptoms of a patient in emergency room (ER) center, it is to have MRI scan at first but in case of CT on chest and abdomen, it may be discovered accidentally. For the diagnosis, MRI T1 weighted image is most useful. Within 24 hours after the occurrence, T1 weight images show even signal intensities in spine and T2 weighted images show high signal intensities or uneven signal intensities. Twenty-four hours after the occurrence, T1 weighted image show high signal intensities, and T2 images show even signal intensities in cerebrospinal fluid [4,6].

For the treatment, in the initial stage, early application of decompression is recommended. If the symptoms is mild, or if the symptoms before reading the MRI results become surely better, the conservative therapy is prioritized. For a patient with dramatically deteriorating in clinical symptoms, immediate removal of hematoma, and emergency decompressive laminectomy are useful, and if the surgery is made within 30 hours, more than 50% can make a recovery available for walking. There are controversies on surgical treatment on local chronic spinal subarachnoid hematoma in lumbar area, and options of treatment can be different depending on level of nerve damage, time interval between occurrence of the symptoms to the diagnosis, and MRI finding [2,5].

If not treated, the disease in cervical area, accompanying symptoms such as pulmonary embolism, myocardial infarction, and respiratory insufficiency, may result in death, while

the disease in thoracic area, causes complete nerve paralysis, and the disease in lumbar area leaves symptom similar to sudden spinal disc hernia, and factors influencing neurological prognosis include accuracy of diagnosis, symptoms, temporal interval between occurrence and surgery, location of hematoma, degree of nerve damage before the surgery, and operation time [6,15,16].

For an emergency medicine specialist who observes frequently diseases influenced critically by quick and fast diagnosis for prognosis of the patient, a patient who admits to ER center with non-specific symptom is difficult to doubt the diagnosis in the early stage, causing the diagnosis very late. In this case, it was particular that, according to the patient's chief complain, the diagnosis was confused, causing to delay the diagnosis. And then the diagnosis, the patient showed improved muscular strength, and during the conservative treatment, sudden muscular strength deterioration occurred and the emergency surgery was conducted.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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