Cervical spine intradural-extramedullary hematoma presenting as ipsilateral hemiparesis

Chih Ming Lin

Department of Neurology, Cathay General Hospital, Hsinchu, Taiwan

Abstract

A 75-year-old Taiwanese man suffered from acute onset of right-sided extremity weakness while talking to his neighbors. He was transferred to the hospital within three-hour time after symptom onset. Initial acute ischemic cerebral infarct was diagnosed based on his symptom and cerebral computed tomography. Thrombolytic therapy was held after his symptom improved promptly and could not excluded other etiology. Thorough history taking unraveled previous Chinese medicine clinic visit because of neck sore. However, he received limited improvement after several times of massage treatment. Magnetic resonance imaging (MRI) of the cervical spine demonstrated hematoma compressing right side intradural-extramedullary space at the C2/C3 level. Through his clinical course, muscle weakness was the sole neurological finding with sparing of sensory defects. Given the close anatomy relationship between sensory and motor lamina distribution in the cervical spinal cord, our patient presented a rare manifestation. Cases of cervical spine intradural-extramedullary hematoma are not often seen and only sporadic in the documented literature. We wish, through the report of this article, to inform the first-line physicians with the following information. Among the elderly, neck sore is a common symptom. Over-stretching or overt local massage is not suggested due to relatively fragile musculature. In the clinical diagnosis and localization of lesion, cerebral or cervical spine lesion could mimic with each other and manifest hemiparesis as their first symptom. Meticulous history taking, neurological/physical examination and pertinent laboratory work-up should be done before initiation of intravenous thrombolytic therapy as it could cause catastrophic consequences if not used properly.

Introduction

Intradural-extramedullary cervical spine hematoma (IECSH) is seldom seen in the relevant literature. It could lead to cervical myelopathy, which compressed by the occult

hematoma. The neck sore/pain, or radiating discomfort are among the common presentation and usually characterized with subsequent motor, sensory, autonomic (urinal/fecal) dysfunction.^{1,2} Manifestation with sole hemiparesis is rare and should be cautious in the process of pathologic localization. We herein described a case developing abrupt onset of right-sided extremity weakness. Its clinical picture, path-physiology, and treatment were discussed.

Case Report

A 75-year-old Taiwanese man developed abrupt onset of right-sided extremity weakness while talking to his neighbors. He had no major past medical history including hypertension, diabetes mellitus or other chronic disease. He demonstrated no facial asymmetry, slurred speech, numbness, headache, dizziness or double vision. He collapsed on the ground and unable to walk by himself. He could not use his arm to hold himself and he felt a sense of heaviness over right side thigh region. His son and neighbors called the ambulance and he was therefore sent to our emergency room for treatment. In the emergency room, his neighbors confirmed his right side limbs became flaccid and he had trouble using his right side extremity against gravity. Doctor arranged non-contrasted cerebral computed tomography and showed no definite lesion. Due to the fact he was transferred to the hospital within three-hour time after symptom onset and on suspicion of acute cerebral infarction, medical staff of emergency medicine department intended to administer intravenous recombinant tissue plasminogen activator (r-tPA). (Initial routine biochemistry check-up, 12-lead ECG, and chest roentgenogram were all normal) Neurologist was consulted but found his right side motor function moderately improved (Arrival muscle power, Medical Research Council: Right/Left=1/5; 45 minutes after arrival, Medical Research Council: Right/Left=3/5). Thrombolytic therapy was therefore suspended because of drastic amelioration of neurologic symptom. During admission, we performed thorough neurological examination.

Mentality was fair and oriented to time, space and person. Cranial nerve and cerebellar testing were normal. No sensory deficits including sensory level were apparent. Muscle power decreased over right side extremities suggestive of hemiparesis. Increase right side deep tendon reflexes along with bilateral positive Babinski sign were detected. (Knee and ankle jerks were particularly exaggerated). Hoffman and Tromer signs were present upon right side finger flapping. Jaw jerk was absent.

Correspondence: Chih Ming Lin, Department of Neurology, Cathay General Hospital, Hsinchu, Taiwan.

E-mail: googlejoseph@yahoo.com.tw, josephsimion@yahoo.com.tw

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Findings from cephalic computed tomography and magnetic resonance imaging (MRI) were done three days after admission and did not show acute ischemic lesion. Nerve conduction velocity, F-wave and evoked potential examinations were all within normal limits. Detailed history was probed and our patient stated two weeks prior to admission he ever visited Chinese medicine clinic on account of occasional neck sore. He received several bouts of neck massage but effect was limited. Cervical magnetic resonance imaging was arranged five days after admission and revealed a mass postero-laterally compressing C2/C3 level of cervical spinal cord (Figures 1, 2). We referred him to the neurosurgical team as soon as the imaging study was available and our patient agreed to accept the surgery. The surgery went successfully and delineated a hematoma lying dorsally on the cervical spine cord (Figure 3). Our patient regained his muscle power with MRC, Medical Research Council: Right / Left= 4- 4+ /5) two months after operation. He continued to have regular out-patient-department follow-ups until September 2010.

Discussion

Intradural-extramedullary cervical spine hematoma (IECSH) could cause myelopathy. Its common initial presentations are neck pain, chest tightness and autonomic dysfunction.¹⁻³ Based on the anatomical predilection, spinal cord abscess, vascular malformation, bleeding derived from use of anticoagulant medication, tumor invasion are well-documented causes.^{2,3} Hematoma deposited in cervical area could be subcategorized into traumatic and non-traumatic types. Our patient did not take any anticoagulant medication or having any systemic diseases. Chiropractic

manipulation from Chinese medicine clinic visit prior to admission could provide a hint of possible external force jeopardy. Hence, in our case, traumatic type is most favored.

The cervical spine curvature and its adjacent musculature in the elderly are quite fragile and different from other age groups.² The elder people are inclined to suffer from degen-

Figure 1. Cervical spine magnetic resonance imaging, sagittal view: An 1×1.8×2 cm spindle-shaped intradural extramedullary hematoma on T2 weighted imaging with low signal intensity just lateroposterior to thecal sac at C2/3 level (White arrow).

Figure 2. Cervical spine magnetic resonance imaging, axial view: Marked posterior indentation of cervical cord by the hematoma noted on right side (black arrow).

Figure 3. Operation findings: a hematoma tinged on the dorsal aspect of the cervical spinal cord (black arrow).

erative osteolytic change both in cervical and lumbar regions.³ Cervical spine spur formation or non-blunted structure could not only cause symptoms similar to myelopathy but also induce obstruction of venous return from venules in vicinity.⁴⁻⁷ This can lead to either extraversion or ischemic change of the blood vessels. It is still debated whether the aforementioned could serve a pathologic model for our patient.^{6,8} But the time pattern between the onset of symptom (hemiparesis) and operation/pathologic findings could provoke the possible correlation. It is suggested head and neck chiropractic manipulation is not advised or should practice under great caution and protection.

In reviewing our patient's history, he presented to emergency room with acute onset of right-sided extremity weakness. Vascular lesion of left side, either cerebral or brainstem lesion, is naturally considered to be the first item on the differential diagnosis list.^{9,10} Unfortunately brain imaging studies proved otherwise. Detailed history is of upmost importance in terms of neurologic localization since symptoms such as neck pain/ sore, unexplained constant head and shoulder sprain, and habitual neck manipulation could be so vague that even first line physician easily overlooked. Normal spinal laminae of cortico-spinal tract cross over at the level of olive in medulla oblongata. A lesion that influence right cortico-spinal tract could be responsible right side hemiparesis as shown in our patient.^{4,9,10} Hence cervical spine lesion should be kept in mind when encountered with patients afflicted with hemiparesis despite its rarity.^{10,11} One unique and unusual presentation in our patient is the sole motor symptom manifestation with sparing of subjective sensory complaint and objective neurological findings. Pain and touch sensation are governed by spinothalamic tract. A mass compression could easily invoke both spinothalamic tract and corticospinal response due to close proximity of cervical spinal cord. (Spino-thalamic tract lay medial-posteriorly in the cervical spine cord whereas corticospinal tract latero-posteriorly). The anatomic discrepancy between our patient and others could stipulate a possible hypothesis but underlying explanation is still unclear and requires intense investigation.^{1,4,9,11}

In the issue of thrombolytic therapy, intravenous recombinant tissue plasminogen activator (r-tPA) remains the gold standard and the most effective drug of choice in treating ischemic stroke. Before administration, the stroke team should be activated and meticulous screening is crucial to prevent catastrophic consequences. Inclusion and exclusion criteria should be matched based on stroke patients' condition and informed consent is required.¹² Previous history of hematoma or bleeding tendency, shifted neurologic symptom

and rapid improvement of neurologic deficits are factors that contradicted to use of r-tPA. Our patient's hemiparesis improved quickly in the emergency room and he is not sure whether he has bleeding tendency. Imminent cessation of r-tPA saved his life.

Conclusions

i. Chiropractic maneuvering should not be suggested in the elderly when encountered with head and neck problem.

ii. Hemiparesis could sometimes be confusing in the process of localizing the lesion. We propose it should be listed as possible differential diagnosis in face of cervical myelopathy.

iii. Up to date, r-tPA is the most potent and effective drug of choice in stroke treatment inventory. Meticulously screening potential candidate before administration is the rule of thumb to prevent avoidable hemorrhagic catastrophe.

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