

Acute cerebral MCA ischemia with secondary severe head injury and acute intracerebral and subdural haematoma. Case report

D. Balasa¹, A. Tunas¹, I. Rusu¹, A. Hancu², G. Butoi³,
V. Gramanschi⁴

¹Neurosurgery, "Sfantul Andrei" Hospital, Constanta, Romania

²Neurology, "Sfantul Andrei" Hospital, Constanta, Romania

³Medimar Clinic, Constanta, Romania

⁴Resuscitation Department, "Sfantul Andrei" Hospital, Constanta, Romania

Abstract: Generally, according to international literature, cerebral ischemia is a secondary posttraumatic lesion produced by direct compression in the context of a cerebral herniation syndrome or indirect by vasospasm produced by posttraumatic subarachnoid, subdural or intraventricular hemorrhages. We present the case of a patient with an acute MCA ischemia with severe head injury due to a fall with subsequent intracranial acute intracerebral and subdural hematoma which evolved with acute left uncal, parahippocampal and subfalcinecerebral herniation (coma, GCS 6, left mydriasis, right severe hemiparesis). Surgical emergency aspiration of the hematomas was performed. Postoperative treatment of cerebral ischemia and residual hematomas was properly done. We consider important and underdiagnosed the association of cerebral ischemia and secondary posttraumatic brain injuries. *Abbreviations:* MCA-middle cerebral artery, GCS- Glasgow Coma Scale, ICA-internal carotid artery, PCA-posterior cerebral artery, ACA-anterior cerebral artery. *Conclusion:* We present a case of a patient with an acute MCA ischemia with secondary head injury due to a fall with subsequent intracranial acute intracerebral and subdural hematomas. Surgical emergency aspiration of the hematomas was performed. The treatment was performed for both lesions (cerebral ischemia and posttraumatic hematomas) with vitamins B, neurotrophycs, pain killers, antibiotics. Unfortunately, due to aggravation of the Mendelson syndrome, the patient died 7 days later.

Key words: cerebral ischemia, secondary head injury, acute intracerebralsubdural hematoma.

Introduction

Generally, according to the international literature, cerebral ischemia is a secondary posttraumatic lesion produced by direct compression in a cerebral herniation syndrome, by perfusion failure in cerebral micro or macro circulation, by increased ICP due to swelling or expanding hemorrhagic mass (2), and or indirect by vasospasm produced by posttraumatic subarachnoid, subdural and intraventricular hemorrhages. We present the case of a patient with an acute MCA ischemia with cranial trauma due to a fall with subsequent intracranial acute intracerebral and subdural hematomas who evolved with acute left uncal, parahipocampal and subfalcine herniation.

Case report

A 66 year old female was admitted as an emergency after a fall with secondary head injury, followed by rapid deterioration of neurologic status (drowsiness-stupor-coma), vomiting, right severe hemiparesis. Within a few hours, GCS reached 6 points, with left eye mydriasis. The patient has 3 vomiting episodes which lead to suspicion of incidental aspiration of vomitus. Emergency CT Scan revealed an acute intracerebral fronto-temporo-parietal hyperdense hemorrhagic lesion (1) and acute fronto-parietal subdural haematoma on a large perilesional hypodense lesion with aspect of an acute ischemia in left MCA territory, left uncal, parahipocampal and subfalcine herniation (1)

Emergency surgery was performed (fronto-parietal craniectomy, aspiration of intracerebral and subdural hematomas).

After a 36 hours of neurological

improvement (the patient recovered from superficial coma and became obnubilated - GCS11, recovery of the motor function on the right side, moderate hemiparesis), the patient deteriorated (GCS 9, became hypertensive, with right hemiplegia). New emergency CT Scan revealed acute partial ischemia on MCA left territory and a small amount of intracerebral hematoma, significantly smaller than the preoperative scan, and a small acute subdural residual hematoma.



Figure 1 | Figure 2

Preoperative CT scan: Acute left fronto-temporo-parietal intracerebral haematoma and left acute subdural frontal hematomas (black double peak arrows). Left uncal and parahipocampal herniation (black arrow). Large hypodense lesion with aspect of stroke within the left MCA territory around intracerebral hematoma (white arrow)

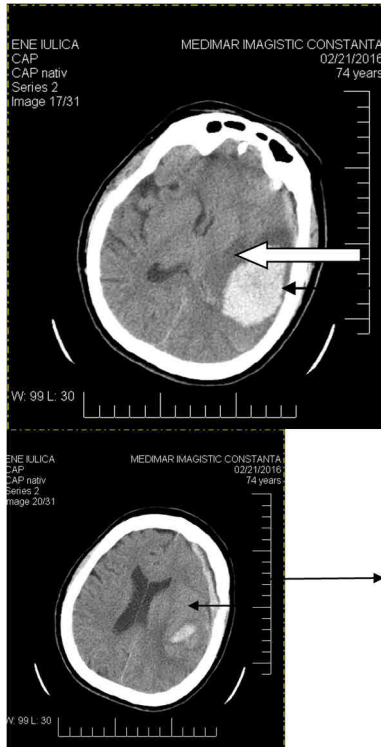


Figure 3 | Figure 4

Preoperative CT Scan: Acute left fronto-temporo-parietal intracerebral hematoma and acute left subdural frontal haematomas (black double peak arrows). Large hypodense lesion with aspect of a stroke in the left MCA territory (white arrow). Left subfalcine herniation (black arrow)

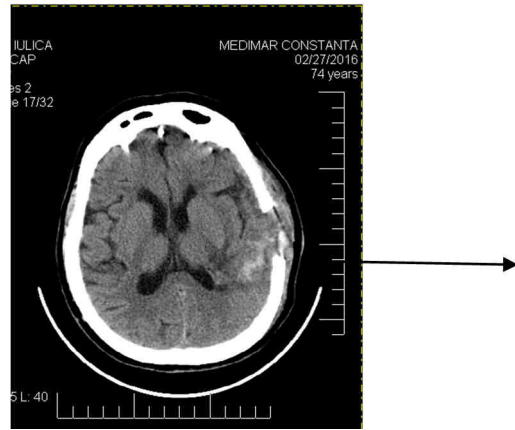
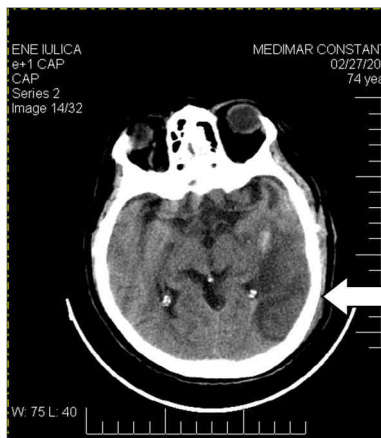


Figure 5 | Figure 6

Postoperative CT Scan: Large hypodense lesion with aspect of stroke in left MCA area (white arrow). Small amount of intracerebral hematoma (black double peak arrow)

The patient was treated simultaneously for both lesions (MCA ischemia and residual posttraumatic intracranial hematomas) with neurotrophic, aspirin, Vitamin B, antibiotics. Despite the correct treatment the patient dies 3 days later due to aggravation of Mendelson syndrome.

Discussion

Generally, according to international literature, cerebral ischemia is a secondary posttraumatic lesion produced by direct compression in a cerebral herniation syndrome, by perfusion failure in cerebral micro or macro circulation, by increased ICP due to swelling or expanding hemorrhagic mass(2) and or indirect by vasospasm produced by posttraumatic subarachnoid, subdural and intraventricular hemorrhages.

We have not found a similar case in medical literature. The patients with stroke has

a relative high risk of falling (6). After Ugur et al (6) the patients between 55-69 years have the highest risk of falling.

We believe that the association between cerebral ischemia and severe troubles of equilibrium with a secondary cerebral trauma, intracranial hematomas is underdiagnosed. But, for clinical and radiological reasons this coexistence can be proved with great difficulty:

- Clinical reasons: the patients are admitted in the hospital with deterioration of consciousness, HIC syndrome, cerebral herniation syndromes produced by the coexistence of intracranial posttraumatic lesions and cerebral ischemia. For these reasons anamnesis is not always clear to argue the 2 cerebral entities (cerebral ischemias and intracranial hematomas) and precise succession.

- Radiological reasons: is well known that CT is the golden standard for head injuries (1, 4). But the images of cerebral ischemia may be invisible or indirect in the first 24 hours on CT, or may be masked by the presence of the traumatic intracranial lesions: intracerebral hematoma, subdural, extradural hematoma.

Head trauma after stroke generally have small consequences, skin abrasions, ecchymosis(6). We present the case of a 66 year old lady which was admitted as an emergency, after a fall, with secondary cranial impact. The patient described HIC syndrome (frequently vomiting), signs of left uncal, parahipocampal and subfalcine herniation syndromes (severe hemiparesis, left eye mydriasis, coma GCS 6 points). Emergency head CT Scan revealed an acute intracerebral fronto-parietal lesion and acute fronto-parietal subdural hematoma

surrounded by a large perilesional hypodense lesion with the aspect of an acute stroke within the left MCA territory, left uncal, parahipocampal and subfalcine herniation(1,5). Based on anamnesis and preoperative CT Scan we performed emergency surgery of the hematomas and had the presumption of coexistent MCA ischemia as a first cerebral lesion.

- * We made the differential diagnosis with a cerebral ischemia with hemorrhagic modification based on the anamnesis (fall and secondary head injury) and the presence on cranial CT of the acute subdural hematoma.

It was not possible for us to obtain a preoperative emergency MRI because of the neurological status of the patient (coma GCS 6, acute lateral supratentorial herniation syndromes - left mydriasis, right hemiparesis).

The second postoperative CT Scan, performed 3 days later, revealed the left MCA ischemia, in a very clear manner, with a small amount of residual intracerebral and subdural hematoma. Despite of the intensive treatment patient died 3 days later due to aggravation of Mendelson syndrome.

We advise as a routine an emergency MRI investigation in all patients which:

- Have a cranial trauma due to severe troubles of equilibrium followed by secondary fall, if anamnesis is clear;

- Have a Cranial CT Scan that shows posttraumatic cerebral lesions (intracerebral hematomas, contusion, subdural or extradural hematoma, associated with a significant perilesional hypo density),

If the neurological status of the patient allows.

The importance of a correct and early radiological diagnosis has a clear impact on the treatment and following investigations:

- We may add Aspirin within the classic treatment of the operated hematomas (neurotrophic, B Vitamins, occasionally antiepileptic medication, pain killers, antibiotics)

- We will investigate the etiology of cerebral ischemia and treat it accordingly.

Correspondence

Daniel Balasa

Bulevardul 1 Mai, 50 Bis, Bloc I2, Apartament 19, Constanta

Phone: 004 0744682613

E-mail: daniel_balasa@hotmail.com

References

1. Albanèse J, Portier F, Léone M. Tomodensitométrie du traumatismecrânien. In: SFAR, Eds: Conférences d'actualisation, Paris, Elsevier, 2000, 367 – 387
2. Blumbergs P. C. Neuropathology of traumatic brain injury in Neurosurgical Neurosurgery Youmans, sixth edition, 3288-3300
3. Chesnut RM, Marshall LF, Klauber MR. The role of secondary brain injury in determining outcome from severe head injury. *J Trauma* 1993; 34: 216-222.
4. Jacobs B, Beems T, Van der Vliet TM, Diaz-Arrastia R, Borm GF, Vos PE. Computed Tomography and Outcome in Moderate and Severe Traumatic Brain Injury: Hematoma Volume and Midline Shift Revisited. *Journal of Neurotrauma* 2011; 28: 203 – 215.
5. Narayan RK, Mass IR, Servadei F, Skolnick BE, Tillinger MN, Marshall LF et al. Progression of traumatic intracerebral hemorrhage: A prospective observational study. *Journal of Neurotrauma* 2008; 25: 629-639
6. Ugur C., Gücüyener D., Uzuner N., Özkan S., Özdemir G., Characteristics of falling in patients with stroke, *J Neurol Neurosurg Psychiatry* 2000;69:649–651