Non-traumatic spontaneous acute epidural hematoma - case report

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Abstract: The non-traumatic acute epidural/extradural hematoma is an entity rarely described in the literature. In general, it characterizes the young age, especially due to the relation of the dura mater with the internal side of the skull. In this article the authors present a case of pathological extradural hematoma, following a disseminated intravascular coagulation that appeared to a young woman suffering from a pregnancy that was stopped in progression. The necroptic findings corroborated with the microscopic diagnosis has revealed the presence of a non-traumatic acute extradural hematoma.

Key words: epidural hematoma, maternal death, disseminated intravascular coagulation

The epidural hematoma represents a blood collection placed between the calvaria and the dura mater having a compressive effect on the brain. It usually ensues from the striking at a variable speed of the head, that determines the detrusion and the shredding of the blood vessels which bleed in the space between the dura mater and the skull [1, 4]. Consequently, the extradural hematoma is predominantly traumatic [6] in over 95% of the cases [1].

Epidural hematoma appears predominantly to young people in which case the adherence of the dura mater to the skull is generally reduced. In terms of location, it frequently occurs unilaterally. The bilateral extradural hematoma is much less common and it represents about 2% out of the total of intracranial hematomas [7].

Although, as showed above, extradural hematoma is of traumatic etiology in most of the cases, non-traumatic hematoma has been described in the literature as rare entity [6, 10].

In terms of etiology of the pathological extradural hematoma, the infectious diseases have been the ones that have been more frequently incriminated. Frontal sinusitis, maxillary sinusitis [8] and otitis media have been mentioned as starting points in most cases.

Other causal factors involved: coagulopathies [9], vascular malformations of dura mater (that might be detected by cerebral angiography examination) or concomitantly with highly vascularized tumors, systemic lupus erythematosus, open-heart surgical operations, and hemodialysis [5].

Two mechanisms have been incriminated as being responsible for the appearance of the non-traumatic epidural hematoma:
- accumulation of exudate, pus or air which determines in time the separation of the dura mater from the internal side of the braincase,
- blood vessel inflammations which determine modifications of their walls [10].

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The acute and suracute extradural hematoma present in the homogenous mass of hyperdensity of the acute lesion, insular areas of hypo and isodensity whose significance seems to be given by the presence of active bleeding in the hematoma layer or in coagulopathy [2, 3].

Case report
The authors present the case of a 28 year-old young woman having a 16-week pregnancy, spontaneously stopped in progression, who died as a result of a non-traumatic acute extradural hematoma.

The medical documentation shows that the woman was admitted in the hospital with the diagnosis: "16-week pregnancy stopped in progression". The clinical examination upon admission was normal. The laboratory exam showed: hemoglobin 9,1 g%; trombocytes 93000/mm³; leucocytes 8300/mm³; urine with rare leucocytes, frequent epithelial cells.

The echographic abdominal exam revealed: placenta positioned on the anterior wall of the uterus at the level of the internal orifice of the cervix; normal quantity of amniotic fluid, fetal heart beats (FHB) absent; long thin cervix with the external orifice closed. While in hospital, an antispastic treatment was administered. An attempt to induce the abortion by means of oxytocin perfusions was ineffective. Consequently, two days after admission, the decision to perform a uterine curettage under general anesthesia was taken. The curettage extracted fragments of the macerated fetus.

The anatomo-pathological examination made on the fetal fragments revealed: brownish teguments partially or entirely macerated on various anatomical parts. The colour of the teguments indicate intense dehydration. According to the anatomo-pathological description, fetal death occurred more than 72 hours prior to the curettage.

About one hour and a half after the curettage, the patient suffered a convulsive fit, then became lethargic, responding to verbal stimuli with difficulty. A vaginal hemorrhage was noted, the uterus became progressively hypotonic and the general condition deteriorated rapidly. A CT scan detected an extradural hematoma (35 mm thick by 88 mm wide) located in the right fronto-parietal region, with variable density and a horizontal blood level, with the structures of the median lines having a subfalciform displacement to the left.

A neurosurgical intervention evacuated the hematoma, without identifying any fracture line or any major bleeding source. The postoperative evolution was defined by a persistent grade IV coma and a tendency to respiratory collapse which finally led to cardiac arrest and death, that occurred 12 hours after the neurosurgical intervention.

Necroptic findings
The external examination discovered no traumatic injuries on the deceased’s body or head. The internal examination revealed on the right frontoparietal region, on the convexity of the cerebral hemisphere, in the extradural space a few blood clots slightly adherent to the dura mater and a reduced thin layer of liquid blood. No macroscopic pathological modifications on the dura mater have been identified. The lungs were violet pale in colour, with reduced crepitations and elasticity; The internal organs are of extremely pale colouration. In the uterine cavity (11/13/2,5 cm) several organized, crimson coloured, mamillated structures were observed.

Microscopic findings
The microscopic examination of the duramater and the adherent clots of blood revealed a collection of red blood cells, fibrin and leucocytes [fig. 1], without organizing features or fibroblast proliferation. The Perls Prussian blue stain does not revealed any haemosiderin deposition. These features were compatible with a recent hematoma. No tumor or vascular abnormalities of the dura mater were identified. Examination of the brain samples showed diffuse and moderate edema, marked vascular congestion associated with micro hemorrhages in the Robin-Virchow spaces, and acute ischemic neuronal injuries. Some intra cerebral small vessels contained recent fibrinoleucocytic thrombi.
The lungs showed a microscopic aspect of diffuse alveolar damage, intraalveolar edema, fibrin, and variable inflammatory infiltrate [fig. 2]. No hyaline membranes were visible. Some arterioles contained fibrin thrombi.

No placental or fetal debris have been identified in the samples of uterus.

The others organs (heart, pancreas, liver, kidneys) do not show microscopic abnormalities.

**Discussion**

Disseminated intra-vascular coagulation (DIC) of obstetric etiology is a severe clinical condition with an evolution mainly dominated by hemorrhagic diathesis [7, 9].

A great number of obstetric conditions may be associated with the DIC. Among these, the intrauterine death of fetus is often responsible for the initiation of severe disseminated intravascular coagulation. During the retention of the dead fetus, the onset and the evolution of the DIC are slow, during a variable period of several days, just like in the case described above. The clinical features of DIC in this case are the result of a combination of symptoms resulted from the microvascular thrombosis and from the hemorrhagic diathesis [7].

The hemorrhagic syndrome is generally severe and generalized (bleeding from the genital passage, as well as extended bleeding from the vein puncture sites) and the partially disseminated thromboses are marked by brain ischemic areas. These ischemic areas are responsible for the deterioration of the state of consciousness, with confusional syndrome, convulsions, and subsequently coma.
As the macroscopic aspect of the structures from the uterine cavity alludes to the persistence of placental fragments but the microscopic examination of the uterus samples did not reveal the presence of the chorionic vilosities, which is the essential element to establish the diagnosis of “placenta”. In such circumstances it becomes clear that the structures observed in the uterine cavity were the consequence of local reparatory phenomena and consequently it can be concluded that the placenta was entirely extracted during the curettage. According to the medico-legal literature the severe disseminated intravascular coagulation can be complicated by various forms of intracerebral hemorrhage, among which the extradural hematoma.

**Conclusions**

Although the extradural hematoma is preponderantly of traumatic etiology, the medico-legal literature quotes several cases of pathological extradural hematomas, as being rare entities.

This case is considered to be of clinical and medico-legal importance because it underlines the possibility that during the evolution of a disseminated intravascular coagulation of obstetric etiology an epidural hemorrhage can occur, and even lead to death. Although this is a rare causality, it can occur and it must be considered as a possible cause of unfavourable evolution in a patient suffering from certain conditions that might lead to disseminated intravascular coagulation.

**References**