

Severe Head Trauma in a 39-Week Pregnant Woman with Amenorrhea (SA) Apropos of a Case at CHU Ignace Deen in Conakry

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Abstract

Objective: Was to present the management of a pregnant woman at 39 SA received for severe head trauma in the emergency room. Severe trauma in pregnant women can have serious maternal and especially fetal consequences in the absence of a diagnostic and therapeutic strategy. We report the case of serious trauma in a 39 WA pregnant woman, nulliparous. Admitted to the emergency room for serious head trauma following a public road accident. The clinical picture was dominated by impaired consciousness with a Glasgow score of 8/15, right otorrhagia, desaturation at 89% AA and respiratory rate at 36 cycles/min. The obstetrical examination noted a fundal height of 32 cm, a fetal heart sound (BCF) of 167 beats/min, a cephalic presentation, a cervical opening of 3 cm and uterine contractures. Imaging examinations outside the hospital because not available. The abdominopelvic ultrasound shows a monofetal pregnancy without placental abruption. The cerebral scanner shows an edemato-haemorrhagic contusion intra parenchymatous frontotemporal left. Respiratory support and an indication for caesarean section allowed the extraction of a live male child, Apgar at one minute 10/10 to five minutes 10/10, weighing 3000 g without abnormality on clinical examination. The evolution was favorable after 27 days of resuscitation. **Conclusion:** The care of a severely traumatized pregnant woman relies above all on good multidisciplinary coordination, based on close collaboration between emergency physicians, anesthetists-resuscitators, obstetricians, pediatricians, neonatologists and biologists.

Keywords

Trauma, Emergencies, Pregnancy, Resuscitation

1. Introduction

Severe trauma is the leading cause of non-pregnancy-related death in pregnant women [1] [2]. Although they only concern less than 1% of all accident injuries, serious trauma in pregnant women can have serious maternal and especially fetal consequences in the absence of a diagnostic and therapeutic strategy. Despite both maternal and fetal consequences, and since the life of the fetus is directly linked to that of its mother, the mother will always have priority in all therapeutic decisions.

Traffic accidents are the most common etiology of trauma in pregnant women, whether they are passengers or drivers of a vehicle [3]. There is no difference in maternal or fetal mortality related to the correct use of the seat belt [4]. However, mortality can reach 33% for the mother and 47% for the fetus in the event of ejection from the vehicle [5]. The objective of our observation was to describe the management of a pregnant woman at 39 SA with severe head trauma admitted to the emergency room and secondarily admitted to intensive care.

2. Observation

It was a 27-year-old patient, nulliparous, with a history of appendectomy at the age of 18, who had been received at the surgical emergency services of the CHU Ignace Deen by non-medical transport for serious head trauma during pregnancy. With loss of consciousness following a road accident. In the emergency room, the interrogation of witnesses made it possible to note that the patient had been knocked down by a motorcycle that was traveling at high speed. The anthropometric parameters on admission were: 95 kg for 175 cm, i.e. a body mass index of 31 kg/m². TA = 85/50 mm Hg, pulse = 130 beats/min, Fr = 36 cycles/min, peripheral oxygen saturation = 89% in ambient air (AA) and temperature 37°C. After conditioning (laying a central venous line in the right jugular, bladder sounding). On neurological examination, there is a loss of consciousness with a Glasgow score of 8/15 (E3V2M3), nonmedicated pupils with good reactivity to light sensitivity, without focal signs and a right otorrhagia was present. Obstetrical examination notes a bulky abdomen, ovoid uterus with a long longitudinal axis and large upper extremity, uterine height 32 cm, fetal heart sounds (BCF) = 167 beats/min the vulva is ready for vaginal examination the cervix is open and dilated to 3 cm, a cephalic presentation was objectified, the promontory not affected. A cardiopulmonary examination revealed no abnormalities. On the injury report, there is a scratch on the face, and a contusion on the right shoulder) and no fractures.

The biological assessment carried out revealed Hb = 8 g/dl, Hte = 26.4%, Platelet = 165 G/L, Blood grouping = B+ and blood sugar = 1.08 g/l, blood ionogram, urea, serum creatinine and hemostasis assessment (prothrombin level, activated partial thromboplastin time) are normal. The imaging explorations (ultrasound and brain scan) were carried out outside the hospital because we do not have them in our hospital. Abdomino-pelvic ultrasound shows an evolving

monofetal pregnancy. After 39 weeks of amenorrhea, no placental abruption as for the cerebral computed tomography revealed an oedemato-haemorrhagic contusion intra parenchymal left frontotemporal and a solution of right parieto-occipital continuity (Figure 1 and Figure 2).

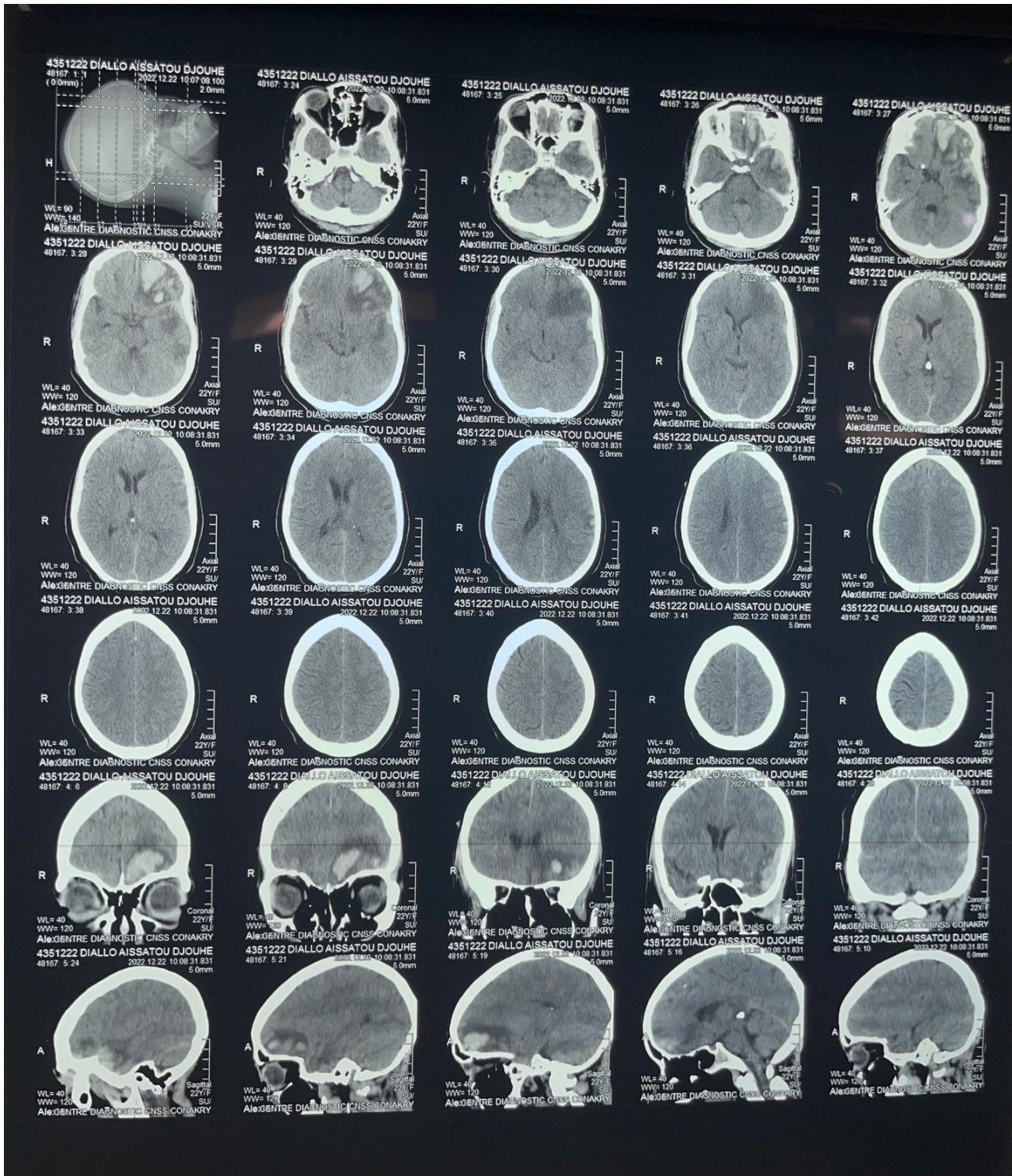


Figure 1. Cerebral computed tomography revealed a left frontotemporal intra-parenchymal edematous-hemorrhagic contusion.

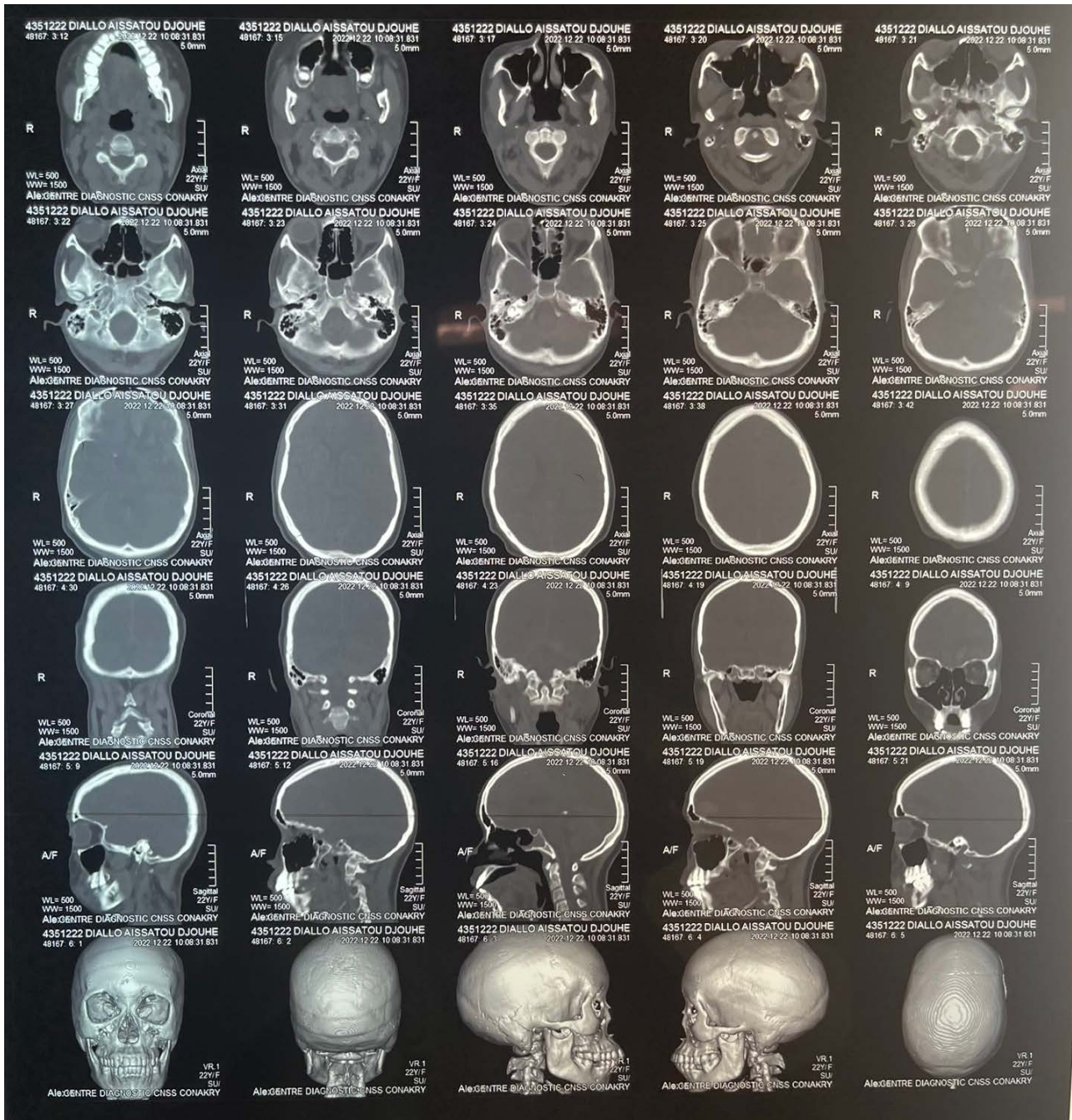


Figure 2. Cerebral computed tomography in the bone window revealed a right parieto-occipital solution of continuity.

The diagnosis of severe head trauma with evoked hemorrhagic edematous contusion. The patient was transferred to the intensive care unit for treatment. She underwent orotracheal intubation, artificial ventilation in controlled mode, placement of a central venous, non-invasive monitoring of blood pressure, heart rate, respiratory rate, peripheral oxygen saturation, monitoring of fetal heart rate and uterine contractions every 4 hours. ATH12 after stabilization and transfusion of two (02) blood bags B⁺ globular concentrate-iso group and iso rhesus, the decision to separate the mother-child under general anesthesia was made and

allowed the extraction of a living male child, Apgar at one minute 10/10 to five minutes 10/10 weighing 3000 g, height 53 cm, head circumference 33 cm, directed delivery of a complete placenta, and the patient was readmitted to intensive care for the postoperative course and therapeutic. The evolution under treatment was marked by the improvement of the conscience and the neurological state. On D6, the patient was successfully extubated and put on high-concentration mask oxygen therapy. With a Glasgow score of 13 (E4 V4 M5). On D14 the biological assessment noted Hb = 11 g/dl. On D15, a cerebral computed tomography scan shows a focal point of an intraparenchymal oedematous-hemorrhagic contusion in the process of resorption on the left frontotemporal (Figure 3).

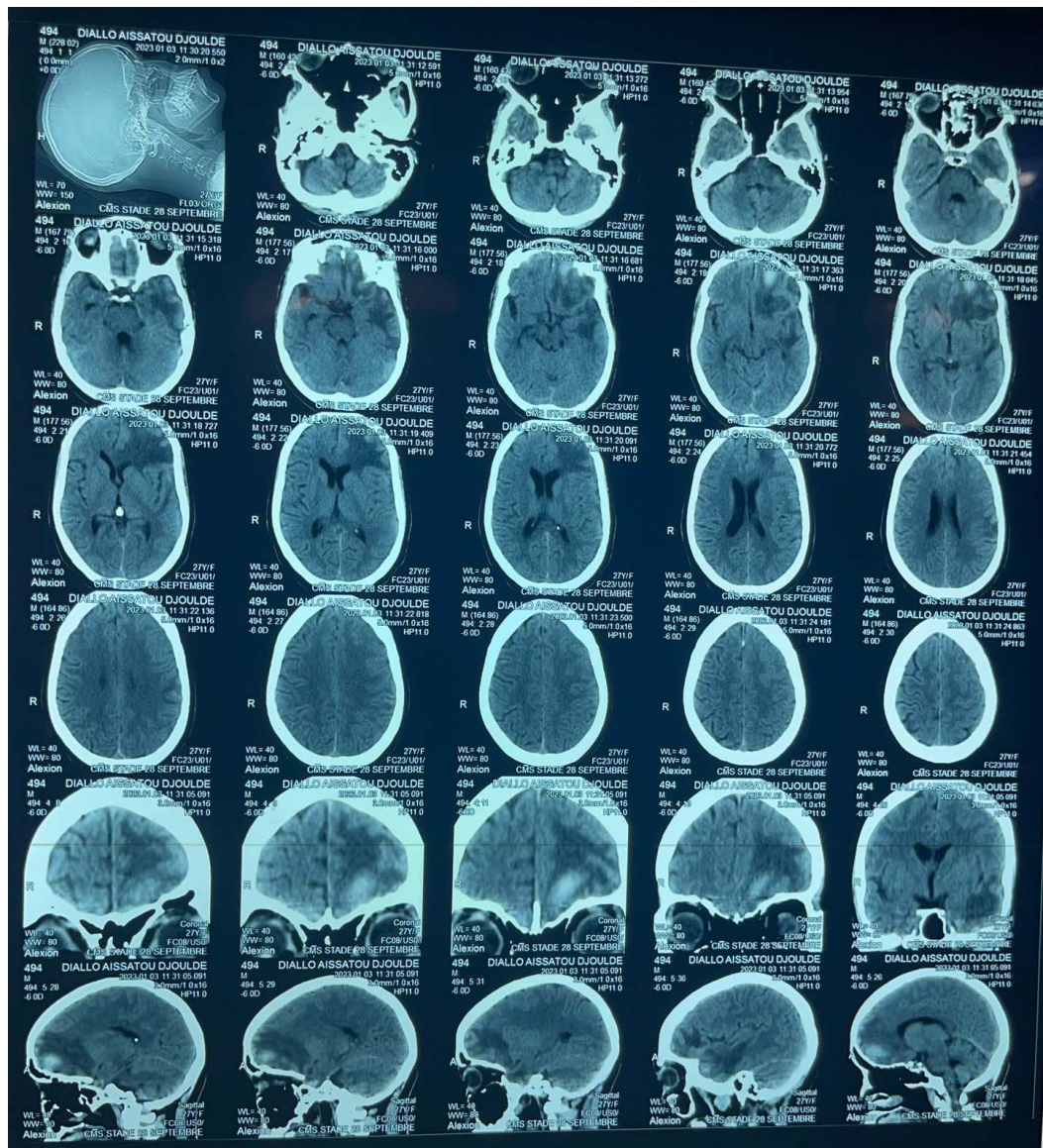


Figure 3. Cerebral computed tomography revealed a focal point of intraparenchymal oedematous-hemorrhagic contusion in the process of resorption on the left frontotemporal, responsible for a mass effect on the ipsilateral lateral ventricle.

On D20, the evolution was marked by an improvement in the clinical and neurological state, the Glasgow score went from 13/15 to 15/15 with normalization of the biological parameters justifying discharge authorization with home follow-up of the mother and child. On D27, the clinical state of the mother and her child was unremarkable. The examination of the patient and the child at six (06) months was unremarkable and the control of the cerebral computed tomography of the patient shows complete resorption of the hematoma (Figure 4). The child's examination to date was normal growth; the rest of the examination is unremarkable.

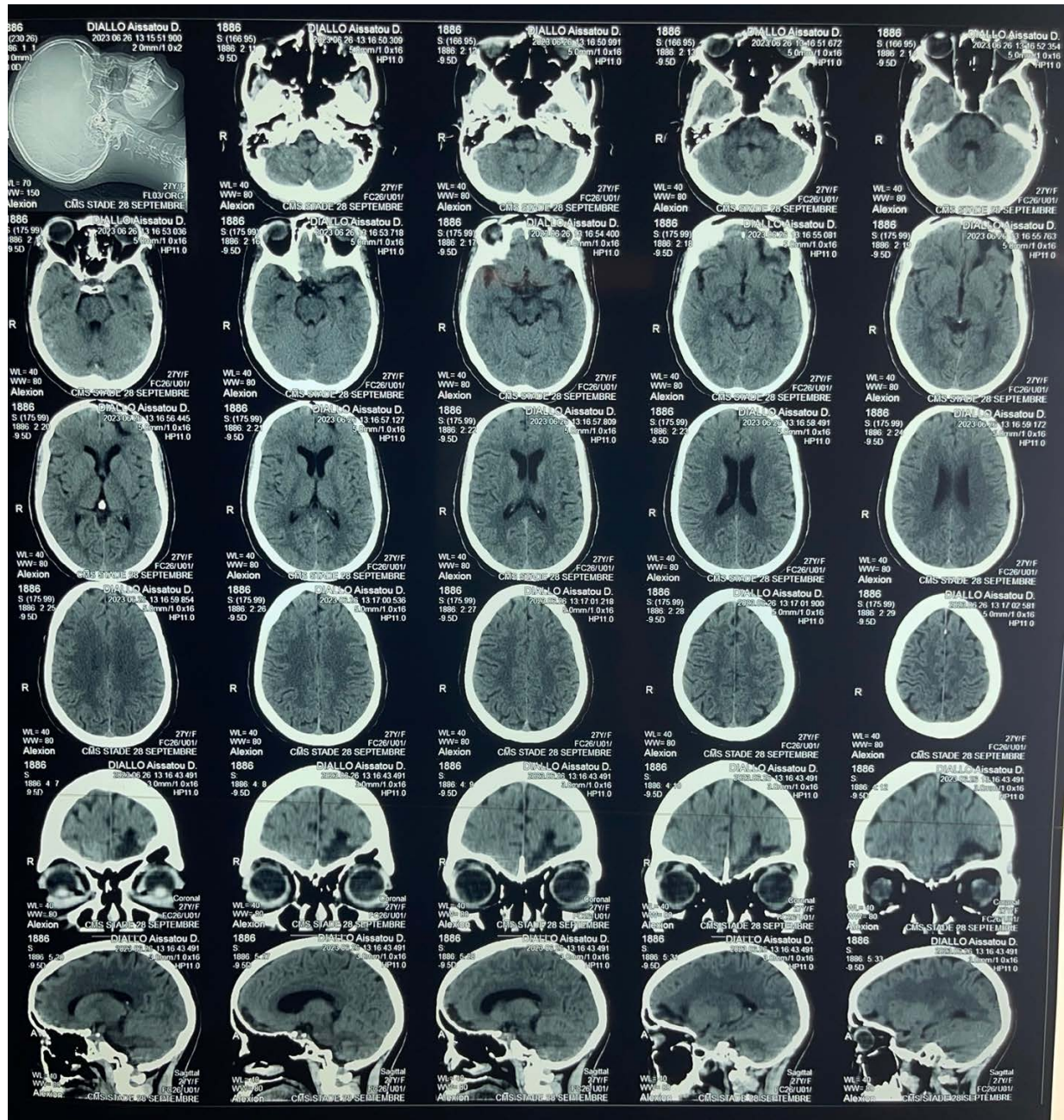


Figure 4. Six (06) control cerebral computed tomography of the patient shows complete resorption of the hematoma.

3. Discussion

Trauma in pregnant women is rare. It is estimated that 0.4% to 1% of French pregnant women are victims of trauma during their pregnancy [6]. Seventy percent of trauma occurs during the third trimester of pregnancy [7]. The gestational age at the time of the severe trauma is 26 to 29 weeks of amenorrhea (SA) [8]. They are accompanied by major morbidity with heavy sequelae on the emotional, family and social levels. According to published studies, delivery takes place between 37 and 39 SA (median value), with 6% of births within 24 hours of the trauma. Although in general the frequency of trauma is low, the maternal and fetal consequences can be significant, even for minor trauma. Maternal mortality can reach 10% of patients of all etiologies. Fetal death, directly dependent on the maternal condition, can rise to 60% in the last trimester of pregnancy in the event of severe trauma [9]. Public road accidents (AVP) are providers of high-kinetic trauma that can lead to serious maternal or fetal lesions. According to an American study [10], AVP causes serious complications that can go as far as maternal and more often fetal death.

In a series such as that of Weiss Hb *et al.*, AVP represents 82% of trauma leading to fetal death [11]. It is most often for the fetus fractures of the skull, limbs or spine [12]. Others [13] [14] had observed that even low kinetic AVP should not be neglected because they can lead to severe obstetric lesions such as placental abruptions. For our patient, the aggravation of the lesions could be due to the kinetics of the accident, mechanism and the gestational age which was 39 SA which represents a risk factor for maternal and fetal mortality. A study by E Raimond *et al.* [15] showed the consequences of trauma during pregnancy by comparing pregnant and non-pregnant women (Table 1).

Regarding the cause of trauma in pregnant women, the literature reports discordant results. This discrepancy is linked, on the one hand, to the travel habits of pregnant women and, on the other hand, to the country where the study was carried out. Indeed, in the study by Barre M *et al.*, the leading cause of trauma in pregnant women is falling [7]. Others [8] have concluded that 50% to 80% of falls occur in the third trimester of pregnancy. The risk increases from 32 SA due to changes in the center of gravity and abdominal volume that disturb the apprehension of the environment. Direct fetal trauma is possible during a forward fall with an abdominal impact, especially as the term is advanced. In a recent French study, falls are responsible for placental abruption in 5% of cases [8]. On the other hand, a study carried out by Oxford CM *et al.* [16] showed that road accidents are a frequent etiology. In our case, the AVP was the cause of the trauma (pedestrian motorcycle) traveling in the opposite direction of traffic.

A study by Bagou G *et al.* [9] shows that the consequences of the trauma for the mother can be linked to the intensity of the shock, and all the lesions usually encountered in a traumatized person are possible: hypovolemia, respiratory distress, cranial trauma severe, blunt or penetrating abdominal trauma. And are the main causes of maternal death during trauma. The physical examination of the

Table 1. Studies have compared traumatic lesions and mortality in pregnant and non-pregnant women (upper part), and the obstetric and perinatal outcomes of pregnancies with or without trauma (lower part).

Reference Country, year	Types of trauma	Trauma and pregnancy	Non-pregnancy trauma	Principle results
United States, 2015	AVP	324,535	14,719,533	For a comparable violent shock, the prevalence of moderate and severe trauma was similar in pregnant and non-pregnant women
Canada, 2015	AVP	5936	59,360	Mortality was reduced in pregnant women but the lesion severity score was lower in these women (probable recruitment bias due to pregnant women who consult mainly to be reassured)
United States, 2005	All	1195	76,127	In multivariate analysis after matching, mortality was significantly reduced in pregnant women (OR: 0.59; 95% CI: 0.38 - 0.89)
United States, 2011	All	3763	214,394	Mortality was twice as high in pregnant women, while the traumatic injury severity score was lower in these women.
United States, 2017	All	1148	43,608	The severity of the lesions was similar in pregnant and non-pregnant women. Mortality was similar in the two groups: 5.1 versus 4.1%; $p = 0.70$
United Kingdom, 2016	All	173	14,967	
Reference Country, year	Types of trauma	Trauma and pregnancy	Pregnancies without trauma	Principle results
United States, 2013	AVP	25,168	878,546	30% increase in preterm delivery, HRP and RPM after AVP. Risk of stillbirth multiplied by 3 in the absence of a seat belt
Australia, 2012	AVP	2147	604,380	Poor perinatal prognosis in women who gave birth during hospitalization for trauma.
United States, 2008	Falls	693	2079	Among women still pregnant after discharge, the prevalence of PRH remains higher than in the general population, including after minor trauma (ISS score < 9)
United States, 2004	All	10,316	4,833,286	The prevalence of a composite score (HRP or childbirth < 37 WA or birth weight < 2500 g) was lower in traumatized women: 9.4 versus 12.9%; $p = 0.04$
Israel, 2014	Minor trauma	51	1024	

Legend: _AVP: road accident; OR: odds ratio; C: confidence interval; RPM: premature rupture of membranes; HRP: retroplacental hematoma; ISS: injury severity score; SA: week of amenorrhoea.

abdomen can be complicated by abdominal distension related to uterine volume and makes the appreciation of a defense very difficult. This is the case with our observation of trauma on the pregnancy of 39 SA, in the event of rupture of a hollow organ, a clinical assessment may be difficult. However, apart from classic

lesions, Badaoui R *et al.* [17] have shown that a ruptured spleen is the most common intraperitoneal hemorrhagic lesion in closed abdominal trauma. In pregnant women, that it is probably linked to the venous hypertension of pregnancy and Splenic lesions are often associated with uterine lesions, both of which may cause acute hemoperitoneum. In our observation, the ultrasound performed did not show fetomaternal hemorrhage or placental abruption and in the intraoperative exploration of the abdominal cavity solid organs were normal.

For the fetus, threat of childbirth and prematurity (due to the need for early fetal extraction) are the first line of complications. In 11% of cases, delivery took place before 33 weeks [8]. In our observation, the obstetrical examination had noted a 3 cm opening of the cervix, therefore a risk of childbirth, which had led to prolonged continuous monitoring for several hours. In the study, Breysen L *et al.* [18] show that fetal mortality is also linked to the presence of a maternal complication: hemorrhagic shock, maternal death, etc., or to the occurrence of direct trauma by impact on the maternal pelvis or on the maternal spine [18].

Fetal skull fractures or fetal hemorrhages may then be encountered. Pejorative factors for the fetus are maternal tachycardia greater than 110/min, fetal heart rate less than 120/min, ejection of the mother from a vehicle, road accident involving a motorcyclist or pedestrian and placental abruption [19]. In our observation, the clinical examination at the birth of the child did not show any line of fracture. Fetal mortality is also linked to the presence of a maternal complication: hemorrhagic shock, maternal death, etc., or to the occurrence of direct trauma by impact on the maternal pelvis or on the maternal spine [10]. Fetal skull fractures or fetal hemorrhages may then be encountered. Pejorative factors for the fetus are maternal tachycardia greater than 110/min, fetal heart rate less than 120/min, ejection of the mother from a vehicle, road accident involving a motorcyclist or pedestrian, and placental abruption [19]. However, Bagou G *et al.* [9] have shown that, whatever the nature and violence of the initial trauma, three specific complications can be observed. They make all the seriousness of these situations and in all cases justify multidisciplinary management: placental abruption is present in 2% to 4% of minor trauma and up to 50% in severe blunt trauma. It can be delayed 24 - 48 hours. In our observation, the patient did not present placental abruption on ultrasound.

Placental abruption is linked either to hyperpressure or to a phenomenon of shearing of the placental insertion zone (between the uterus, soft structure, and the placenta, firm structure) during sudden deceleration movements as described in the modeling of road accidents. It should be suspected in the presence of any abdominal or lumbar pain, vaginal bleeding, or fluid loss, as well as the occurrence of uterine contractions. It can occur immediately or a few hours after the trauma. Fetal mortality is estimated at 20% - 35% [9]. Coagulation disorders are frequent in the mother (causing death in 1% of cases); uterine rupture: This can occur during violent abdominal trauma or during an accident with high kinetics (0.6% of cases). It is rare in the first trimester because the uterus is intra-

pelvic. A scarred uterus favors it, as well as an advanced gestational age. The maternal and fetal prognosis is grim: hemorrhagic shock is always present for the mother, and fetal death occurs in almost all cases; fetomaternal haemorrhage: is linked to the passage of fetal red blood cells into the maternal circulation and is responsible for sometimes severe fetal anemia. Severe trauma increases by four or five the risk of passage of fetal red blood cells and therefore the associated risk of maternal immunization of rhesus-negative patients. [9]. Ultrasound is currently the reference complementary examination which allows both to find intra-abdominal hemorrhage in the mother and to assess fetal vitality [20]. In our context health structures are under-medicalized, thus posing the problem of optimal care and diagnosis in these cases of trauma. Imaging examinations are not available on site. This review defect essential to Emergencies in search of placental abruption, uterine rupture and/or intra-abdominal hemorrhage compromises management and therefore the prognosis. In our observation the patient was moved to an imaging center for the realization of ultrasound with a monitoring of the fetal heart rate and uterine contractions were to evaluate every 4 hours and a brain scan.

The literature recommends [21] to search secondarily for fetal red blood cells in the maternal circulation using the Kleihauer-Betke test. Recently, it has been recommended to do this test in all traumatized pregnant women, because its positivity is directly associated with the risk of preterm delivery but its negativity does not eliminate the risk of perinatal complications, such as a retroplacental hematoma [22]. In our case, the Kleihauer-Betke test had not been performed. On the other hand, it is unreliable in the diagnosis of placental abruption [21]. During trauma in pregnant women, the risk of fetomaternal hemorrhage by transplacental passage of fetal red blood cells into the maternal circulation is multiplied by 4 or 5 compared to a normal pregnancy. It is rarely responsible for fetal haemodynamic distress with the death of the child by exsanguination, or fetal heart rhythm disorders. In the face of trauma, the positivity of this test seems to be a good indicator of a threat of premature delivery in all women, regardless of their rhesus. [23]. Similar results were obtained in the study by Barré M *et al.* [24]. management must be immediate and multidisciplinary based on close collaboration between emergency physicians, anesthetists-resuscitators, surgeons, obstetricians, pediatricians and neonatologists. It must respect the recommendations of the French Society of Anesthesia-Resuscitation (SFAR) and the French Society of Emergency Medicine (SFMU) [25] whatever the maternal situation, the management must also respect the recommendations in force, which the state of pregnancy does not modify, an obstetrical evaluation must be carried out as soon as possible. If this assessment shows signs of imminent delivery or signs requiring an immediate caesarean section, the birth should take place in the facility that received the woman first and the transfer should be organized in the immediate postpartum. If the woman is in the second half of pregnancy, it is recommended that she be placed in left lateral decubitus at least

during the initial assessment and transfer in utero. Left lateral decubitus improves both uteroplacental perfusion (and therefore fetal well-being) and venous return to the right atrium (which promotes cardiac output); if the woman has a non-life-threatening trauma, for example, a closed limb fracture without hemodynamic repercussions, she must be hospitalized in a traumatology or surgery department adapted to the trauma but located near an obstetric-pediatric unit. In these situations, it is quite simple to combine obstetrical and surgical care; if the woman has a life-threatening trauma, it is recommended to transfer pregnant women to a service adapted to the trauma (resuscitation, surgical specialties). The maternal prognosis must take precedence but it is recommended to adapt the treatments to their possible fetal or neonatal repercussions. [25].

4. Conclusion

Severe head injuries in pregnant women are rare and cause maternal and fetal mortality unrelated to pregnancy. The mechanism and kinetics of trauma can have serious maternal and fetal consequences in the absence of a diagnostic and therapeutic strategy. Management must be based on good multidisciplinary coordination, and close collaboration between emergency physicians, anesthesiologists-resuscitators, obstetricians, pediatricians, neonatologists and biologists. This maternal care must take into account the same elements as for any trauma in terms of evaluation of the severity taking into account the kinetics and the mechanism of the accident. It must be discussed in a collegial manner between all stakeholders so that the mother is not saved and the child she is carrying is condemned.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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