

Intrauterine antepartum fetal death. Medical, social and forensic implications

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Abstract: Although the phenomena of intrauterine antepartum fetal death is unexplainable in 60% of cases, it has been very little studied. The authors made a macroscopic and microscopic anatomic study on 72 fetus-placenta systems that had intrauterine antepartum fetal death. The analysis of fetus-placenta relations and the study of phenotype changes undergone by fetus and placenta were carried out on two time periods of gestation: 9-20 weeks and 21-36 weeks both in case of unique fetus pregnancies as well as twin pregnancies. Based on personal observation and international classical and contemporary literature, the authors consider that the phenomena of intrauterine antepartum fetal death raises many theoretical and practical problems related to the establishment of gestational age, to the evaluation of fetus viability limit and last but not least to the ethical status of the product of "conception" (zygote, embryo, fetus) as a human being and its admittance as a juridical personality. The authors noticed that the synchronism between the fetus-placenta structures draws the attention on the causality relations between them during unique fetus and twin pregnancies.

Key Words: fetus, fetus-placenta system, antepartum fetal death, viability, ethics.

Disruption of growth and differentiation processes in zygote, embryo or fetus may occur at any moment in during intrauterine gestational evolution. Antepartum intrauterine death of fetuses has been little studied. This phenomenon is determined by multiples factors and leads to complex social, psychological and forensic implications [1]. Although there is a great variability regarding the terminology used to describe this phenomenon, still, the semantic content is the same: "Fetal death in utero"; "Antepartum fetal death"; "Fetal demise"; "Stillbirth"; "Stillborn", referring to fetal stage of ontogenesis, and other terms draw the attention over unexpected occurrence of the phenomenon in all stages of intrauterine ontogenesis: "Sudden antenatal death"; "Sudden antenatal death syndrome"; "Sudden unexplained death" or "Spontaneous abortion" [2-8].

The necessity of studying antepartum death

causes of conception product is imposed on one side by the legitimate expectations of parents about knowing the cause and the probability of recidivate in a new gestation and on the other side, for establishing the monitoring protocol and intensive therapy for the next pregnancies. Our purpose was to perform a macro- and microanatomic analysis on fetuses that died in antepartum intrauterine stage and over phenotypic transformations of placental structures which could reveal the causes of antepartum death.

Selection and analysis procedures regarding phenotypic transformations of fetus-placental structural system lead to various theoretical and practical issues:

Why are there different nomination criteria in time and space for intrauterine ontogenesis stages within morphological sciences and clinical obstetrics: zygote, embryo and fetus?

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Could intrauterine ontogenesis stages be rigorously overlapped within trimester calendar of gestation?

Which are de fetus's viability limits?

Which are the evaluation criteria of antepartum deceased fetus?

Which are the life rights of premature at the edge of viability?

Is the fetus a human being considered as legal (juridical) personality?

MATERIAL AND METHODS

The study was conducted on a group of 72 antepartum deceased fetuses: 19 cases with gestational age between 9 and 20 weeks; 24 cases with gestational age between 24 and 36 weeks and 20 cases with malformations. Fetuses, together with placentas, were prepared in 10% formaldehyde solution. Somatoscope examination of fetuses consisted of: external configuration analysis (tegument, hair, stature proportions, position of superior and inferior limbs). Somatometric determinations were performed by measuring vertex-coccyx length and body weight.

Microanatomic study of placentas was performed on fragments prepared with 5% buffered formaldehyde solution, pH 7.2 and included in paraffin by classical method. Seriate sections of 5 microns thickness were stained with Hematoxylin-Eosin coloration- for microanatomic orientation and with van Gieson for the visualization of picrofusinofile structures.

Sections were examined with Nikon Eclipse 80i microscope. Microanatomic images were achieved by Nikon Digital Sight DS-Fi1 High Definition Color Camera Head, using Nis Elements Advanced Research software. Macroanatomic images were achieved by Digital Camera EOS 1ds Mark II, equipped with Macro Ultrasonic Lens EF 100mm, F/28.

RESULTS

We grouped the results of our observations into 6 subchapters which included differentiated

macro- and microanatomic analysis regarding: relations between fetus and placenta in 9-20 weeks of gestation period; fetuses' external configuration in 21-36 weeks of gestation; macroscopic phenotypic transformations in monoamniotic and monochorial fetal-placental system, in single fetus and also in twin fetuses cases; microanatomic phenotypic transformations of placental structures and malformations of fetuses deceased in uterus.

A. Analysis of fetuses and placental relations between 9 and 20 weeks of gestation

In 9 weeks fetuses, amniotic sack is present and filled with amniotic liquid. After its dissection, we extracted the fetus, with a vertex-coccyx length of 5 cm+/- 2 mm and a weight of 9 g+/-1. Cephalic extremity, in anterior flexion position, is voluminous, representing half of fetus height. Eyes, nose and mouth are differentiated. External genital organs are undifferentiated. Intestinal loops are exteriorized and visible at the proximal extremity of umbilical cord level (physiologic hernia) (Fig.1A).

In 10 weeks fetuses, amniotic sack is present and covered by chorionic membrane; placenta is well differentiated. After sectioning embryonic annexes, we visualized the fetus, with a vertex-coccyx length of 6 cm+/- 2 mm and a weight of 14 g+/-1. External appearance of fetuses is dominated by the voluminous cephalic extremity. Superior limbs are proportionally differentiated and possess at their distal extremity a palette shaped hand. Inferior limbs are shorter than the superior ones, in a slightly extension, in contrast with superior limbs, which are in triple flexion position. Eyes are developed and located inside orbits; eyelids are visible. Cervical curvature has an angle of 20 degrees (Fig. 1 B and C).

The 14 weeks fetuses were extracted from uterine cavity, together with placenta and amniotic sack. Average vertex-coccyx length is 12 cm+/-1 and average weight is 109 g+/-2. Cephalic extremity reaches 1/3 of fetuses' height. Superior and inferior limbs are in triple flexion. One of the 4 examined fetuses has a nuchal circular of umbilical cord. The head is hairless (Fig. 1 D and G).

Table 1. Repartition of studied cases on criteria such as: moment of occurrence and age

Group	Age (Weeks)	Number of cases					
		Single fetus	Total	Twins		Malformations	Total
Early AIUFD	9	3			T		
	10	2		-			
	14	6		-			
	16	6		5			
	20	2	19	4	9	20	48
Intermediate AIUFD	24	9					
	28	6	15				15
Late AIUFD	32	5					
	36	4	9				9
TOTAL	-	43		9		20	
GENERAL TOTAL				72			

AIUFD= Antepartum in utero fetal death



Figure 1. Relations in space during the first and second trimester, between placenta structures in unique fetus, mono amniotic, mono chorial gestations. A: 9 weeks fetus included inside amniotic sac; B: 10 weeks fetus included inside placenta system of an extra uterus pregnancy located inside salpinx; C: Posture and external configuration of a 10 weeks fetus; D and G: 14 weeks fetus included inside amniotic sac (D) and with circular umbilical chord (G); E and H: 16 weeks fetus included inside amniotic sac (E) and after extraction (H); F and I: 20 weeks fetus included inside amniotic sac (F) and after extraction (I). 1. Amniotic sac; 2. Amnion; 3. Fetus included inside amniotic sac; 4. Fetus extracted from amniotic sac; 5. Placenta; 6. Chorionic membrane; 7. Umbilical chord. Macrophotographs with Canon EOS 1 ds Mark II digital Camera, Macro Ultrasonic Lens, EF 100 mm, F/2,8.

The 16 weeks fetuses, incorporated within amniotic sack, were examined after their extraction from amniotic sack by sectioning the chorionic membrane and amnios. Average vertex-coccyx length is 14 cm $\pm$ 1 and average weight is 198 g $\pm$ 2. Superior and inferior limbs are proportionally developed, in triple flexion. Tegument is pinky colored, covered by lanugo and vernix caseosa. Calvaria is covered with hair. Cephalic-thoracic curvature is accentuated (Fig. 1 E and H).

Two 20 weeks fetuses were examined after their extraction from amniotic sack. Average vertex-coccyx length is 18 cm $\pm$ 1 and average weight is 430 g $\pm$ 6. Body flexure is accentuated, superior and inferior limbs are in forced triple flexion and they reach through their extremities, the cephalic extremity. There is a cord, circularly around leg and thigh of left inferior limb. Equally, it is noticed the presence of hair at eyebrows and calvaria level. Body surface is covered by lanugo and vernix caseosa (Fig. 1 F and I).

B. Microanatomic analysis of external configuration of fetuses at 24-36 weeks of gestation

There were examined 23 fetuses, aged between 24 and 36 weeks of gestation: 8 fetuses of 24 weeks, 6 fetuses of 28 weeks, 5 fetuses of 32 weeks and 4 fetuses of 36 weeks of gestation. We noticed that the 24 weeks fetuses have an average vertex-coccyx length of 22 cm $\pm$ 1 and an average weight of 810 g $\pm$ 5. There can be observed a proportionally development of body parts. Superior and inferior limbs are in triple flexion. Tegument is wrinkled, but translucent, colored from pink to red tones. Capillary subcutaneous network is well visible (Fig. 2).

In 28 weeks fetuses, we have noticed: disappearance of face wrinkles, scalp hair abundance and an increased level of subcutaneous fat. Eyes are covered by eyelids. Inferior and superior limbs are in accentuated triple flexion. Lanugo and vernix caseosa are found at tegument's surface (Fig. 2). Average vertex-coccyx length is 25 cm $\pm$ 2 and average weight is 1250 g $\pm$ 50.

Within the group of 36 weeks fetuses, we recorded an average vertex-coccyx length of 32.5 cm $\pm$ 1 and an average weight of 2750 g $\pm$ 10. Tegument is smooth and has a pinky color. Thorax is globular, breasts are prominent, testicles are descended into scrotum in 2 male fetuses, and scalp hair is very well represented. Superior and inferior limbs are in accentuated triple flexion; hands and feet go together around the head (Fig. 2).

C. Macroanatomic analysis of phenotype transformations in monoamniotic and monochorial single fetus fetal-placental system

From the total group of antepartum, in uterus, dead fetuses (43 cases), a number of 8 cases draw our attention, by the magnitude of fetus and placenta phenotypic transformations. Macroanatomic examination of fetuses allowed the visualization of

three phenomena: modifications in limbs position, maceration and mummification. In 3 fetuses, with estimated age of 16 gestation weeks, we noticed the absence of head's anterior flexion and absence of inferior limbs triple flexion. The body is flask; inferior and superior limbs, in extension (Fig. 3 A, C, D).

In 2 fetuses, with estimated age of 24 gestation weeks, we visualized maceration processes: generalized edemas, skin paleness, presence of torn subepidermal serous-bloody bubbles and, in addition to this, joints relaxation which allowed modifications in limbs position (Fig. 3 E).

At placental level, we observed the presence of fibrinoid deposits, on maternal aspect of placenta (Fig. 3 J-L), thrombosis of umbilical vessels (Fig. 3 M, N), interlobular fibrinoid deposits (Fig. 3 N) and placental infarction areas (Fig. 3 O). Umbilical cord has a spiral trajectory, with strictures at its proximal extremity level, nodes and also parceled necrosis (Fig. 3 D, H, I).

D. Macroanatomic analysis of twin fetuses' fetal-placental system

Analysis of 9 twin fetuses' cases allowed us to identify three types of fetuses-amnion and chorionic membrane relations: diamniotic-dichorial (3 cases), monoamniotic-monochorial (2 cases), diamniotic-monochorial (2 cases) and threeamniotic-monochorial (2 cases).

In diamniotic-dichorial twin cases, it is easily observed the presence of two separated placentas and 2 fetuses of the same sex, with gestational age of 16 weeks. The position of limbs is variable: superior limbs are in extension in both fetuses, inferior limbs are in different positions: thigh in abduction, leg and foot in flexion at the first twin; triple flexion at the second twin (Fig. 4 A).

In monoamniotic-monochorial twin cases, we identified a single placenta, a single amniotic sack and a single chorionic membrane. The two umbilical cords insert onto placenta into two close locations. Fetuses are the same sex, with gestational age of 16 weeks. One of the two fetuses has a facial malformation-cheilognathopalatoschisis. Position of limbs is variable: superior limbs are in extension, inferior ones have thighs in abduction and lateral rotation, legs and feet in flexion (Fig. 4 B).

In diamniotic-monochorial twins, we identified a single placenta, with 2 amniotic cavities, separated by a translucent septum. Dissection of umbilical vessels allowed us to visualize anastomosis that could assure blood transfusion between placentas. Fetuses have different external configurations: by tegument color, height, superior and inferior limbs position (Fig. 4 E).

Maternal aspect of placenta in twin cases contains variable areas of fibrinoid deposits at the surface (Fig. 4 C, D).



Figure 2. Postural synergy of dead fetus inside uterus during the third trimester of intrauterine gestation. One can notice the triple flexion of limbs under variable angles: arm anteflexion, forearm flexion and pronation, hand flexion for superior limbs and thigh maximum flexion on trunk, leg and foot flexion for the inferior limbs. Macrophotographs with Canon EOS 1 ds Mark II digital Camera, Macro Ultrasonic Lens, EF 100 mm, F/2,8.

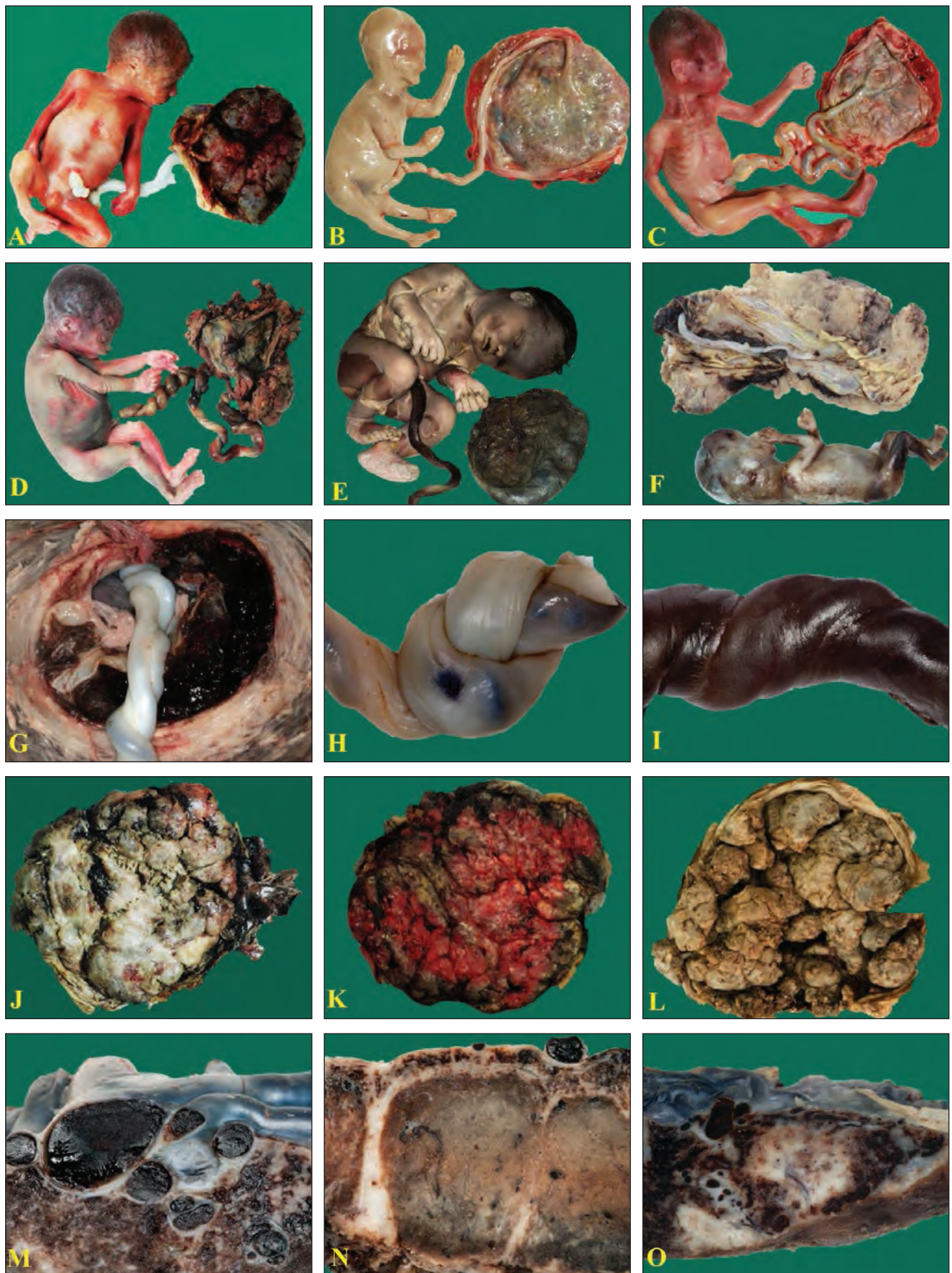


Figure 3. Phenotype changes inside mono-amniotic, monochorial fetus-placenta system with unique fetus, dead inside uterus during the second and third trimester of gestation. A-F: Changes of posture and external configuration of fetus due to deflexion of limbs and maceration; G: Prolapse of umbilical cord and hematoma behind placenta; H: Knot of umbilical cord; I: Necrosis of umbilical cord; J-L: Fibrinoid deposits at the level of placenta lobes; M: Thrombosis of umbilical vessels; N: Fibrinoid located inside placenta lobe; O: Area of placenta infarction. Macrophotographs with Canon EOS 1 ds Mark II digital Camera, Macro Ultrasonic Lens, EF 100 mm, F/2,8.

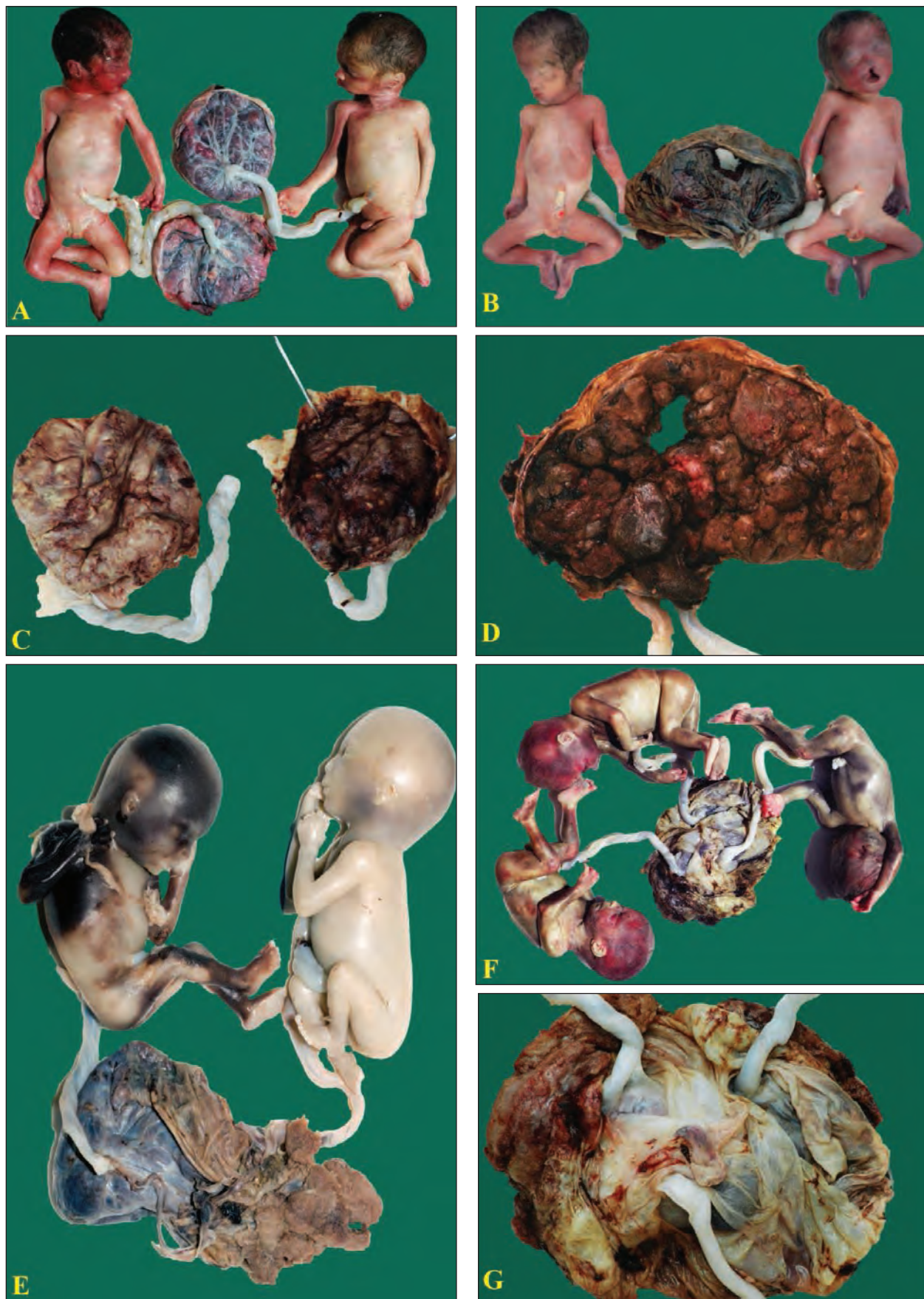


Figure 4. Relations between fetus and placenta and phenotype changes inside fetus-placenta system of twin pregnancy. A: Diamniotic, dichorial twin pregnancy; B: Monoamniotic, monochorial twin pregnancy; C: Fibrinoid deposits on mother side of placenta in a diamniotic, dichorial pregnancy; D: Fibrinoid deposits on mother side of placenta in a monoamniotic, monochorial pregnancy; E: Diamniotic, monochorial twin pregnancy; F: Triamniotic, monochorial twin pregnancy; G: Space relations between the amniotic cavities in triamniotic, monochorial twin pregnancy. Macrophotographs with Canon EOS 1 ds Mark II digital Camera, Macro Ultrasonic Lens, EF 100 mm, F/2,8.

E. Microanatomic analysis of phenotypic transformations in placental structures with dead fetus inside uterus

Regarding microanatomic analysis of dead fetuses inside uterus placenta, our concern was the study of fibrinoid-vascular and interfibrinoid-villous interrelations. When examining with the X 10a objective, seriate sections stained with Hematoxylin-Eosin and van Gieson, we observed a thickening of amnion mesenchyme and the presence of focal metaplasia areas within amnion epithelium, leading to nodosities (Fig. 5A). In the sector underlying chorionic plate, fibrinoid substance has an organized appearance, as “Langhans fibrinoid stria” [9], which extends around subchorionic blood vessels and circle them (Fig. 5 B, C). The same fibrinoid distribution was also noticed around basal plate, as “Nitelbuch fibrinoid layer” [10]. Within this sector, fibrinoid substance forms a veritable adventitia for blood vessels located inside placental septum (Fig. 5 D, H). Inside intervillous spaces, we identified bridges of fibrous substance between adjacent placental villousities which possess no trophoblast (Fig. 5H). Equally, we noticed a narrowing of arteriolar and metaarteriolar lumen (Fig. 5G).

F. Analysis of malformations variability in fetuses dead in uterus

Macroscopic analysis of 20 fetuses dead in uterus, with malformations, highlighted a great variability of pathologic morphogenesis: inferior celiosoma (major type) associated with total encephalon-mieloraphy (Fig. 6 A, B); achondroplasia (Fig. 6 C); total celiosoma associated with ectromelie (Fig. 6 D, F); total encephalon-mieloraphy (Fig. 6 E, G, I); anencephaly (Fig. 6 J) and cyclocephaly diophalme proboscis.

DISCUSSION

A. Considerations on “antepartum in utero fetal death” concept

Definition of “antepartum in utero fetal death” concept is variable, according to different authors. In order to avoid discordances, experts of World Health Organization (1977) [11] proposed the following definition: “intrauterine death of fetus represents death occurred before expulsion or extraction out of the uterus, independent from gestation period; death is declared by the absence of: breathing, heart beats, umbilical cord pulsations or voluntary muscles contractions.

Leridon (1987) [12] classified “antepartum intrauterine death of fetuses” cases according to the moment of occurrence, in three classes: early (before 22 weeks of gestation), medium (between 22 and 28 weeks of gestation) and late (after 28 weeks of gestation). World Health Organization (1978) [13] adopted this classification, but introduced, for every class, a new parameter: body weight, as follows: 500g for early class,

500-1000g for medium class and >1000g for late class.

World Health Organization (1992) [14] analysis again the problem of “intrauterine death of fetuses” and states that it can appear in any moment during pregnancy and rejects the possibility to be related with a certain gestational age (16; 20; 22; 24 or 28 weeks) or a certain fetus weight (350g; 400g; 500g or 1000g).

Still, in United States of America, it is considered “fetal death” the death of a fetus with a weight of 350 g or after 20 weeks; in Australia, with a weight over 400 g or after more than 20 weeks of pregnancy, in Ireland with a weight over 500 g or after 24 weeks of pregnancy. In other countries (like Netherland, England, Scotland, North Ireland) is taken into account only the gestational age over 24 weeks, without considering the weight [16, 17, 21].

Still, in current practice, a gestational age criterion is mandatory, for classification: in “spontaneous abortion”, when it occurs before the 20th gestational week and in “fetal demise” or “stillbirth” after the 20th gestational week.

B. Medical, social and forensic issues of “antepartum in utero fetal death”

According to our analysis, classical and contemporaneous literature data, “antepartum in utero fetal death” phenomenon raises various theoretical and practical issues, regarding: 1. Calculation of gestational age; 2. Fetal viability limit and the establishment of assessment parameters in premature born at the edge of viability; 3. Ethics of “embryo” and “fetus” status as human being and their recognition as legally personality.

1. Calculation of gestational age

“International Classification of Diseases (10th Revision-2008)” [18] defined gestational age as postmenstrual age, expressed in week and days. Gestational age calculation is based on somatometric data (anatomic or ultrasound) and/or anamnestic indications regarding the date of last menstruation [19]. In order for the method to be precise, there must be added 4 days in the case of ultrasonography and 14 days in anamnestic.

2. Viability limits of fetuses

Viability is fetus capacity to survive in extrauterine environment. Viability limit of fetus is variable according to different authors and institutions responsible for the assessment of fetus possibilities to survive in extrauterine environment.

The main criteria of “World Health Organization” (1977) [11] in the definition of viability concept are: gestational age of fetus to be 22 weeks, weight of fetus to be at least 500 g and after expulsion, to breathe or to manifest all signs of life: fetal heart beats, umbilical cord pulsations or voluntary muscles contraction. It is considered that this fetus must be declared as born alive.

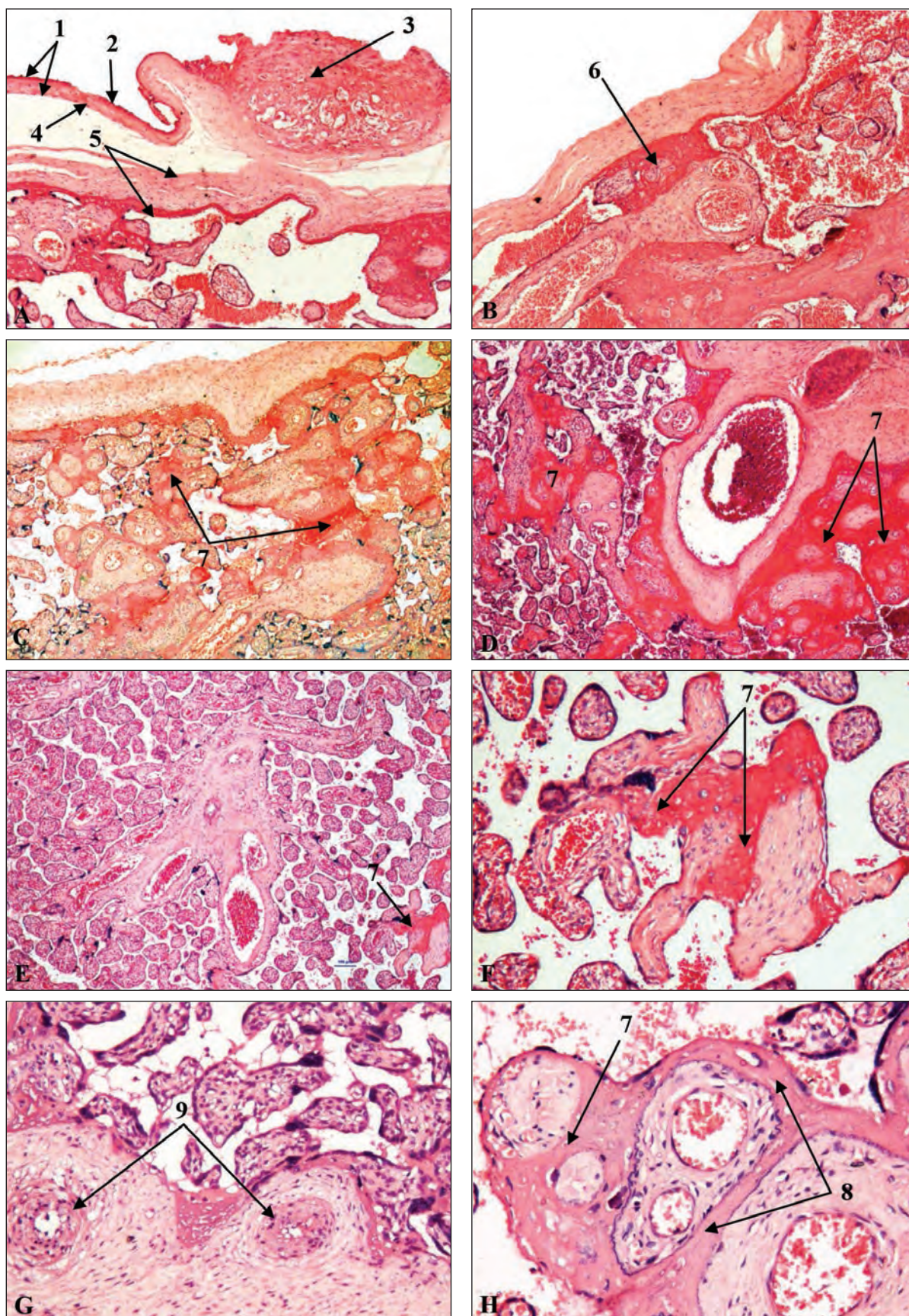


Figure 5. Microanatomic phenotype changes inside placenta structures after intrauterine fetus death; metaplasia of amnion epithelium with villositities (A); thickened amnion mesenchyme (B, C); fibrinoid under the internal layer of chorion lamina (B), around blood vessels (D, H) and between placenta villositities (E, F, H); diminished lumen of small arteries (G). 1. Amnion; 2. Epithelium amnioticum; 3. Amniotic node; 4. Mesoderma amnioticum; 5. Lamina chorionica; 6. Subchorial fibrinoid; 7. Intervillous fibrinoid; 8. Perivascular fibrinoid; 9. Arteries with narrowed lumen. Paraffin sections. Hematoxyline-Eosin stain. Microphotographs taken with Nikon Digital Sight DS-Fi1 High Definition Color Camera Head. Oc. 7, Ob 4 (C, E), 10 (A), 20 (B, F, G), 40 (D, H), x28 (C, E); x70 (A), x140 (B, F, G), x280 (D, H).



Figure 6. Variable malformations of dead fetus inside uterus. A, B: Inferior celosomie (severe case) associated with total encephalon-myloraphie; C: Acondroplasia; D, F: Total celosomie associated with ectromelie; E, G, I: Total encephalon-myloraphie; H: Fronto-parieto-occipital encephalocele; J: Anencephalon; K: Cyclocephal diophalme with proboscis. Macrophotographs with Canon EOS 1 ds Mark II digital Camera, Macro Ultrasonic Lens, EF 100 mm, F/2,8.

Still, the signs of life, temporal and spatial parameters mentioned by World Health Organization (1977) [11] are more likely signs of vitality rather than of viability, the presence of anatomic and physiologic conditions, which are necessary and enough for a certain life duration and/or therapeutic support for defining morphologic-functional parameters [20].

In these conditions, declaration of fetuses with gestational age under 23-24 weeks can be improved, leading to perinatal death decrease. For the accomplishment of these conditions, premature care at the edge of viability (22-26 weeks of gestation) must be adapted. According to this fact, proper recommendations have been elaborated by the Experts Comity of "Societe Suisse de Neonatologie" [21] and approved by "Central Ethics Comity of Medical Sciences Academy, Switzerland", as follows: premature with gestational age under 24 weeks may receive palliative care and the ones over 24 weeks must be submit to intensive care, provisional, assured by trained neonatology doctors with the purpose of premature status evolution assessment.

Until 1975, World Health Organization [25] considered as viability limit a gestational age of 28 weeks and a weight of 1000 g. In Romanian current forensic practice, it is considered that a fetus is viable if he/she has a length of 38 cm and a weight of 1400 g [26] or 1500 g [27, 28]. Professor Vladimir Belis, honorary president of Romanian Forensic Society, observed that penal legislation doesn't establish minimal constant criteria for viability assessment, based on body development of intrauterine life duration. In this situation, controversies and theoretical discussions represent a reduced importance in medical-forensic practice [27].

3. Ethics regarding "embryo" and "fetus" status

Ethical issues regarding "embryo" and "fetus" statuses are related to discussion about the establishment of the point (moment) from which they can be considered as human being.

Epigenesis of human being begins with the fecundation moment and progress in time and space, based on "genetic code" information. This dominant concept in biology was adopted by "Juridical Comity and for Human Rights" of European Council (1996) [29] which accepted that human being begins with the moment of "fecundated egg".

Although, laic philosophic thinkers and also some catholic theologies, based on blastomers omnipotence, consider that human being begins its existence in a post-fecundation moment, which corresponds to nidation. This assertion is false because the moment of nidation continues and do not begins the ongoing of "genetic code" information. In France, National Consultancy Committee declares embryo and fetus as potential human beings, which offers them protection and the status of legal personality.

Moral legitimacy of in vitro embryos experiments is one of the most intensively debated issues of bioethics. A project of Directorial Committee for Bioethics of European Council (1990) [30] recognized this difficulty and lets the decisions into the hands of national laws, still, with a certain specification: research is only authorized on embryos which are developed until the age of 14 days. Also, this statement is false because they are actually authorizing experiments not on embryos, but on information existent in the genetic code, in evolution, in all ontogenesis stages.

So, antepartum, intrapartum or postpartum death fetuses must be treated with respect from expulsion moment until releasing the dead body to the family.

C. Observation over phenotypic transformations of fetal-placental system structures

In macro and microanatomic analysis of 72 antepartum fetal death cases, we observed: modifications of spatial relations in fetal-placental structures at single fetus and twin gestations; microanatomic phenotypic transformations of placental structures and the existence of a great variability of malformations in fetuses dead in uterus.

In girls assessment, the estimated age was established taking into account somatometric data (vertex-coccyx distances and weight), the study of postural synergic signification of superior and inferior limbs, estimation of differentiation degree based on somatoscopic observations (presence and distribution of pilosity and vernix caseosa; presence, quantity and topography of subcutaneous fat), presence of mummification phenomenon and of maceration processes, both in single and twin gestations.

Phenotypic transformations of functional placental structures have been observed both at macro and microanatomic level. A special attention was paid to the evaluation of fibrinoid substance spatial distribution, to vascular-fibrinoid and fibrinoid-villous interrelations. Tissue interrelations established during hemochorial placental barriers evolution, as well as fibrinoid substance temporal-spatial distribution significance, amnios, chorial plate, trophoblast membrane, have been analyzed and discussed in prior works [31-33].

Special attention was paid to malformations typology analysis of antepartum dead fetuses. Nosologic classification of studied cases was difficult because of the great variability of anatomic-clinical criteria for the assessment of antepartum dead fetuses groups.

CONCLUSION

1. The study of the phenomena of intrauterine antepartum fetal death is not considered a purpose of its own. It must bring arguments for the knowledge of viability limits as well as for the elaboration of

somedecisions regarding the rights and protection of the product of conception during all the stages of its ontogenesis (antepartum), between the moments of fecundation up to parturition.

2. The corroboration of data obtained from clinical, macroscopic and microscopic morphologic, and ultrasound observations, can ensure the stringency for establishing the gestational age, the evaluation of fetus viability limits and the phenotype changes undergone by fetus-placenta system.

3. The synchronism of lesions suffered by fetus-placenta systems draws the attention on the causality relations between those structures in unique fetus and twin pregnancies.

4. The fibrinoid substance from placenta structure plays an important role in the remodeling of space relations between chorionic villi and blood vessels and disturbs the fetus-placenta and mother-placenta circulation with consequent direct effects on the morphologic growth and differentiation of fetus.

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