Delayed villous maturation

Sampling and Definitions of Placental Lesions

ECP-Conference Amsterdam 2-7th september 2017

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Content

• Overview placental function
• Development
• Maturation overview
• Delayed maturation in literature
• Amsterdam consensus
• Cases
Placental function

- gas and waste exchange (lungs/kidney)
- nutrient transport (gut)
- immune protection
- hormone synthesis (liver/pancreas/kidney)
- endogenous and xenobiotic metabolism (liver)
Placental development and maturation

Maternal decidua

Fetal chorionic plate
Placental development

Fetal chorionic plate

Maternal basal plate

primary secondary tertiary
Gestational week 5/6
Gestational week 9/10
Gestational week 16

Medium diffusion distance 40nm)
Gestational week 24

Medium diffusion distance 20nm
Gestational week 32
Gestational week 36

Medium diffusion distance 11.7nm)
Gestational week 40

Medium diffusion distance 4.8 nm
Of 71 stillbirths, 34 due to parenchyma loss and 37 due to maturation defect.

Delayed villous maturation is associated with both gestational and pregestational diabetes mellitus and with prenatal death and IUFD.
Gene markers of normal villous maturation and their expression in placentas with maturational pathology

Katherine Leavey a, Samantha J. Benton b, David Grynspan c, Shannon A. Bainbridge b, d, Eric K. Morgen e, f, **, Brian J. Cox a, g, *

Molecular gestational age was older in accelerated maturation (5.3 weeks) and younger in delayed maturation on histology (1.1 week).
Amsterdam Placental workshop group consensus 2014
Guidelines cover

- Maternal vascular malperfusion
- Fetal vascular malperfusion
- Delayed villous maturation
- Patterns of ascending intrauterine infection, and
- Villitis of unknown etiology (VUE)

and reporting

Applicable by general practice pathologists in tertiary centers, community hospitals and district general hospitals, scientific research community.

Ongoing developments in understanding of the pathology of the placenta, scientific bases of the maternofetoplacental triad, and clinical significance of defined lesions may necessitate further refinements.
Delayed Villous Maturation
villous maturation defect, variable villous maturation, or villous dysmaturity

- monotonous villous population (defined as at least 10 such villi) with centrally placed capillaries and decreased vasculosyncytial membranes, recapitulating the histology in early pregnancy
- present in 30% of 1 full-thickness parenchymal slide
- Grading:
  - focal: lesion in 1 full-thickness parenchymal slide
  - diffuse: presence in 2 or more full-thickness slides
- Thresholds for significance of this lesion are unclear at present
- grading may help to determine the appropriate levels
Case 1- clinical history

- Mother 32 years
- Gravida 3, Para 2
- IUFD in gestational week 40+6
Macroscopy

- Placenta 405gr
- Area: 18 x 15 x 2cm: 212cm²
- Pale cut surface, greenish miscoloured membranes

Autopsy

- Mature still born child without any maceration
- 3045gr, 52cm SFL
- Suggestive signs for intrauterine anoxia
Diagnosis

Delayed villous maturation
Case 2 – clinical history

- Mother 28 years
- G1P0, IVF
- Adipositas
- IUFD in gestational age 37+6
Macroscopy - placenta

- 380gr (p10)
- Basal area 16 x 15 x 2cm: 188cm² (p10)
- Focally pale cut surface
GW 37 + 6
Diagnosis

Delayed villous maturation (focal)
Take Home message

- Maturation disorders only can be diagnosed if the clinical gestational age is given!!

- No placental diagnosis without information about gestational age

- Delayed villous maturation plays an important role for fetal outcome

- ….it is defined of the Amsterdam workshop consensus (article!)

- Further discussion and consensus about cut-off is needed
Thanks for your attention - Vielen Dank für Ihre Aufmerksamkeit - Mange takk!

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