Placenta

see Placental alkaline phosphatase.

The placenta (also known as afterbirth) is an organ that connects the developing fetus to the uterine wall to allow nutrient uptake, provide thermo-regulation to the fetus, waste elimination, and gas exchange via the mother's blood supply, fight against internal infection and produce hormones to support pregnancy. The placenta provides oxygen and nutrients to growing babies and removes waste products from the baby's blood. The placenta attaches to the wall of the uterus, and the baby's umbilical cord develops from the placenta. The umbilical cord is what connects the mother and the baby. Placentas are a defining characteristic of placental mammals, but are also found in some non-mammals with varying levels of development.

The homology of such structures in various viviparous organisms is debatable and, in invertebrates such as Arthropoda, is analogous at best.

The word placenta comes from the Latin word for cake, from Greek πλακόεντα/πλακοῦντα plakóenta/plakoúnta, accusative of πλακόεις/πλακούς plakóeis/plakoús, “flat, slab-like”, in reference to its round, flat appearance in humans. The classical plural is placentae, but the form placentas is common in modern English and probably has the wider currency at present.

Prototherial (egg-laying) and metatherial (marsupial) mammals produce a choriovitelline placenta that, while connected to the uterine wall, provides nutrients mainly derived from the egg sac.

The placenta functions as a fetomaternal organ with two components: the fetal placenta (Chorion frondosum), which develops from the same blastocyst that forms the fetus, and the maternal placenta (Decidua basalis), which develops from the maternal uterine tissue.

Ribeiro de Oliveira et al, describe a training model for neurointerventional techniques using the human placenta (HP), which affords haptic training with significantly fewer resource requirements, and discuss its validation.

Twelve human placentas (HPs) were prepared for simulated endovascular techniques. Training exercises performed by interventional neuroradiologists and novice fellows were placental angiography, stent placement, aneurysm coiling, and intravascular liquid embolic agent injection.

The endovascular training exercises proposed can be easily reproduced in the HP. Face, content, and construct validity were assessed by 6 neurointerventional radiologists and 6 novice fellows in interventional radiology.

The use of HP provides an inexpensive training model for the training of neurointerventionalists. Preliminary validation results show that this simulation model has face and content validity and has demonstrated construct validity for the interventions assessed in this study [1)].

Steroids readily cross the placenta, and fetal adrenal hypoplasia may occur with the administration of large doses during pregnancy.

Warfarin crosses the placenta and is teratogenic, causing birth defects in 5–30%, including fetal warfarin syndrome during 1st trimester (including scoliosis, brachydactyly, vertebral column calcifications, ventriculomegaly, agenesis of the corpus callosum) and spasticity/seizures and eye defects after the 1st trimester.

1)
Ribeiro de Oliveira MM, Nicolato A, Santos M, Godinho JV, Brito R, Alvarenga A, Martins AL, Prosdocimi A, Trivelato FP, Sabbagh AJ, Reis AB, Maestro RD. Face, content, and construct validity of human placenta as a haptic training tool in neurointerventional surgery. J Neurosurg. 2015 Oct 9:1-7. [Epub ahead of print] PubMed PMID: 26452122.