Types of Placenta

Epitheliochorial type:

This type is the most superficial placenta and lacks significant invasion of the uterine lining. Pockets of columnar trophoblasts are loosely applied to the maternal endometrial epithelium. No destruction or invasion of the maternal tissues occurs and no layers are removed. The epitheliochorial type is found in horses, pigs and ruminants. Although there is some controversy over the evolution of the placenta, it is considered that the common ancestor of living placental mammals had a moderately invasive placenta of the endotheliochorial type. The syndesmochorial type is a placenta from which the endometrial epithelium is removed after implantation and was added to the placental classification list for a while. However, electron microscopic examination eliminated this type from the classification because it is never found in the interhemal regions. On the other hand, some reports have described that the syndesmochorial placenta is an unusual type of placenta for ruminants: some specific trophoblasts (the binucleate cells) fuse with a single uterine epithelial cell, giving rise to trinucleate cells or even multinucleate structures of mixed fetal and maternal origin.

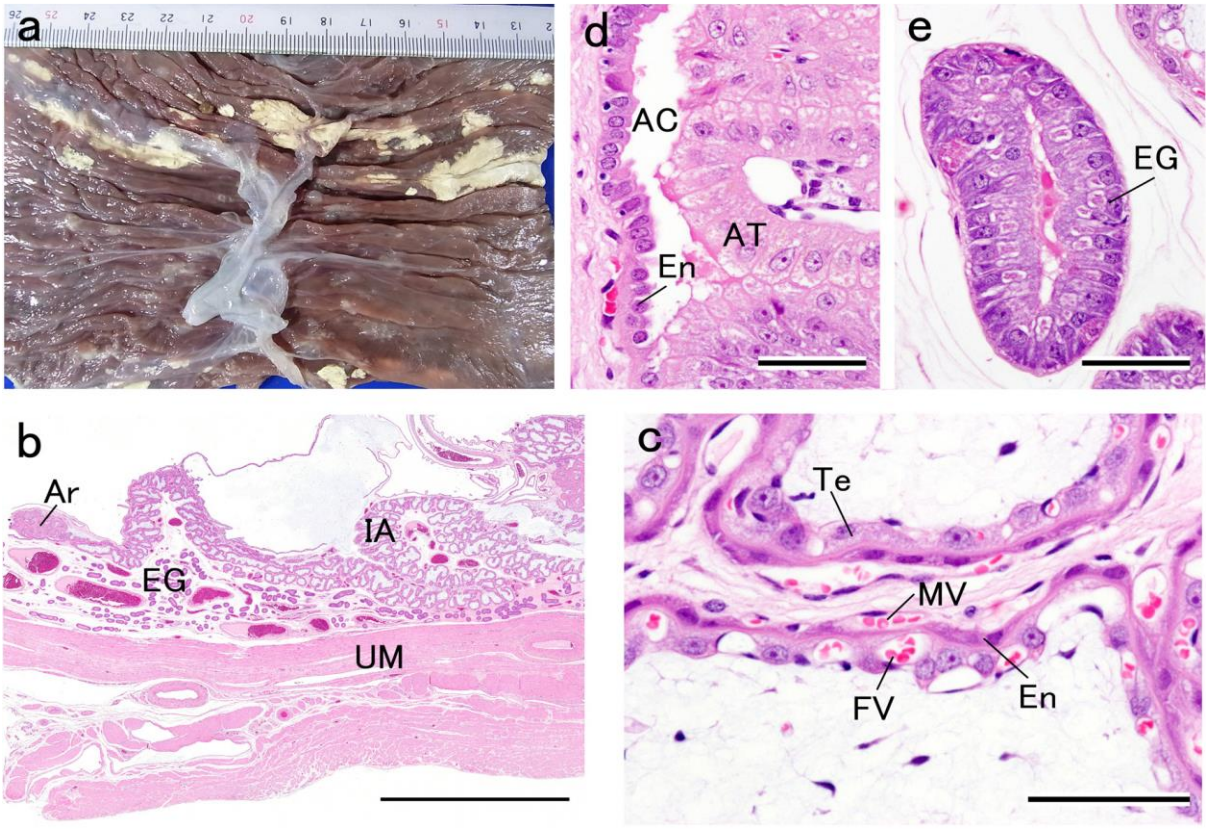

Fig. Pig (minipig) placenta. Epitheliochorial type placenta. a) Gross appearance on gestation day 100. b) Histological section at low magnification. HE stain, bar=3 mm. c) Interhemal area. HE stain, bar=60 μm. d) Areolus. HE stain, bar=60 μm. e) Endometrial gland. HE stain, bar=60 μm. AC, areolar cavity; Ar, areolus; AT, areolar trophectoderm; EG, endometrial gland; En, endometrium; FV, fetal vessel; IA, interhemal area; MV, maternal vessel; Te, trophectoderm; UM, uterine muscle.

Endotheliochorial type:

The maternal uterine epithelium and connective tissue disappear after implantation, and the trophoblasts come into direct contact with the maternal endometrial. The endotheliochorial type occurs in orders from all four major clades of eutherian mammals (Euarchontoglires, Laurasiatheria, Xenarthra and Afrotheria), including carnivores.

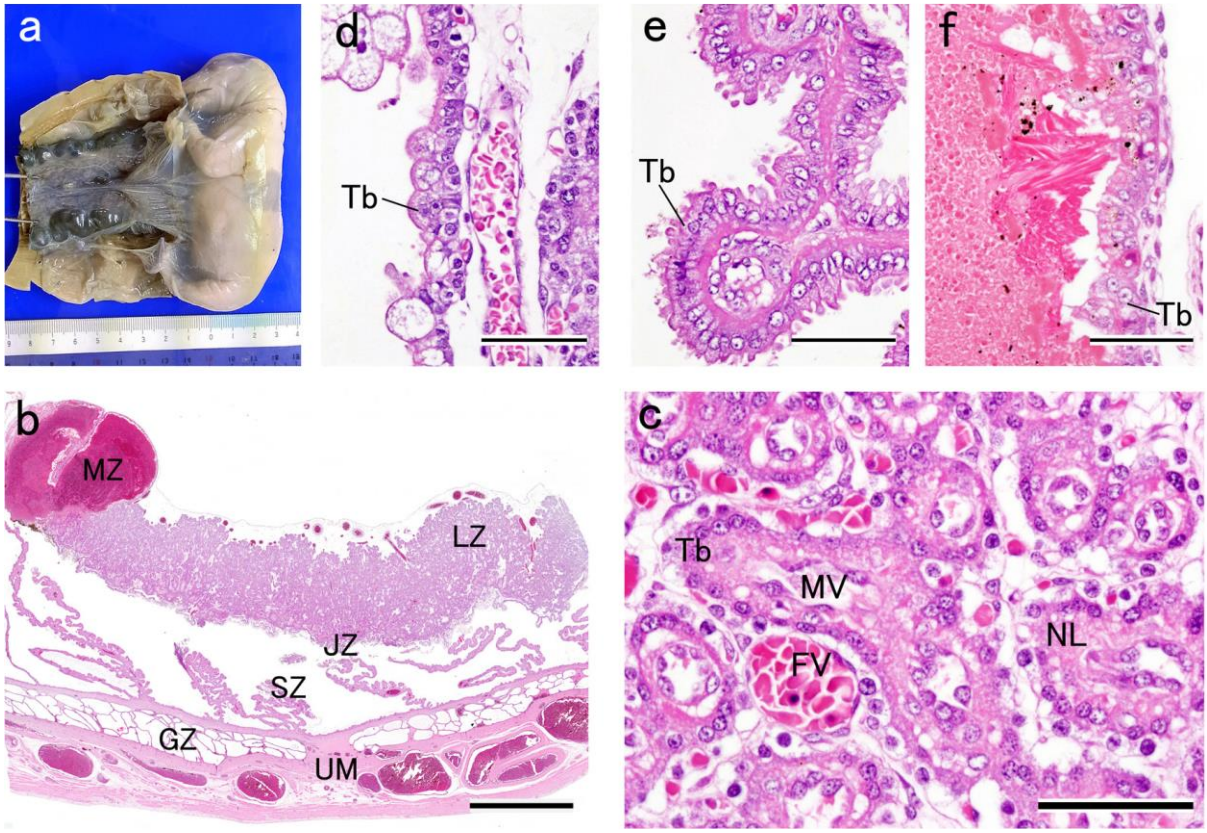

Fig. Dog placenta. Endotheliochorial type placenta. a) Gross appearance on gestation day 35. b) Histological section at low magnification. HE stain, bar=3 mm. c) Labyrinth zone. HE stain, bar=60 μm. d) Junctional zone. HE stain, bar=60 μm. e) Sponge zone. HE stain, bar=60 μm. f) Marginal hemophagous zone. HE stain, bar=60 μm. FV, fetal vessel; GZ, glandular zone; LZ, labyrinth zone; JZ, junctional zone; MV, maternal vessel; MZ, marginal hemophagous zone; NL, noncellular layer; SZ, sponge zone; Tb, trophoblast; UM, uterine muscle.

Haemochorial type:

This type is the most invasive placenta. All maternal tissue layers disappear through erosion, leading to direct connection between the chorion and maternal blood. There are hemomonochorial (primates), hemodichorial (rabbits), and hemotrichorial (rats and mice) placentas, with one, two and three trophoblast layers, respectively.

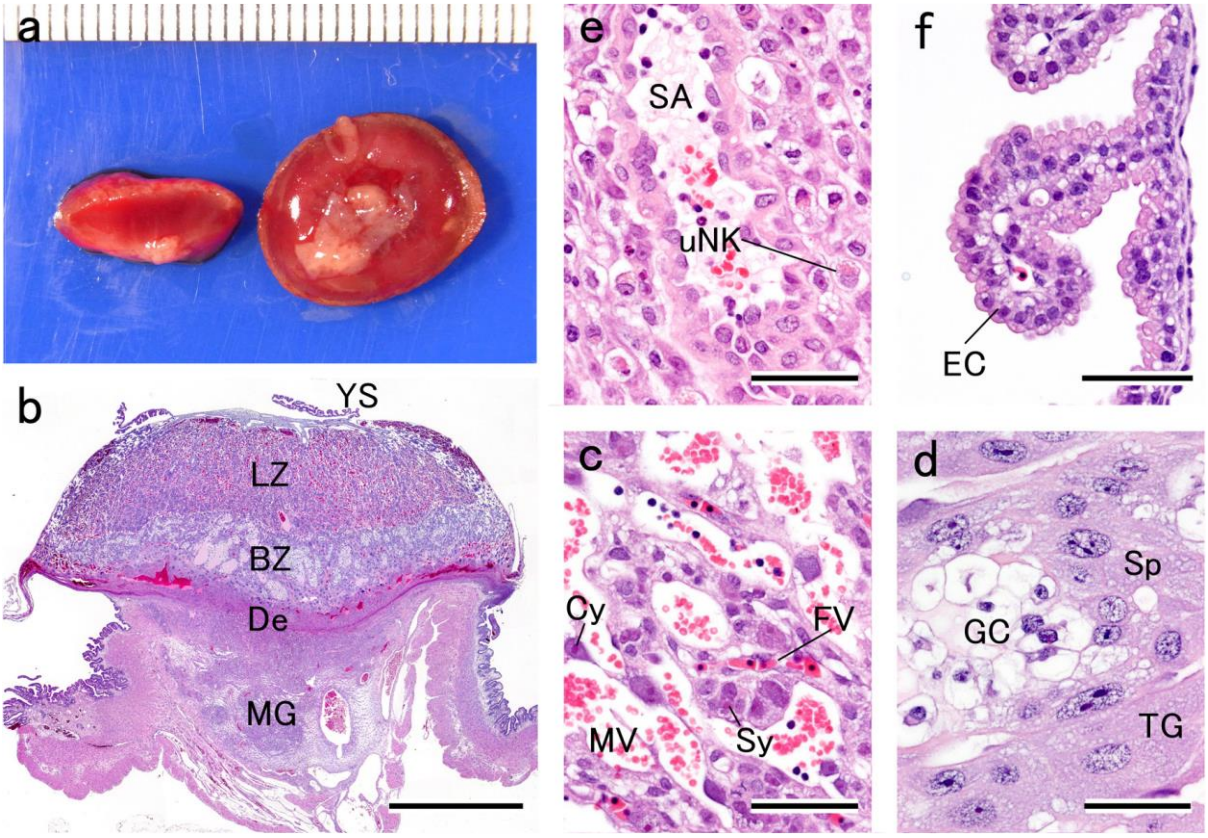

Fig. Rat placenta. Hemotrichorial type placenta. a) Gross appearance on gestation day 15. b) Histological section at low magnification. HE stain, bar=2 mm. c) Labyrinth zone. HE stain, bar=60 μm. d) Basal zone. HE stain, bar=60 μm. e) Metrial gland. HE stain, bar=60 μm. f) Yolk sac. HE stain, bar=60 μm. BZ, basal zone; Cy, cytotrophoblast; De, decidua; EC, epithelial cell; FV, fetal vessel; GC, glycogen cell; LZ, labyrinth zone; MG, metrial glands; MV, maternal vessel; SA, spiral artery; Sp, spongiotrophoblast; Sy, syncytiotrophoblast; TG, trophoblastic giant cells; uNK, uterine natural killer; YS, yolk sac.