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Autor(en) des Beitrags:
Hoenicka, M; Jacobs, VR; Niemeyer, M; Bronger, H; Schneider, KT; Kiechle, M; Huber, G; Seelbach-Göbel, B; Burkhart, J; Hammer, J; Liepsch, D; Schmid, C; Birnbaum, DE

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[Novel uses of afterbirth tissues in regenerative medicine].

Abstract:
Afterbirth tissues, which include the umbilical cord, placenta, amnion, and cord blood, are usually discarded. Recent progress in regenerative medicine suggests that we re-evaluate these tissues and assess their therapeutic potential. Firstly the unique properties of afterbirth tissues and their current use in regenerative medicine are summarised. Then we introduce the cooperation of our institutions and our experiences regarding the collection and utilisation of afterbirth tissues. A literature survey suggests that besides the well-known transplantation of hematopoietic stem cells from cord blood, afterbirth tissues were also used as a source of stem cells, progenitor cells, differentiated cells, and blood vessels for tissue engineering purposes. According to our own experience, the two participating OB/GYN departments and the blood donation service were able to organise a sufficient supply of umbilical cords for research purposes. The yield correlated with incentives for the midwives. A total of more than 4,300 cords was collected for experiments designed to create small caliber vessel grafts. The contamination rate was low. Birth mode significantly affected umbilical vein function, whereas ischaemia for up to 40 h did not have any deleterious effects. Umbilical veins were cryopreserved with a moderate loss of function. Fresh umbilical veins
were endothelium-denuded and reseeded with endothelial cells harvested from coronary artery
disease patients to generate an autologous surface. Afterbirth tissues have unique properties which
make them ideally suited for regenerative medicine. These tissues can be procured and utilised in
research facilities even in the absence of an in-house birthing centre.