

不同胎龄胎儿冠状动脉早期粥样硬化病变

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Early Changes of Coronary Atherosclerosis in Fetuses at Different Ages

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ABSTRACT We collected more than 400 fetuses at different ages. Out of them 120 cases were taken randomly whose ages ranged from 3 to 9 months. They were divided into 8 groups according to the age. Sections were made from the left and right coronary arteries where atherosclerosis occurs most commonly. All sections were stained with hematoxylin-eosin, Weigert-VG mixture, Masson's trichrome and Alcian Blue-PAS. In addition, some of them were stained with fat and mucins. The results were as follows:

1. Early changes of coronary atherosclerosis of the fetuses at different ages. ① Fat spots and fatty streaks. We believe that they can develop into atherosclerosis or stop developing or subside. ② Proliferation focuses of smooth muscle cells. Smooth muscle cells are the main elements of pathological changes of atherosclerosis, participating in the formation of atherosclerosis. ③ Smooth muscle cells can produce fibrous connective tissues and mucopolysaccharide in the walls of coronary arteries. The above mentioned findings in the fetuses are of great significance in exploring the occurrence and development of atherosclerosis.

2. I ~ II grade positive pathological changes of coronary atherosclerosis were found in the fetuses. It protruded from the media through the intima into the vascular cavities, occupying 25% or more of the

cavity. It had made the vascular cavities narrow to a degree of I ~ II grade. It is not easy to subside completely. The living conditions and environments of the fetuses are simpler than that after their birth, and these are of specific importance in studying the etiology and pathogenesis of atherosclerosis. Since the nourishment of the fetuses are supplied by the blood of the mothers' uteri, whether the early pathological changes in the coronary artery and I ~ II grade positive pathological changes of the fetuses are due to the hyperlipidemia of their mothers or the hereditary factors needs to be studied.

KEY WORDS Foetus; Coronary artery; Atherosclerosis

摘要 从收集的 400 余例胎儿中, 任取 3~9 个月余胎儿 120 例, 按月龄分为 8 个胎龄组, 分别取左、右冠状动脉组织, 常规制片观察。结果表明: ①在第 8 和第 9 个月胎龄组中, 分别有 2 例和 4 例冠状动脉壁上发现成片的泡沫细胞; ②在这两组中冠状动脉壁上还发现孤立性散在平滑肌细胞增生灶, 其中 3 例与泡沫细胞并存; ③在第 9 个月胎龄组发现冠状动脉粥样硬化早期病变、纤维斑块各 1 例。纤维斑块已使管腔狭窄 25% 左右。以上发现为胎儿的动脉粥样硬化早期变化提供了病理形态学依据。它在更新观念, 防治动脉粥样硬化的研究, 探索其病理组织发生等方面均有重要意义。

关键词 胎儿; 冠状动脉; 动脉粥样硬化

为探索冠状动脉粥样硬化病理组织发生, 从早期防治出发, 我们提出冠状动脉粥样硬化病理普查应从新生儿开始⁽¹⁾。1964 年进行尸检冠状动脉病理组织学的研究。1972 年发现幼儿冠状动脉粥样硬化一级阳性早期变化⁽²⁾。1978 年发现第一天新生儿冠状动脉左前降支的粥样硬化早期变化⁽³⁾。1983 年我们收集不同胎龄胎儿 400 余例, 从中任取第

3 到第 9 个月余的胎儿 120 例, 分成 8 个胎龄组进行组织学研究。

1 材料和方法

胎儿的心脏组织结构在 3 个月胎龄时已基本定型。因此, 我们从 10% 甲醛溶液固定的 400 余例不同胎龄胎儿中, 任取从第 3 个月到第 9 个月余的胎儿 120 例, 按胎龄月份分为 3、4、5、6、7、8、9、9+月 8 个组, 每组 15 例, 分别取左、右冠状动脉组织各一块。因第 7 和第 8 个月胎龄组胎儿心脏大小已接近新生儿, 故自第 7 组以后, 左、右冠状动脉各连续取 3 块组织, 以石蜡包埋制片, 作苏木素伊红染色, Weigert-VG 联合染色, Masson 氏三色染色, Alcian-blue-PAS 染色, 部分作类脂染色、粘液染色。

2 结果

2.1 脂斑和脂纹

在第 8 个月胎龄组 15 例中, 有 2 例冠状动脉壁上见到成片的泡沫细胞。在第 9 个月胎龄组中, 见到 4 例成片的泡沫细胞, 有的沿管壁半月形分布, 且已明显增厚, 其厚度已与中膜相等, 其形态如半月型的冠状动脉粥样硬化病变 (Fig 1, 2)^[3,4]。

2.2 平滑肌细胞增生灶

在第 8 和第 9 个月胎龄组冠状动脉壁见到平滑肌细胞增生灶 4 例, 其中 3 例与泡沫细胞并存, 平滑肌细胞可以在冠状动脉壁产生粘多糖, 它是动脉粥样硬化病变中的重要成分, 参与动脉粥样硬化的形成^[5,6]。此等平滑肌增生灶是孤立性散在分布 (Fig 3)。其形态似散在型冠状动脉粥样硬化病变。在第 8 和第 9 个月的胎儿其冠状动脉分支早已形成。因此, 此等平滑肌增生灶不是冠状动脉分支的构成部分。

2.3 冠状动脉粥样硬化早期病变

在第 9 个月胎龄组胎儿中, 在一例胎儿右总冠状动脉壁见到已凸入冠状动脉的孤立性动脉粥样硬化早期病变, 它与中膜平滑肌增生密切相关。病变由平滑肌细胞、泡沫细胞、纤维细胞、类脂样物质、个别淋巴细胞等构成, 病变表面有一层由平滑肌细胞等所覆盖 (Fig 4, 5, 6)。此病变的对侧为正常的冠状动脉。因此, 如此典型的动脉粥样硬化的早

期变化与冠状动脉的分支的组织结构是完全不同的。相反, 此一病变和兄弟单位以胆固醇所形成的动物动脉粥样硬化病变相一致。

2.4 纤维斑块

在第 9 个月胎龄组 15 例中, 在一例冠状动脉壁见到一典型的纤维斑块, 斑块以纤维细胞为主, 并有平滑肌细胞和泡沫细胞等, 这个斑块已凸入冠状动脉腔, 约占冠状动脉腔面积的 25% 左右, 它已使冠状动脉狭窄 I ~ II 级 (Fig 7, 8)。

3 讨论

本文 120 例不同胎龄胎儿冠状动脉中, 有 11 例分别见到脂斑、脂纹、平滑肌细胞增生、粥样硬化早期病变、纤维斑块等动脉粥样硬化系列病变, 为胎儿的冠状动脉粥样硬化早期变化提供了病理形态学依据。

胎儿在母体内生活的环境比出生后要单纯, 在出生后往往夹杂有其他疾病而影响冠状动脉壁的改变, 因此, 它有利于动脉粥样硬化病理组织学的研究。

胎儿的发育生长有赖于由母体的血液经胎盘供给营养, 故推论本研究所见的胎儿冠状动脉粥样硬化系列早期变化, 可能与母亲存在的可导致动脉粥样硬化的因素有关, 如高血压、高胆固醇血症、吸烟、被动吸烟、糖尿病、肥胖, 或与遗传易感性等有关。故母亲妊娠期间应重视合理的饮食、环境卫生, 防止疾病感染, 戒烟和避免被动吸烟, 治疗高血压、糖尿病等。

本研究中有冠状动脉粥样硬化早期变化的 11 例胎儿, 均分布在第 8 和第 9 个月胎龄组, 这是值得进一步探讨的。

8 个月胎龄胎儿冠状动脉的组织学结构, 已接近新生儿 (Fig 1)。

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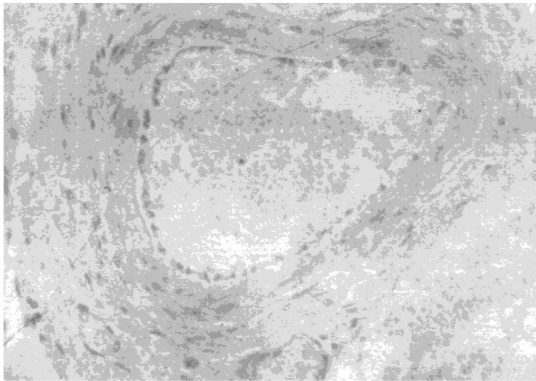


Fig 1. The histological structure of the right coronary artery in fetus at the age of 8 months (20×).

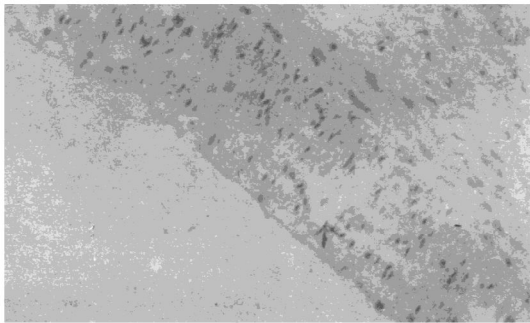


Fig.2. There are foam cells in the wall of the left coronary artery of fetus at the age of 8 months. The thickness of the tunica intima of coronary artery has started to increase (4×).

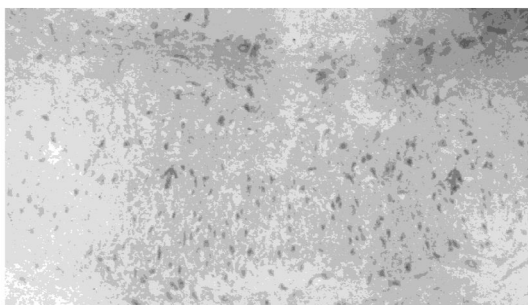


Fig 3. Foam cells are distributed as semicircularly in the wall of the right coronary artery of fetus at the age of 9 months. The thickness of the tunica intima has obviously increased (40 \times).

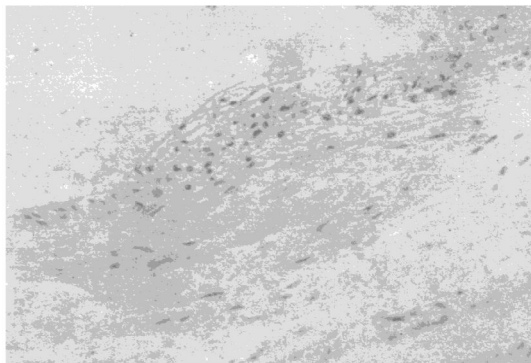


Fig 4. There are proliferous foci of smooth muscle cells in the wall of the right coronary artery of fetus at the age of 8 months. The smooth muscle cells proliferate in the media and tunica externa (4 \times).

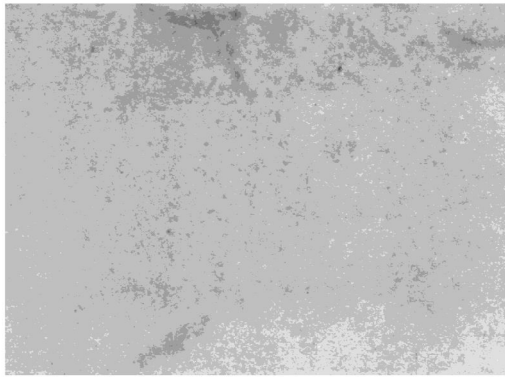


Fig 5. There is atherosclerotic focus in the right coronary artery of fetus at 9 months (20×).

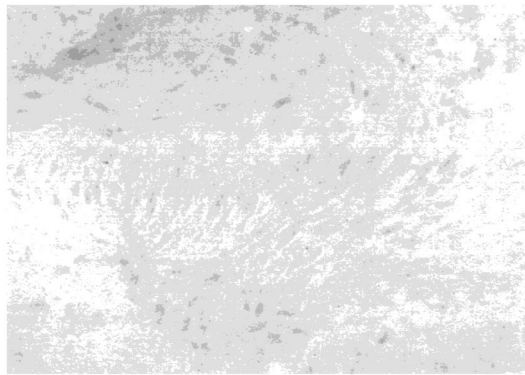


Fig 6. It is indicated that early atherosclerotic focuses are closely associated with the proliferation of the smooth muscle cells in the media (40×).



Fig 7. There are the atherosclerotic fibred spots in the left-front-lower branch of the coronary artery of fetus at the age of 9 months. It showed 1 grade positive pathological change that protruded from the media through intima into the vascular cavity, which occupying 25% or more of the cavity (10 \times).



Fig 8. The atherosclerotic spots were composed of smooth muscle cells and fibrous connective tissue and some foam cells that protruded from media through intima into the vascular cavity (20 \times).