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Typical and variant anatomy of the palmar arteries during perinatal period of ontogenesis

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Abstract

Background: The value of the study is finding typical and variant anatomy of the palmar arteries during fetal and early neonatal periods of ontogenesis, which is important while performing amputations, osteosynthesis, resection of bones followed by further prosthetics, as well as during catheterization of the arterial branches in order to deliver diagnostic and therapeutic substances in fetuses, neonates and infants.

Material and methods: The study was performed on 51 specimens of dead fetuses (from 4 to 10 months) and 10 neonates of both sexes died due to the causes not related to diseases of the muscular-skeletal system and without external signs of anatomical defects, without visual macroscopic deviations or anomalies from the normal structure of the upper limbs.

Results: During the perinatal period of ontogenesis the typical anatomy of the palmar arteries (formation of the superficial palm arch) is found in 62% of cases, the variant one – in 38%. The variant structure of the palmar artery during the perinatal period of ontogenesis is divided into closed and open-ended (continuous superficial palmar arch is absent) arteries. In their turn, closed palmar arteries include anastomosis formation in the form of an arch and without arch formation. In case of open-ended arteries the palm is supplied with blood through the branches from two or three arteries. The older the fetus is, the greater percentage ratio of the typical structure of the palmar artery becomes (9% of cases more) in comparison with other forms. Moreover, the open-ended artery system increases when the palmar surface is supplied with blood from the three arteries (28% of observations more) in comparison with those cases when the palmar surface is supplied through the two arteries. During the perinatal period of ontogenesis the amount of the variant arterial structure is more found on the left palm (25%) compared to the right one (17.5%).

Conclusions: Detection of the typical and variant anatomy of the palmar arteries is a morphological precondition to introduce new methods of performing radical and reconstructive-restorative surgeries on the hand.

Key words: arteries, palm, anatomy, fetus, neonate.

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