7. MORPHOLOGICAL FEATURES OF THE UMBILICAL ARTERY IN NORMAL PREGNANCY AND PREECLAMPSIA

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Introduction. The vascular component of the umbilical cord is represented by two umbilical arteries and one corresponding vein. The characteristic structure of the umbilical arteries makes them highly vulnerable to any structural deviations. Therefore, the morphological state of these vessels is considered a crucial indicator of fetal status. Preeclampsia is a systemic vascular condition that typically manifests after the 20th week of gestation.

Aim of study. This study aimed to identify the distinct characteristics of the umbilical artery in normal pregnancies and preeclampsia, with an understanding of the pathological mechanisms involved in preeclampsia.

Methods and materials. The study was conducted based on retrospective reviews, various scientific data, and specialized articles obtained through search engines such as PubMed, Google Scholar, ScienceDirect, and IBN.

Results. The umbilical artery is a medium-sized muscular artery characterized by an irregularly contoured lumen and walls composed of two distinct layers: intima and media. The intima is the innermost layer of the vessel, much thicker compared to the umbilical vein. It is composed of endothelium and a reduced subendothelial space. Small-sized smooth muscle cells arranged perpendicularly to the endothelial basement membrane were also identified. The media layer contains bundles of smooth muscle cells arranged in two distinct layers. In conditions of preeclampsia, systemic endothelial dysfunction is observed, manifested by increased vascular permeability and fluid accumulation between smooth muscle cells of the media with the expansion of intercellular spaces. The arterial wall significantly increases in size, approximately by 20%, due to interstitial edema plus an increase in the intima and media layers, caused by the migration of smooth muscle cells toward the endothelium. These changes contribute to the narrowing of the arterial lumen.

Conclusion. The umbilical artery in pregnancies complicated by preeclampsia exhibits significant morphological changes. These alterations impact the supply of blood and nutrients to the fetus, resulting in hypoxia and impaired growth.