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Clinico-morphological aspects and outcomes of the lean umbilical cord

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Abstract

Background: The umbilical cord forms connecting link between the fetus and placenta through which the fetal blood flows to and from the placenta. Wharton's jelly is a specialized tissue which acts as supportive and protective structure substituting for the adventitia of the umbilical vessels. The aim of the study was to reveal the clinical and morphological features of the lean umbilical cord for improving its outcomes.

Material and methods: The study included 190 patients divided into 2 groups: L₁ – 95 patients with UC abnormalities and L₀ – 95 with normal UC. Umbilical cord assessment was based on macro- and microscopic examinations. An entire umbilical cord was available from all patients and examined for diameter. Three full thickness sections of the UC were fixed in 10% formalin and stained with hematoxylin and eosin, Van Gieson's, Alcian blue for histological examination.

Results: A study of the association between the absence of Wharton's jelly and an unfavorable pregnancy outcome was undertaken. The lean umbilical cord results in reduced fetoplacental circulation, thus resulting in intrauterine growth restriction ($p < 0.0001$), fetal distress and hypoxia, which require the neonatal intensive care ($p < 0.0001$). Morphological examination of the umbilical cord revealed changes in Wharton's hard and fibrous jelly.

Conclusions: This study shows the importance of the knowledge of cord diameter. Clinico-morphological examination of the umbilical cord, including the study of the lean forms is of great importance in the diagnosis of the causes of adverse perinatal outcomes of fetuses and newborns in the obstetrical practice. Therefore, our study confirms that all umbilical cords should be submitted for complete examination.

Key words: lean umbilical cord, Wharton's jelly, diameter, morphology, perinatal outcome.

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