

Editorial on Umbilical Cord

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INTRODUCTION

The umbilical cord (also known as the navel loop, birth cord, or funiculus umbilicalis) connects the developing embryo or foetus to the placenta in placental mammals. The umbilical cord is physiologically and genetically a part of the foetus during embryonic development and usually comprises two arteries and one vein buried within Wharton's jelly in humans. The placenta provides oxygenated, nutrient-rich blood to the foetus through the umbilical vein. The foetal heart, on the other hand, pumps low-oxygen, nutrient-depleted blood back to the placenta through the umbilical arteries.

Causes

The yolk sac and allantois grow into the umbilical cord, which includes their remnants. By the fifth week of development, it has evolved and has taken the place of the yolk sac as the embryo's source of nutrients. The cord does not connect directly to the mother's circulatory system; rather, it connects to the placenta, which transports materials to and from the maternal blood without allowing direct mixing. Mesenchymal and epithelial stem cells can be found in the umbilical cord lining. Clinical trials have used umbilical cord mesenchymal stem cells to treat osteoarthritis, autoimmune disorders, and a variety of other ailments. Their benefits include improved harvesting and multiplication, as well as immunosuppressive properties that limit their use in transplants. Wharton's jelly is a gelatinous material made primarily of mucopolysaccharides that protects the blood vessels within the umbilical cord. It has one vein that transports oxygenated, nutrient-rich blood to the fetus and two arteries that transport deoxygenated, nutrient-depleted blood away from the fetus.

Connection to fetal circulatory system

The umbilical cord reaches the foetus from the belly, at the site

of the umbilicus. The umbilical vein in the foetus proceeds to the liver's transverse fissure, where it breaks in two. The hepatic portal vein, which carries blood into the liver, is connected to one of these branches. The second branch runs into the inferior vena cava, bypassing the liver which carries blood to the heart.

Problems and abnormalities

A variety of anomalies can affect the umbilical cord, causing complications for both the mother and the infant.

Entanglement of the cord, a knot in the cord, or a nuchal cord (the wrapping of the umbilical cord around the foetal neck) may cause umbilical cord compression, although these conditions do not always cause foetal circulation obstruction.

- Velamentous cord insertion
- Single umbilical artery
- Umbilical cord prolapse
- Vasa praevia

The umbilical cord in other animals

In certain mammals, such as cattle and sheep, the umbilical cord has two separate umbilical veins. In the human umbilical cord, there is just one umbilical vein. The mother will gnaw through the cord in certain species, separating the placenta from the offspring.

The mother also eats the cord and placenta to provide nourishment and to eliminate tissues that may otherwise attract scavengers or predators. Hammerhead sharks, requiem sharks, and smooth-hound sharks are viviparous, meaning they have an umbilical cord attached to their placenta. Animals that lay eggs tend to have a false umbilical cord that connects the embryo and yolk in a similar way to humans.

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