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Umbilical cord anatomy and physiology pdf

During pregnancy, the umbilical cord is formed as a link between mother and child to provide the fetus with everything it needs to grow. Immediately after birth, the umbilical cord provides one more chance to give life. Here we look at the science of cord functions. The physiology of the umbilical cord in the full range, the umbilical cord is about half a meter long, a length that allows the child to move safely. It consists of two small arteries and one larger vein. Arteries transport blood from the fetus to the placenta, while the vein transmits blood from the placenta to the fetus. At birth, the umbilical cord is cut and the remaining part is the belly button. The physiology of the umbilical cord placenta binds the baby's abdomen from the placenta, which in turn is connected to the mother's uterus. The placenta is responsible for the production of pregnancy hormones, as well as hosting important food exchanges between the mother and the baby's blood supply. Small blood vessels carry fetal blood through the placenta, which is filled with the mother's blood. Food and oxygen are passed from the mother's blood to the fetal blood and the waste is passed back to the mother's blood - all without any mixing of the two blood supply. After birth, the placenta is separated from the uterus and expelled. Umbilical cord blood after the birth of the baby and cut the umbilical cord, there are blood residues in the umbilical cord and placenta. The baby no longer needs this extra blood that contains umbilical cord blood on all the natural elements of blood, but it is also rich in stem cells similar to those found in the bone marrow. Stem cells for cord blood can be used to treat more than 80 different diseases, with many diseases in the research stages. There is a small chance of a chance at birth to collect umbilical cord blood. The blood of the umbilical cord collected by refrigeration is frozen and stored in the family umbilical cord blood bank. If a direct family member needs stem cells for treatment, there is a good chance that the blood of the cord stored will be identical. Cord blood can also be donated to a public bank. Tags: Umbilical cord blood umbilical cord blood banking umbilical cord blood placenta understanding umbilical cord is considered umbilical cord both physical and emotional attachment between mother and fetus. This structure allows the transfer of oxygen and nutrients from the maternal circulation in fetal circulation while simultaneously removing waste from fetal rotation until the mother is eliminated. On the other hand, mothers have an emotional relationship with the fetus through the cord. It may be worth considering the path of love and care during pregnancy. Thus, some poets call it the life series. Umbilical cord is a bundle of blood vessels that develop during the early stages of shrimp development. It is surrounded inside the tubular sheath of amniotics and consists of two secret arteries associated with a single vein navel. During development, secret arteries Vital function to carry doxygenide blood away from the fetus to the placenta. [1] However, after birth, a large part of the umbilical artery decomposes. These remains later obliterate, forming a central umbilical ligament. [2] At the same time, the near part of each navel artery serves as a branching point for the development of the anterior anterior iliac arteries. The inner iliac arteries later lead to superior containive arteries that supply the urinary bladder and ureter as well as duct vases and seminal vesicles in males. [3] The umbilical cord is a biostructure throughout the development period as it binds the fetus to the placenta and the uterine wall while also acting as an essential way to enable blood to circulate between the fetus and the placenta. [5] Anatomical features of the umbilical cord umbilical cord is a soft, twisted cord with a soft outer cover of henion. It extends from the embryo umbilicus to the center of the placenta. It is 50 cm long and 60 cm long and about 1 cm in diameter. [6] The umbilical cord consists of a gel floor material in wharton or semi-acathane gelatina. It consists of mucous electrons from the pairing of hyaluronic acid and chondroitin sulfate. As mentioned earlier, three vessels include the umbilical cord: two secret arteries and one secret vein. [7] The orchus are fibrous remnants of the public to extend through the secret cord and are located in the space Rituz between the Breton Inari and the occasional frontal sparkling at some point. Orajos acts as a drainage channel for the urinary bladder of the fetus. [8] FunctionThe secret arteries carry blood other than oxide from fetal circulation to the placenta. The two secret arteries converge together about 5 mm from the insertion of the cord, forming a type of vascular connection called the colony in Hartle. [9] The primary function of Hartle's ablation disease is to achieve equal blood flow and pressure between the secret arteries and the placenta. [10] When arteries enter the placenta, all ramifications are released into smaller branches called choroid vessels. During the early stages of fetal development, the use of gas occurs and distinguishes bacterial tissues into three distinct layers: external ectoderm, intrafetal mesomirm, and internal endoderm. [11] The formation of the umbilical cord occurs in three stages and coincides with the glazing process. 1. The formation of the primal navel ring occurs this growth phase along with the folding of the embryonic disc. During this phase, the embryonic disc swells into the amniotic cavity as a result of folding. At the same time, the intersection of amino-etopermal, which is the tight connection between fetal security and the ectodermal layer, becomes the abdominal side of the Then, the reflection line between the amnidays and ectoderm acquires an oval chart called ring.11 primal navel. The formation of the primitive secret cordy this stage of development begins in the fifth week of pregnancy, during which the primitive secret ring digs to form a tubular sheath. The tubular sheath is called the primary umbilical cord. It attaches the body leg, the yolk bag, and its parents, well as it is. The final umbilical cord formation during this phase, the umbilical cord is lengthened, and its infrastructure is subject to initial changes. For example, the unkempt messour from the body's leg begins to differentiate into a screwdriver called Wharton gel. Wharton gel develops gradually and forms the bulk of the umbilical cord. The remnants of the extrauterine marrow in the umbilical cord gradually deteriorate. The yolk bag becomes a blur along with vitello's intestinal canal which connects the yolk bag with the middle. Similarly, the part of the nucleus becomes embedded. However, the Lanok ships continue to lengthen the formation of clandestine vessels. Finally, during the sixth week, part of the mid-umbilical cord loop enters the development of physiological hernia. This physiological hernia is usually corrected when this part of the mid-mid to the abdominal cavity returns after the tenth week of pregnancy. [12] The umbilical cord, along with the placenta, contributes to the flow and regulation of fetal circulation. The umbilical arteries originate from the inner iliac arteries of the fetus and enter the umbilical cord before branching out further at the placental level. At the placental level, each nudist artery branched into smaller arteries that continue to branch out more to distribute blood to the placental fuz. Capillaries of the fumin of funm sympers to form venules that converge to form a secret vein. The secret vein carries oxygenated blood and nutrients from the mother to the fetus. [13] As the fetus develops, both menstrual circulation and secret circulation gradually develop, until maturity is completed at the end of the first trimester of pregnancy. In the middle of a station, the secret blood rate in the fetal blood circulation is about 30% of fetal heart output. During the last three months of pregnancy, the flow of secret blood decreases significantly because it becomes proportional to the fetal weight measured in kilograms. This proportion has been significantly reduced over the last three months to less than 20 per cent. The secret vein enters the abdominal area of the fetus. It carries oxygenated blood with nutrients to fetal liver cancer and dinos. Then, blood flows into the lower kava vein and oval ripper from the heart of the fetus. [14] On the other hand, the role and distribution of the lymphatic drainage of the placenta, as well as the umbilical cord, was rarely in scientific resources. However, recent research has shown D2-40 expression at the stromal placenta level has a vital role in fetal lymphatic drainage. This expression is associated with the cells expressing budolulin, whose function is associated with the formation of a lymph-like network. The thinking is that those cells are responsible for providing lymphatic drainage of the umbilical cord and placenta. [15] The umbilical cord lacks the inherent and refractive inner alleles throughout all stages of fetal development. Vascular substances secreted locally within the wall of secret vessels or that are carried out through fetal circulation are responsible for regulating smooth muscle tension within the secret blood vessels. For example, nitrous oxide and prostacyclin play an essential role in maintaining low blood vessel resistance within the secret blood circulation and placenta. Furthermore, catecholamines are the main contributor to the expansion of vessels of clandestine vessels immediately after participation. [16] The bulk of the umbilical cord is made up of Wharton gel because it does not have any voluntary skeletal muscles. However, the secret blood vessels have several smooth muscle layers of different compositions and thickness. The walls of secret ships consist mainly of three layers: tunica tunica, tunica media, and tunica interna. Tunica externaAlso referred to as tunica adventitia, it is the outer layer of navel vessels that consist of fibrous connective tissue and elastic in varying amounts of collagen and elastic fibers. The connective tissue of this layer is very dense near tunica media. It moves to loose connective tissue because it extends towards the ends of the secret vessels. The secret arteries have the most dense connective tissue in the tunica externa compared to the secret vein. [17] Tunica mediaTh this section is the middle class within the wall of secret vessels. It represents the bulk of the muscle vessels and consists mainly of smooth muscles. It provides structural support for ships. It is also responsible for changing the diameter of secret vessels. Thus, it contributes primarily to the regulation of blood flow and blood pressure. The thicker layer is usually inside the wall of blood vessels. It is thicker in the secret arteries than the secret vein. Furthermore, tonica means of secret arteries contain well-defined internal and external rubber membranes that may be less specific or not present in the secret vein wall. [18] Tunica internaAlso called temba tunica, is the deepest layer of secret blood vessels. It consists of a simple squamous epithelium resting on the basement membrane consisting of connective tissue rich in elastic fibers. These layers together form the lining of the secret vessels. The secret vein of tonica contains valves that direct blood flow in one direction and prevent a reduction in the other. These valves are absent in the wall of the secret arteries. [19] The umbilical cord's winding patterns one of the most common morphological variations of the umbilical cord is the various helipmic winding patterns. The degree of winding is measured by the umbilical cord index (UCI). Normally, the umbilical cord winding pattern has a UCI 0.2 coils/cm. The most common style rope model is considered to be a umbilical cord winding. On the other hand, hyperplasia of the umbilical cord is defined as having uci greater than 0.3 coils/cm and a relatively high percentage of about 6% to 21% of all pregnancies. [20] Also, umbilical cord coils can be in a wavy pattern that has a relatively high percentage compared to other winding patterns, such as fragmented or tied coils of the umbilical cord. It has been clinically found that abnormal winding of the umbilical cord is closely associated with the blockage of fetal blood vessels, which in their role can eventually lead to fetal thrombosis, avaazy fuz or organic vemiotry butter jars that usually occur with a fragmented winding pattern of the umbilical cord.[21] The false knot of the umbilical cord node are swollen lumps located on the surface of the umbilical cord. Sometimes, overwisting the umbilical cord inside the uterus can cause these bulge lumps to show a knot on the uterine ultrasound blatantly. The appearance of a node of this condition forms across the excessive accumulation of large amounts of Wharton jelly alternating with areas with a relatively lower amount of gel compose sycing after each bulge. Thus, it was identified as a false knot of umbilical cord. This physiological difference does not affect the stability of the fetal position, nor does it affect the flow of secret blood and pressure. Thus, the pseudo-nodes do not represent a significant risk to the fetus. [22] One navel artery occurs as one navel artery is generally very low. However, it is known to be more common in multiracial females compared to empty ones. Many studies have reported that the left umbilical artery is more often absent from the right. [23] The absence of a secret artery is of very little importance, except that one study concluded that infants with one naked artery identified by ultrasound in the uterus reported congenital abnormalities, including heart, kidney, intestinal and skeletal abnormalities when the left umbilical artery was absent. [23] [25] [26] [26] [27] Urinary tract infections were also observed to be higher in infants with a single artery of the navel. [28] Considerations of theoretical anesthesia and secret blood flow effect of fetal oxygen delivery. Myometrial tone and mother's blood pressure have a direct relationship with uterine artery blood flow. Volatile anesthesia usually reduces myometrial tone and tends to lower maternal blood pressure. Later, there is a decrease in fetal oxygen due to a decrease Placenta blood flow. The maintenance of patented secret arteries and the basis of maternal arterial blood pressure is necessary to keep the heart out of the fetus. For example, maternal hyperplasia leads to fetal oxidative stress deficiency as a result of reducing secret venous flow. Similarly, maternal deficiency should be avoided during all maternal or fetal procedures as it is directly related to fetal hypoxia. Thus, inhalation anesthesia is the best option for fetal and intrauterine procedures. Furthermore, epidural anesthesia plays a crucial role in the prevention of early labor during the postoperative period of the mother's surgeries. [29] Giving vein/catheterisation is considered the main location of the handcuffing. The secret vein remains open for about a week after labor and can be useful in giving fluids and intravenous medications to newborns who need more aggressive resuscitation efforts. The secret vein has a larger lumen than the secret arteries due to thinner means of tonica - catheter through the secret vein to the Venus canal. Finally, the catheter reaches the lower vein below the right atrium. [30] Furthermore, secret arterial lines can also be used in recovery efforts during the first week after birth. Secret arterial catheterization is routinely used for direct access to arterial blood gas monitoring, arterial blood pressure and vascular imaging. In neonatal intensive care, a secret arterial catheter is usually used to provide blood samples for laboratory tests. [31] Different types of cord deformities can be fatal or pose a serious threat to fetal health. Thus, it is of great clinical importance to have early detection of these abnormalities to be able to provide a proper diagnosis and care plan. Philimonus incorporated the occurrence of insertion velamentous umbilical cord significantly elevated for invitl fertilization (IVF) pregnancy caused by comparing normal pregnancy pregnancy. This occurs in about 10% of pregnancies and 20% of pregnancies in IVF. [32] The intravenous insertion of the umbilical cord occurs when the end of the placenta consists of the umbilical cord of the secret arteries and the vein surrounded by fetal membranes without Wharton gel. The exact cause of this situation remains unclear. However, the most current hypothesis suggests that during the IVF pregnancy, half of the placenta is over-spreading, making the umbilical cord insertion site move marginally away from its center. Conversely, the other pole of the placenta becomes unable to follow placental migration. This condition poses a risk to the fetus during childbirth. [33] The anatomy of the umbilical cord consists of four vessels of three vessels represented by the arteries of a single den and vein. It depends Pregnancy week, usually erases the right secret vein, leaving one (left) and red navel patent. However, cases of secret cords containing four vessels have been documented. The persistence of two secret veins and two nudist arteries within the umbilical cord is associated with multiple abnormalities in the heart, blood vessels and digestive system. [34] When the left and left secret veins remain open, a condition called the continuous right secret vein (PRUV) is called. This condition is usually caused by folic acid deficiency during the first trimester of pregnancy. This condition may cause severe effects on the fetus and act as a risk factor for its overall physical health. [35] The true knot of umbilical cord densities are true interlocking nodules for secret vessels along the umbilical cord. It usually occurs early in pregnancy as a result of various pre-existing factors. Most commonly, the development of a real node is associated with the presence of excessive amniotic fluid, causing high pressure on the umbilical cord vessels, increasing their twisting strength, causing the deep knot to those vessels. Also, an increase in fetal movement in the uterus plays a vital role in creating this mutant deformity as umbilical cord supercoils can cause a knot on itself. Real umbilical cord deformities are very serious because they may obstruct blood flow in the secret vessels, which may eventually lead to fetal demise. [36] The very short cord is the Cordan umbilical cord remarkably short when it is approximately 40 cm long. A short umbilical cord can lead to early separation from the placenta leading to interruption suppository of the fetus and, as a result, intrauterine bleeding followed by fetal death. [37] Cordelial is very long although the umbilical cord is longer than 65 to 70 cm long and is clinically considered long. The abnormally long umbilical cord has more potential winds around the fetal neck several times that contribute to fetal death, or may also emerge from the mother's cervix. [37] OmphalocoeleAlAlso is referred to as exomphalos, an abdominal wall defect that causes herniated intestines and sometimes other organs in the umbilical cord. The pathological physiology behind this condition is due to the failure to reduce the physiological secret hernia. [38] Surgical correction of such conditions is considered to prevent intestinal obstruction of newborns. An abnormal attachment of the umbilical cord of the placentatimes, the umbilical cord may have an abnormal attachment location on the placenta. For example, the umbilical cord may hang heavily on the placenta outside the center, resulting in an eccentric elbow deformity. The placenta may take a deformed form called the placenta periodic battle. This deformity is caused by the marginal attachment of the secret wire to the placenta. [39] It is closely related to Hyperplasia of the umbilical cord in most cases. Delayed separation of the umbilical cord diseparationseparation! what the umbilical cord can occur at any time after birth with no reliable fixed schedule. However, in general, separation of the umbilical cord is considered late if it occurs after the first three weeks after birth. There are many factors and pathological conditions associated with delayed cord separation. For example, the topical application of antibiotics, alcohol and triglycerides after birth has a significant contribution to delaying cord separation. Moreover, pathological conditions such as infection, immune disorders, and the presence of Urachal residue can also delay the separation of the umbilical cord. Interestingly, the researchers found a relationship between each reduction in birth weight, caesarean section, prematurity and an increased risk of delayed cord separation. It is clinically important to consider more workup in newborns with delayed separation of umbilical cord and skin infections or those that decompose the remains of fixed orasal. These infants most likely have an underlying immune disorder. [40] Secret abscesses are classified into two main categories: real cysts and pseudo-cysts. It usually occurs near or about the introduction of the cord into the fetus umbilicus. Umbilical cord cysts usually develop during the first trimester with standard accuracy by the end of the twelfth week of pregnancy. Secret abscesses have 3.4% of all pregnancies. The exact etiology of secret cysts is not clinically defined. However, they appear to be closely related to chromosomal abnormalities, including trisomyof chromosomes of chromosomes 13 and 18, imperforate, and amyloidosis tumor in the cord. [41] The most common type of cyst is pseudocyst. It is also known to be pseudo-cysts in wharton gel. It lacks epithelial tissue and usually occurs as a result of the epithelial edema of wharton gel. Also, they can develop as a result of mucoid degeneration within the cord. It is not uncommon to see single cysts or multiple focal lesions. The diameter of these lesions is approximately 2 cm. On the contrary, real cysts of the umbilical cord usually develop from the omphalomesenteric canal or other primitive embryonic structures, including allantois. Real cysts have a distinct epithelial lining: They are therefore known as real cysts. [42] In general, secret bags are of clinical importance. It serves as an early indicator of chromosomal abnormalities, especially if cysts persist during the second and third trimesters of pregnancy. Thus, carnivorous disorders and amniocentesis are useful diagnostic procedures to determine any underlying conditions associated with them. Granulomaena is a red dogma that may develop after the separation of the umbilical cord from the newborn sea. On average, the diameter of the granuloma is about 5 mm. [40] From this lesion involves the abnormal spread of fibroblasts in umbilicus forming thick layers of granulocytes and permphilia. The vessels closed inside the lesion have a dotted or strawberry-like appearance. [43] The mainstay of the treatment is chemical ironing with silver nitrate. More caution is needed to avoid injury or chemical burns to the surrounding skin. However, it is of great clinical importance to provide further evaluation of persistent navel granulators as they can be mistaken for polyps that may require surgical removal. Continuing Education / Review questions for fetal membrane and placenta clinical development, diagram shows a later stage in the development of umbilical cord, placenta fuz, umbilical cord, alatao, heart, fetus. Contributed by gray anatomy boards the development of fetal membranes and placenta, the fetus in the uterus; Between the fifth and sixth months, umbilical cord, Cervix uteri. He contributed to gray anatomy panels subregion, embryo of about six weeks, umbilical cord, embryology. Contributed by Grey's Umbilical Cord Anatomy Paintings. Photo courtesy Of Bhini] MD 1.Barríos-Arpi LM, Rodríguez Gutiérrez JL, López Torres B. Characterization of the histology of the umbilical cord in alpaca (Vicujina Bacchus). Fetal Hytul. 2017 Dec;46(6):533-538. [PubMed: 28884482] 2.Tokar B, Yucel F. Anatomical differences of the median umbilical ligament: clinical importance in laparoscopic exploration for children. Pediatr Surg Int. 2009 Dec;25(12):1077-80. [PubMed: 19727772] 3.Mamattha H, Himlatha B, Vinodini P, Souza AS, Suhani S. An anatomical study on differences in the branching pattern of the internal anlico artery. Indian J Surg. 2015 Dec;77 (Suppl 2):248-52. [PMC Free Article: PMC4692843] [PubMed: 26730003] 4.Hooper SB, Polglase GR, T-Bas AB. Physiological approach to the timing of cord clamping at birth. Arc Des baby newborn Ed. 2015 Jul;100(4):F355-60. 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