Developmental defects of the body wall

'*Developmental defects of the body wall* often lead to disorders of the organs stored in the body cavities. The cause of the disorders is usually the failure of the embryo in the formation of head and tail bending and twisting in the transverse plane. Development is disturbed if the folds do not reach the umbilical region (the exception is the umbilical hernia).

Formation of the intraembryonic cavity

The **Intraembryonic Cavity** begins to form already in the third week of development, when the intraembryonic mesoderm divides into the paraaxial and intermediate regions and the lateral plate. The intercellular spaces in the lateral plate enlarge until they merge into larger spaces and thus divide the lateral plate into the somatopleure (layer of the body wall) and the splanchnopleure (the visceral layer). An intraembryonic body cavity forms between the layers. The visceral layer is located at the wall of the yolk sac. The connection between the two halves of the intraembryonic cavity and the extraembryonic cavity disappears at the time when the embryo begins to bend (craniocaudal axis, transverse plane) and one extensive intraembryonic cavity is formed extending from the thorax to the pelvis.

Cleft sternum

During development, the mesoderm ridges, which are the basis of the], do not fuse together sternum.

Ectopia cordis

Ectopia cordis is a defect in which the heart has prolapsed and found itself outside the body cavity. The heart can be stored outside the body wall only under the skin, or completely outside the chest wall, when it is covered only by a thin membrane. The reason for the protrusion is that both sternal bars are not fused or the absence of their lower third.

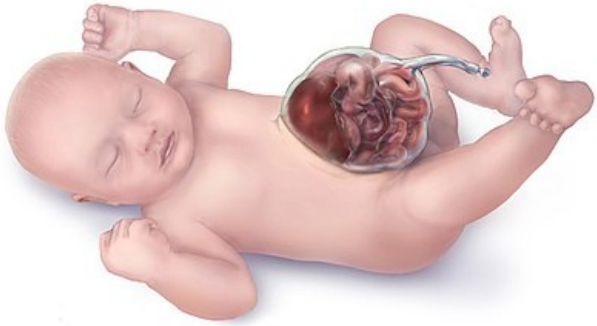
This is a very rare and serious defect. The prognosis for survival is approximately 10%. Surviving newborns require extensive surgery and lifelong medical care.

Cantrell Pentalogy

Pentalogy of Cantrell is a collection of several birth defects, including omphalocele, cleft sternum, ectopia cordis, hernia in the anterior part of the diaphragm, and some congenital heart defects (e.g., tetralogy of Fallot, ventricular septal defect).

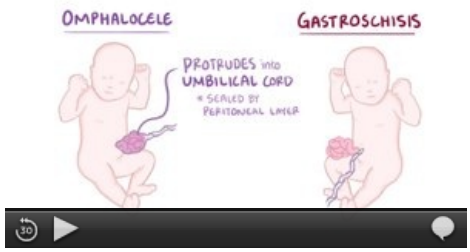
This is a very rare and serious defect occurring in about 6 out of 1 million newborns. Most individuals are stillborn or die after birth. This defect is treated with surgery, but with a high risk of death or permanent consequences.

Omphalocele



'*Omphalocele* is a congenital developmental defect occurring between the sixth and tenth week of development, when the physiological hernia does not retract. Abdominal organs covered by the umbilical cord (liver, stomach, spleen, bladder, large and small intestine) protrude from the abdominal cavity.

This defect occurs on average in one to two newborns per ten thousand births. The mortality rate is around 25%. Surviving newborns may suffer from cardiac anomalies (50%), neural tube defects (40%), and about 15% have chromosomal abnormalities. This defect can be detected by ultrasound during pregnancy and is treated surgically after delivery.



Omphalocele (video).

Gastroschisis

preview

Gastroschisis or *laparoschisis* is a developmental defect in which the closure of the abdominal wall (small and large intestine) is disrupted and the abdominal organs protrude into the amniotic cavity. It usually occurs on the right side next to the navel. Organs are not covered by amnioma or parietal peritoneum (possible fluid damage).

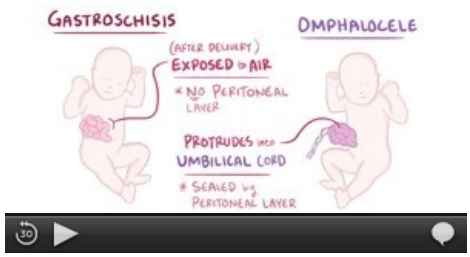
It occurs in one to two out of ten thousand newborns. This defect is usually not accompanied by other serious defects or chromosomal abnormalities. However, knotting of the intestine and subsequent damage to the vascular supply, death of the intestine and subsequent death of the fetus can occur. The defect is usually detected during

an ultrasound examination in the second trimester of pregnancy (obvious opening and protruding insides). This defect is treated surgically and currently the survival rate is high (Motol Hospital up to 90%).

Exstrophy of bladder and cloaca

'*Exstrophy of the bladder and cloaca* is a defect caused by non-closure of the body wall in the pelvic area. Protrusion of the bladder occurs on the surface of the embryo and, in more serious cases, prolapse of the cloaca (rectum).

This defect is solved surgically after birth. However, there is a risk of permanent consequences such as urinary incontinence and sexual dysfunction (especially in boys).



Gastroschisis (video).

Links

Related Articles

- Cleft defects

External links

- CHOWDHARY, Sunita. *Ectopia Cordis*. Medindia [online]. India, 2017 [cit. 2018-12-31]. Available from: https://www.medindia.net/patientinfo/ectopia-cordis.htm#1
- KALOUSOVA. *About gastroschisis - through the eyes of a surgeon and ICU doctors*. Gastroschisis [online]. CR, 2011 [cit. 2019-01-05]. Available from: http://www.gastroschiza.cz/?module=dokument&action=display_dokument&id=7

References

- SADLER, Thomas. *Langman's Medical Embryology.* - issue. Grada Publishing as, 2011. 414 pp. ISBN 9788024726403 .