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How are Pediatric Congenital Heart Defects Treated?



By Jonas Wilson, Ing. Med.

Congenital heart defects (CHDs) are the most commonly seen defects that babies are born with. They exist at birth, having arisen during embryonic and/or fetal growth and development. There are many different recognized types of CHDs, which range from simple defects to more complex ones.

Examples of simple defects include holes in the cardiac septum (e.g. ventricular septal defects) or its vessels, while complex abnormalities manifest as combinations of structural and/or functional problems. For example, tetralogy of Fallot (ToF), which is a combination of four anomalies, is a complex CHD.

One study reported that CHD account for approximately 4.2% of all deaths in neonates. In the United States, about 1 in every 4 children who are born with a CHD will have a serious one.

Around 30% of children born with a very critical CHD may not survive past 18 years; however, 95% of children with non-critical CHDs do. Survival is dependent on the severity of the CHD, the time that elapsed before diagnosis, the general health of the patient and the success of the treatment employed.

Often, many children with CHD may not require any treatment, particularly if it is simple, but there are those who do.

Treatment is vital in those with complex defects. Treatment options vary, depending on the nature and severity of the defect.

Procedures that involve catheterization may be used in combination with surgery. However, such a combination is not always necessary, and these techniques may be done independently according to the nature of the CHD.

In addition to these invasive procedures, non-invasive pharmacotherapy may also be used in some instances. Some patients may require medications for many years.

Catheterization

This involves the use of a thin and flexible tube that is inserted into a blood vessel such as the femoral vein, and then threaded backward into the heart.

It is a fairly simple procedure in comparison to surgery, and as a result it is much better tolerated and enables a quicker recovery.

Catheterization is generally the treatment of choice for simple CHD, such as stenosis of the pulmonary valves or atrial septal defects (ASDs).

A small device which is used to close the defect is passed in along the catheter. It may have two small disks to fit, one on each side of the hole. Or it may have an expandable umbrella-like structure which will close the hole.

The device is pushed out of the catheter at the right place to plug the septal defect, and secured so that it remains in place as the catheter is withdrawn. Tissue grows over these disks over a period of months. Thus, as the child grows, there is no need to replace the device used to plug the ASD.

When there is stenosis of the pulmonary valve, a catheter is used to insert a balloon that will eventually be inflated in order to open up the valve leaflets. It is subsequently deflated and removed after the valve opening is sufficiently enlarged.

Surgery

If defects cannot be repaired with the help of catheterization, then surgery is necessary. Open-heart surgical procedures involve opening up the chest to gain direct access to the heart.

Moreover, depending on the severity of the defect, multiple surgeries may be required over a period of time. Various procedures are adopted, including placing patches to close defects, repairing or replacing valves, or transplanting various parts of the heart and its great vessels.

Combinations of these are used in more complex CHD. Children with CHD which has progressed or is already beyond the scope of surgical repair may

need a heart transplant. These cases, fortunately, are very rare.

Reviewed by Liji Thomas, MD

Sources

- www.heart.org/.../Common-Types-of-Heart-Defects_UCM_307017_Article.jsp
- <http://www.cdc.gov/ncbddd/heartdefects/data.html>
- my.clevelandclinic.org/.../hic-pediatric-congenital-heart-defects
- <http://www.nhs.uk/Conditions/Congenital-heart-disease/Pages/Types.aspx>
- <https://www.nhlbi.nih.gov/health/health-topics/topics/chd/treatment>

Further Reading

- [Types of Congenital Heart Defects](#)

Last Updated: Mar 1, 2017