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Developmental Dysplasia (DDH)

Description

This condition represents a disruption in the normal relationship and development between the ball and socket that forms the hip joint. The socket (acetabulum) is abnormally shallow and therefore the ball (head of the thighbone/femur) does not sit into the socket correctly or at all.

Sometimes the ligaments that help to hold the joint in place are stretched which can cause a variable amount of hip looseness or instability ranging from mild to severe. This is graded depending on the degree to which the ball is sitting out of the socket.

Mild cases are those in which the hip is subluxable. 'Subluxable' means that the ball (head of femur) is loose in the socket (acetabulum) and the doctor can move the head within the socket but not completely push it out of the socket.

Moderate cases are those in which the hip is dislocatable. 'Dislocatable' means that the ball can be pushed out of the socket completely by the doctor. The hip however is not in this state permanently, with the ball sitting to some degree in the socket when the doctor is not pushing on the hip.

Severe cases are those in which the hip is dislocated. 'Dislocated' means that the ball (head of the femur) is sitting outside of the socket on a regular basis.

Anatomy

The hip joint is where the femur (thigh bone) sits into the pelvis. The joint itself is a 'ball and socket' joint. The ball is the head of the femur and the socket is a part of the pelvis called the acetabulum. Some doctors may also refer to this as the 'cup' instead of the socket or acetabulum.

In order for your child's hip joint to develop correctly, there needs to be the right amount of pressure and contact between the femoral head and the acetabulum, as the head being correctly placed inside the acetabulum helps to shape the joint as it is formed.

If the head is not in the correct position within the acetabulum then a dysplastic hip will result. 'Dysplasia' comes from the ancient greek with 'dys' meaning 'bad' or 'difficult' and plasis meaning 'formation'. So, put simply, DDH is a bad or incorrect formation of the hip that occurs over time.

Causes

The incident of DDH in the Republic of Ireland is unknown. One study showed that approximately 7 babies per 1000 in the South-east of Ireland were born with DDH.

DDH tends to run in families and tends to affect the left hip more than the right. It can however affect one or both hips of any individual. Those at that are more predisposed to DDH are

First born children

Females

Members of family (parents/siblings) had the same condition

Babies who are breech (coming feet first instead of head first) at the time of birth

Oligohydramnios (low levels of amniotic fluid during pregnancy)

Symptoms

What does the problem feel like?

The child may not have any symptoms such as pain to indicate that there is a problem. Some signs that may be present include

Legs of different lengths

Uneven skin folds on the thigh

Less mobility/flexibility of one leg

Limping, toe walking or waddling way of walking.

Doctor Examination

Early diagnosis is very important with this condition because the earlier it is detected the simpler and less invasive the treatment is likely to be. This in turn helps to prevent problems with the hip in later life.

The paediatrician will perform an examination of your baby. This will include looking for the visual clues already mentioned in the symptoms section. They will then perform a physical examination where they check if the hip is subluxable, dislocatable, or dislocated as previously described. This is done by special manoeuvres performed by the doctor during which they listen and feel for clunks or abnormal movement within the hip joint.

Additional tests

Newborns that are at higher risk for DDH or babies that have abnormalities detected on the physical examination by your doctor will have an ultrasound of their hip if they are under three months of age. This is not a painful test and will create an image of the hip for the doctor to accurately diagnose your child and help determine how severe the condition is.

If your child is over four months of age they will have an X-ray which gives a better picture of the hip joint at this age compared with an ultrasound. The x-ray will then be used for the same purpose as the ultrasound.

Treatment

The goal of treatment is to keep the femoral head in the correct position of contact with the acetabulum. This will encourage a normally shaped and stable hip joint to develop as the child grows.

When DDH is detected at birth or very early life, it normally can be treated with a harness or brace. However, later detection can mean more complicated or invasive treatment with less predictable results.

Non-surgical treatment:

Newborns: The baby will be placed in a Pavlik harness for a period of six weeks or more depending on the progress of normal development of the hip. This is a soft positioning device worn by the baby that keeps their femoral head in an optimal position of contact with the acetabulum to encourage normal hip development. It allows some freedom of movement of your babies' legs and easy nappy care. Your local doctor or nurse will train you in how to safely change nappies/feed/dress your baby etc. while the harness is worn.

How long will the harness be worn?

The duration that babies need the harness for varies. It is usually worn full time for at least six weeks and then part-time for an additional six weeks. A prolonged duration will be required if a normal hip has not developed at the end of the first six weeks. It is very important that the parents ensure their baby is wearing the brace for as much time as is prescribed as poor compliance can result in poor results.

1-6 months of age: This is similar to treatment of newborns. Initially a harness will be fitted in a similar fashion to that of newborns and for similar duration. If the hip will not stay in position with a harness or your baby has outgrown the harness, an abduction brace will be fitted. This again is a positioning device but is made of firmer material that will keep your baby's hip in the correct position.

In some instances, your doctor may tell you a 'closed reduction' is necessary. This is where your baby will be given a general anaesthetic and in the operating theatre. The doctor will then gently 'reduce' the hip joint by manipulating it into the correct position from a subluxed or dislocated position. They will then apply a 'hip spica'. This is a cast applied to your baby from waist to ankle. This maintains the correct position of the ball in the socket until the ligaments around the hip tighten up to help keep the hip in the correct position. The cast is usually replaced every two weeks to one month while it is needed.

Over six months; Treatment options include a brace or closed reduction as previously described. Failing this, surgical intervention may be required.

Surgical treatment

If harnessing, bracing, or spica casting fails to correctly align the joint, open surgery will be necessary. Surgery involves an incision allowing the surgeon to access the hip and soft tissues. The specific procedure performed depends on the hip alignment and age of the child.

In some cases, the femur (thighbone) may be shortened in order to put the head of the femur into the acetabulum.

In other cases, the instability can worsen as your child grows and becomes more active. Surgery may be needed to re-align the socket and create anatomy that resembles a normal hip.

Because the skeleton is still forming in children, many of the changes created at surgery will remodel dramatically and create a hip socket that will serve the child well into adulthood with minimal problems.

Complications

The Pavlik harness and brace can cause skin irritation around the straps. You will be taught by the healthcare staff to monitor for this and care for it. A difference in leg length may persist even after treatment. Growth disturbances in the leg are rare, but a disturbance in the blood supply to the femur can occur affecting the growth of the thighbone.

Children who have been treated with spica casting may have a delay in walking. Walking development will however proceed in a normal way once the cast is removed.

Outcomes

Children with DDH, when diagnosed early and treated successfully, are able to develop a normal hip joint and have no limitation in function.

Even with appropriate treatment however, hip deformity and osteoarthritis may develop later in life, especially when treatment is commenced after the age of two years old.

All children that require surgery for DDH have a higher risk of developing arthritis of the hip as they age into adulthood.

DDH if left untreated can lead to pain and osteoarthritis by early adulthood. It can result in leg length inequality, loss of range of motion and a limp.

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