

What Happens in Children with Legg-Calve-Perthes Disease When They Become Adults?

That's a long title but it reflects a long journey from childhood into adult years with a condition called Legg-Calvé-Perthes disease (LCP). How does the disease affect children with and without treatment? How does the disease affect them as adults? These are the questions addressed in this article.

Legg-Calvé-Perthes disease affects the hip (or hips) of children between the ages of four and eight most often. But the condition develops after there has been an interruption in blood flow to the growing centers of the hip.

Those growth centers (called the capital femoral epiphyses) are located at the round top of the femur (thigh bone). With the disease, a process referred to as necrosis.

The dead bone cells are eventually replaced by new bone cells but this can take several years. In the meantime, pressure is applied to the femoral head, which can cause it to flatten. The smooth, round head of the femur that sets inside the hip socket (acetabulum) becomes oval-shaped (oval-shaped) inside the acetabulum, bone extrudes or expands outside the confines of the socket.

In severe cases (and especially in children who develop this condition after age eight), the deformed hip may develop arthritis. For children who don't have signs of LCP until into their teen years, the chances of full recovery is very slim. That's because the bone has already started to remodel.

In all cases, the more flattened the bone and the more misshapen the round femoral head becomes, the more likely degenerative arthritis will develop. The reason for this is that joint surfaces need to be evenly matched or congruent. Without this tight fit, the bones rub against each other. With repeated movements, the joint degenerates where the greatest amount of pressure has been applied.

How does knowing the natural history and prognosis of Legg-Calvé-Perthes disease help children and teens with this condition? MRI scans show the pattern of lost blood even before X-rays. Since the disease is self-limiting (the body heals itself), identifying the disease early can help.

Giving the hip every opportunity to heal itself by limiting load on the joint may prevent the flattening of the femoral head. The problem is -- it can take two to four years for the necrotic bone to get resorbed and replaced by new bone. And in some cases, new granulation (healing) tissue, but that area doesn't harden into bone, it just forms cartilage.

The physician will be able to follow the healing process using X-rays and MRIs. These imaging studies show the four stages of the disease: 1) necrosis (death of bone cells), 2) fragmentation (breakdown of dead bone), 3) regeneration of bone (new bone forms), and 4) consolidation (new bone tissue).

Fractures of the weakened bone develop in about one-third of the children during the fragmentation phase. That's when the femoral head extrusion (spread of bone out from under the hip socket) occurs. Fractures can also develop when new bone is forming.

There are some other complications that can develop during healing. During the fragmentation stage, there is the possibility of osteoarthritis (brittle, weak bone) developing. These problems resolve slowly as the full healing process proceeds from beginning to end.

Fusion of the growth plate too soon can also occur. There is a poorer prognosis if this happens. The neck of the femur (the neck of the round head) stops growing. The effect of this complication is that the affected leg will be shorter than the other leg.

Along with changes on the femur side of the hip, there can also be changes in the acetabular (socket) side. Thickening and changes in shape and size of the acetabulum can affect final outcomes.

In summary, the greater the degree of blood loss and bone changes associated with Legg-Calvé-Perthes (LCP) in children, the poorer the prognosis. Age is the determining factor in this condition. Recovery is more likely in children under the age of eight. Development of arthritis is more likely in children over the age of eight.

prognosis.

But the good news is that many children have mild LCP, and they are able to heal and recover fully even without treatment. The hip joint remains smooth moving. Early degenerative hip arthritis does not always occur and these children have no hip problems or a history of Perthes disease.

Reference: Benjamin Joseph, MD, MS Orth, MCh, Orth. Natural History of Early Onset and Late-Onset Legg-Calvé-Perthes Disease. *Journal of Orthopaedics*. September 2011. Vol. 31. No. 2. Supplement. Pp. S152-S155.