CONDITION

Blount disease

Learn how Blount disease affects leg growth, including symptoms, diagnosis, treatment options, possible complications, and follow-up care.

WHAT IT IS
Growth disorder causing outward-curving lower legs

BODY SYSTEM
Bones and joints

MAIN SYMPTOMS
Outward leg bowing, inward-turned feet, limp, knee discomfort

WHAT CAUSES IT
Unknown, with growth-plate susceptibility and mechanical pressure

HOW IT IS DIAGNOSED
Standing X-rays

MAIN TREATMENT
Observation, bracing or surgery

CAN IT BE CURED?
Sometimes - treatment may correct the deformity

IS IT AN EMERGENCY?
Sometimes - cold, pale or blue foot

LONG-TERM OUTLOOK
Progressive disease can cause knee dysfunction and early osteoarthritis

Overview

Blount disease is a growth disorder that causes one or both lower legs to curve outward. This creates a bowlegged appearance, also called tibia vara . The problem develops near the inner side of the growth plate at the top of the shinbone, or tibia, just below the knee.

A growth plate is an area of developing tissue near the end of a child's bone. In Blount disease, part of the upper tibial growth plate slows down or becomes disrupted. The outer side may continue to grow more normally, causing the leg to bend over time. The shinbone may also rotate inward.

Many babies and toddlers have some normal bowing as their legs develop. This is called physiologic bowing and usually improves as the child grows. Blount disease differs because the deformity may persist or become more noticeable. An examination and, when appropriate,

standing X-rays can help distinguish these conditions.

Blount disease is commonly grouped by the age when it begins. Early-onset, or infantile, disease appears in young children and often affects both legs. Late-onset disease develops in older children or adolescents and may affect only one leg. Age categories vary somewhat among medical sources.

The condition matters because continued uneven growth may make the deformity harder to correct. It can also place abnormal pressure on the knee. Early assessment by a pediatric orthopedic specialist can help determine whether a child needs observation, bracing, or surgery.

Symptoms

The main sign is outward bowing below the knee. Parents may first notice that the knees remain apart when the child stands with the feet together. The bowing may be symmetrical, or one leg may appear more curved than the other.

Other possible features include:

Young children often have no pain. Because normal developmental bowing is also common during early childhood, appearance alone cannot confirm Blount disease.

Older children may report pain around the inner side of the knee after walking, sports, or prolonged standing. Symptoms can also affect physical activity or make a child self-conscious about the appearance of the legs. Pain is not required for the condition to be present.

- Bowing that does not improve or becomes more pronounced with growth
- Inward turning of the feet or shinbones
- A visible change in the direction of the knee while walking
- A limp or uneven walking pattern
- One leg becoming shorter than the other
- Knee discomfort, especially in an older child or adolescent
- A feeling that the knee is unstable or shifts outward during a step

Causes and risk factors

The exact cause of Blount disease is not fully understood. It appears to result from a combination of growth-plate susceptibility and mechanical pressure across the inner part of

the upper tibia. When that area receives repeated or uneven pressure, normal bone growth may be disturbed.

Factors associated with Blount disease include:

Blount disease is reported more often among Black children. Race itself is not a biological cause, and the reasons for this association are not fully established. Genetic, developmental, environmental, and health-access factors may all contribute.

Not every child with a risk factor develops Blount disease. Similarly, a child can develop the condition without an obvious risk factor. Parents should not assume that the condition resulted from something they did or did not do.

Other conditions can also cause bowed legs. These include vitamin D deficiency, rickets, skeletal growth disorders, previous injury, infection, and other problems affecting bone development. A clinician considers these possibilities during the evaluation.

- Higher body weight, which increases force across the knee and growth plate
- Walking at an early age
- A family history of bowed legs or Blount disease
- Rapid growth
- Certain patterns of lower-limb alignment

Diagnosis

Diagnosis begins with a medical history and physical examination. The clinician may ask when the bowing was first noticed, whether it has changed, when the child began walking, and whether there is pain, limping, or a family history of similar leg alignment.

During the examination, the clinician looks at the child's legs while standing and walking. They may assess:

If Blount disease is suspected, standing X-rays are commonly used. Images may include the legs from the hips through the ankles so that overall alignment can be measured. X-rays can show changes in the upper tibial growth plate and nearby bone. They can also help a specialist assess the severity and track progression over time.

Doctors sometimes classify early-onset disease by stages based on X-ray findings. Staging can support treatment planning, but it is only one part of the decision. The child's age, remaining growth, degree of deformity, symptoms, and previous treatment also matter.

Magnetic resonance imaging, or MRI, is not needed for every child. It may be considered when

early growth-plate changes are uncertain, the condition is advanced, or detailed information is needed before surgery. Blood tests are not routinely required for typical Blount disease, but they may be ordered if the history or examination raises concern for a nutritional, hormonal, or metabolic bone disorder.

- Whether one or both legs are affected
- Where the bowing is centered
- Knee stability and range of motion
- Rotation of the thigh and shin
- Foot position
- Leg lengths
- The child's walking pattern and weight-bearing alignment

Treatment and management

Treatment aims to restore healthier leg alignment, reduce uneven pressure on the knee, and support normal function. The best approach depends on the child's age, the severity of the deformity, whether it is progressing, and how much growth remains.

Observation

Some young children with mild, symmetrical bowing may be observed before a diagnosis is clear. The clinician may schedule repeat examinations and standing X-rays to see whether alignment improves or worsens.

Observation does not mean ignoring the problem. Follow-up is important because progressive Blount disease may benefit from treatment while the child still has substantial growth remaining.

Bracing

A knee-ankle-foot brace may be considered for selected young children with early and relatively mild disease. The brace supports the leg and applies corrective forces during growth.

Bracing does not work equally well for every child. Results may be less predictable when the deformity is advanced, both legs are severely affected, or the child is older or has a higher body weight. A pediatric orthopedic team determines whether bracing is reasonable and explains how long and how often it should be worn.

The brace must fit properly. Families should check the skin for persistent redness, sores, pressure areas, or swelling and report these concerns to the treating team. Brace adjustments

may be needed as the child grows.

Surgery

Surgery may be recommended when the deformity is moderate or severe, continues to progress, does not respond to bracing, or is diagnosed after the best period for brace treatment. The planned procedure depends on growth remaining and the shape and location of the deformity.

Guided growth temporarily slows growth on one side of a growth plate so that the other side can gradually improve alignment. This approach requires enough remaining growth and regular monitoring. Hardware may need to be removed when correction is achieved.

An osteotomy involves cutting and realigning the bone. The corrected bone may be held with plates, screws, pins, a cast, or an external frame outside the leg. Osteotomy can correct larger or more complex deformities and may also address rotation or leg-length differences.

Advanced disease may require treatment of a damaged growth-plate area or a combination of procedures. Some corrections are performed in stages. The surgeon should explain the expected recovery, limits on weight-bearing, physical therapy needs, and the possibility of further surgery as the child grows.

Healthy nutrition and weight management may reduce stress on the knees, particularly when higher body weight is contributing to mechanical load. These measures support orthopedic treatment but do not reverse an established growth-plate deformity by themselves. Advice should be appropriate for the child's age, development, and overall health.

Complications

Untreated or progressive Blount disease can lead to increasing bowing and inward rotation of the shin. The abnormal alignment may concentrate pressure on the inner side of the knee, affecting cartilage and the meniscus, which is a shock-absorbing pad within the joint.

Possible long-term problems include:

Treatment also has possible risks. Depending on the procedure, these may include infection, stiffness, nerve or blood-vessel injury, delayed bone healing, overcorrection, undercorrection, or recurrence during later growth. An external frame may cause irritation or infection around pin sites. The orthopedic team can explain which risks apply to a proposed treatment.

Recurrence does not necessarily mean that treatment was performed incorrectly. Blount disease affects a growing area of bone, and the deformity may return if abnormal growth continues.

- Persistent or recurrent leg deformity
- Knee pain or instability
- A limp or reduced ability to participate in activities
- A difference in leg length
- Reduced knee function
- Earlier development of knee osteoarthritis

Follow up

Routine follow-up usually includes examination of leg alignment, walking, knee movement, and leg length. Standing X-rays may be repeated at intervals chosen by the orthopedic specialist. Children using a brace need appointments to assess fit, skin health, and response to treatment.

After guided-growth surgery, regular imaging is especially important. Continued correction can eventually move the leg past the desired alignment if the hardware is not removed or adjusted at the appropriate time. Children who have an osteotomy need monitoring of bone healing and alignment.

Contact the treating team promptly for worsening bowing, a new limp, increasing knee pain, brace-related skin sores, or concerns about a cast or surgical wound. These issues usually require timely clinical advice but are not automatically emergencies.

After surgery or while wearing a cast, seek urgent medical assessment for increasing pain that is not controlled as expected, marked swelling, spreading redness, fever with wound drainage, new numbness, or difficulty moving the toes.

A cold, pale, or blue foot, sudden loss of feeling or movement, severe rapidly increasing pain, or a very tight and swollen limb may signal a problem with circulation or pressure in the leg. These symptoms require emergency care.

Sources

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