CONDITION

Balo disease

Learn how Balo disease affects the brain and spinal cord, including possible symptoms, MRI findings, treatment options, complications, and follow-up care.

WHAT IT IS
Rare inflammatory demyelinating disease

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Weakness, numbness, vision changes, seizures

WHAT CAUSES IT
Unknown, likely immune attack

HOW IT IS DIAGNOSED
Brain MRI, rarely brain biopsy

MAIN TREATMENT
Anti-inflammatory immune treatment

CAN IT BE CURED?
No - treatment cannot repair existing injury

IS IT AN EMERGENCY?
Sometimes - sudden weakness or first seizure

LONG-TERM OUTLOOK
Substantial recovery or lasting neurological difficulties

Overview

Balo disease, also called Baló concentric sclerosis , is a rare inflammatory condition that damages myelin in the central nervous system. Myelin is the protective covering around nerve fibers in the brain, spinal cord, and optic nerves. Damage to myelin can interrupt the signals that control movement, sensation, vision, speech, and thinking.

Balo disease is considered part of the group of inflammatory demyelinating diseases that includes multiple sclerosis, or MS. Some people have a single Balo-type attack. Others later develop additional areas of inflammation or meet the criteria for MS. The course cannot always be predicted when symptoms first appear.

The condition is named for the ring-like pattern often seen in affected tissue. On magnetic resonance imaging, or MRI, a lesion may contain alternating layers of damaged and relatively

preserved myelin. This can look like the rings of an onion or a target.

Balo lesions can sometimes be large and cause swelling. As a result, the condition may resemble a brain tumor, infection, stroke, or another inflammatory disorder. Careful evaluation by a neurologist is important because these conditions require different treatment.

Symptoms

Symptoms depend on the location, size, and number of lesions. They may develop over days or weeks, although a slower or more sudden course is possible. Some symptoms improve as inflammation settles, while others can last longer.

Possible symptoms include:

These symptoms are not specific to Balo disease. Many neurological conditions can cause similar changes, and a medical evaluation is needed to identify the cause.

Sudden weakness, facial drooping, severe trouble speaking, a first seizure, loss of consciousness, or a rapid decline in alertness should be treated as an emergency. Emergency assessment is also appropriate for a severe new headache with confusion, repeated vomiting, or neurological symptoms. These changes may have causes other than Balo disease, including stroke.

- Weakness or reduced control of an arm, leg, or one side of the body
- Numbness, tingling, burning, or reduced sensation
- Trouble walking, poor balance, or clumsy movement
- Muscle stiffness or spasms
- Blurred vision, double vision, or loss of vision
- Difficulty speaking, finding words, reading, or understanding language
- Problems with memory, concentration, planning, or judgment
- Changes in behavior, personality, or alertness
- Headache, nausea, or vomiting, particularly if a lesion causes swelling
- Seizures

Causes and risk factors

The exact cause of Balo disease is unknown. Available evidence suggests that the immune

system mistakenly attacks myelin. Inflammation then produces areas of demyelination, meaning loss of the myelin covering, alongside rings where myelin is relatively preserved.

Researchers have proposed that the ring pattern may reflect changes in how brain tissue responds to inflammation, low oxygen stress, and tissue injury. These findings help explain the appearance of the lesions, but they do not establish one underlying cause.

Balo disease has been reported in both children and adults and in people from many racial and ethnic groups. Earlier reports suggested a possible geographic or ethnic pattern, but the condition is not limited to any one population. Because it is rare, dependable risk factors have not been established.

Balo disease is not contagious. It is not generally considered a directly inherited disorder, although genes that affect immune function may influence susceptibility to demyelinating disease more broadly. Having a relative with MS or another autoimmune condition does not mean that a person will develop Balo disease.

In some people, a Balo lesion occurs as the first recognized episode of an MS-like illness. In others, it appears in someone already diagnosed with MS. A single Balo lesion does not automatically mean that a person has MS.

Diagnosis

Diagnosis begins with a detailed history and neurological examination. The clinician will ask how quickly symptoms developed and will check strength, sensation, reflexes, coordination, vision, speech, memory, and alertness.

Brain MRI is the main imaging test. A typical Balo lesion has concentric rings of abnormal signal, although the full pattern may not be visible on every scan. Contrast material may show which parts of a lesion are actively inflamed. Other MRI methods, including diffusion imaging, can provide more information about tissue injury.

MRI findings must be interpreted in context. Large inflammatory lesions can resemble a glioma or lymphoma, which are types of cancer, as well as an abscess, stroke, or other form of demyelination. Follow-up MRI may show how the lesion changes over time and can help distinguish among these possibilities.

MRI of the spinal cord may be performed if symptoms suggest spinal involvement or if the clinician is looking for other areas of demyelination.

A lumbar puncture, also called a spinal tap, may be recommended. This procedure collects cerebrospinal fluid, the liquid surrounding the brain and spinal cord. Testing may look for signs of inflammation, infection, or immune activity. Oligoclonal bands are antibodies commonly

associated with MS, but they may be present or absent in Balo disease. Their absence does not rule it out.

Blood tests may be used to look for infections, metabolic problems, or autoimmune diseases that can produce similar symptoms. Depending on the clinical picture, testing may include antibodies linked to other demyelinating conditions, such as aquaporin-4 antibody and myelin oligodendrocyte glycoprotein antibody. These are associated with neuromyelitis optica spectrum disorder and MOG antibody-associated disease, respectively.

A brain biopsy is rarely needed when the MRI pattern and clinical findings support the diagnosis. It may be considered if imaging remains unusual, a tumor or infection cannot be excluded, or the condition does not respond as expected. Because biopsy is invasive, its possible benefit is weighed against risks such as bleeding, infection, and injury to nearby brain tissue.

There are no separate, universally accepted diagnostic criteria for Balo disease. A neurologist, often with input from a neuroradiologist, combines the symptoms, MRI pattern, laboratory results, and changes over time.

Treatment and management

Balo disease is uncommon, so treatment evidence comes mainly from case reports, case series, and experience with MS and related inflammatory demyelinating conditions. There is no medication approved specifically for Balo disease, and the best approach depends on symptom severity, lesion location, diagnostic certainty, and whether the illness is a single episode or part of a relapsing condition.

High-dose corticosteroids like prednisone or hydrocortisone are commonly used for an acute inflammatory attack. These medicines reduce immune activity and brain inflammation. They may be given through a vein and sometimes followed by oral treatment. The treating team decides the form and duration based on the individual situation.

Corticosteroids can cause short-term effects such as sleep difficulty, mood changes, increased blood sugar, indigestion, and a higher risk of infection. Monitoring is especially important for people with diabetes, a history of significant mood symptoms, or other medical concerns.

If a severe attack does not improve adequately with corticosteroids, plasma exchange may be considered. Plasma exchange removes part of the liquid portion of the blood and replaces it, with the goal of reducing harmful immune substances. It is performed in a hospital or specialized treatment center. Evidence for its use in Balo disease is limited, but it is used for

selected severe attacks of central nervous system demyelination.

Intravenous immunoglobulin, or IVIG, has been used in some cases. IVIG contains antibodies collected from donated plasma and can change immune activity. Its role in Balo disease is uncertain, so it is generally considered only in selected circumstances.

Long-term immune treatment is not automatically needed after one Balo lesion. If there are relapses, additional MRI lesions, or evidence that the person has MS, a neurologist may discuss an MS disease-modifying therapy. These medicines aim to reduce future inflammatory attacks rather than repair existing injury. The choice requires an individual discussion of expected benefits, monitoring, pregnancy plans, infection risks, and other health conditions.

Supportive care can be important during recovery. Physical therapy may address weakness, stiffness, balance, and walking. Occupational therapy can help with daily activities and safe return to work or school. Speech-language therapy may assist with communication, swallowing, or cognitive difficulties.

Other treatment may target specific problems, such as seizures, pain, muscle spasms, bladder symptoms, or mood changes. People should not stop corticosteroids, seizure medicines, or immune therapies suddenly without guidance from the prescribing clinician.

Complications

Some people recover substantially after treatment, while others have lasting neurological difficulties. The likely outcome depends in part on the lesion's location, the amount of tissue injury, and how the condition changes over time.

Possible complications include persistent weakness, altered sensation, vision problems, speech or memory difficulty, seizures, and reduced independence with daily tasks. Large lesions may cause brain swelling and pressure on nearby structures. This requires close monitoring and, in uncommon severe cases, intensive hospital treatment.

A person may have another inflammatory episode or develop new lesions that support a diagnosis of MS. However, a relapsing course does not occur in everyone.

Treatment can also cause complications. Corticosteroids and longer-term immune therapies may increase infection risk or require blood tests and other monitoring. Plasma exchange can affect blood pressure, bleeding risk, mineral levels, or intravenous catheter sites. The care team should explain the expected benefits and risks before treatment.

Follow up

Follow-up is usually coordinated by a neurologist. Routine visits are used to review recovery, repeat the neurological examination, assess treatment effects, and discuss new symptoms. Follow-up MRI is often used to see whether a lesion is shrinking, whether inflammation remains active, and whether new lesions have appeared. The timing depends on the initial findings and clinical course.

Rehabilitation needs may change as recovery progresses. Persistent fatigue, cognitive problems, mood symptoms, and difficulty returning to work or school should be discussed even if strength or walking has improved. These symptoms can affect daily life and may respond to targeted support.

Contact the treating clinician promptly for new or steadily worsening numbness, weakness, vision changes, balance problems, confusion, speech difficulty, or seizure-like events. These symptoms may indicate renewed inflammation, a treatment complication, an infection, or another medical problem.

Seek emergency help for:

Routine follow-up remains important even when symptoms have resolved. New MRI activity can occasionally appear before it causes noticeable symptoms, and ongoing review can clarify whether the episode remains isolated or is part of a broader demyelinating disease.

- Sudden facial drooping, weakness, or inability to speak
- A first seizure or a seizure lasting longer than directed in an existing emergency plan
- Loss of consciousness or rapidly worsening alertness
- Severe headache with repeated vomiting, confusion, or new neurological symptoms
- Trouble breathing or a severe allergic reaction during or after treatment

Sources

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