CONDITION

Craniotabes

Craniotabes is an area of unusually soft, flexible skull bone, usually found in a young baby.

WHAT IT IS
Soft, flexible areas of skull bone

BODY SYSTEM
Bones and skeleton

MAIN SYMPTOMS
Soft skull patches, springy indentation, usually no pain

WHAT CAUSES IT
Normal newborn softness or reduced bone mineralisation

HOW IT IS DIAGNOSED
Skull examination; blood tests and X-rays when needed

MAIN TREATMENT
Observation or treatment of the underlying bone disorder

CAN IT BE CURED?
Sometimes - newborn cases often resolve

IS IT AN EMERGENCY?
No - isolated skull softness is not an emergency

LONG-TERM OUTLOOK
Usually resolves; outlook follows any underlying condition

Overview

Craniotabes means that part of the skull feels unusually soft and flexible. Gentle pressure may make the bone dip inward and spring back, similar to pressing a table-tennis ball.

It is a physical finding rather than a disease. It is usually noticed at the back or sides of a baby's skull during an examination. The soft area is different from a fontanelle, one of the normal gaps between skull bones.

Craniotabes can be a temporary feature of early skull development, especially in newborns and babies born prematurely. The bone usually becomes firmer during the first few months of life.

Sometimes it is a sign that the skull is not receiving or using enough minerals. This can happen with rickets, in which growing bones do not mineralise properly. Possible causes include vitamin D or calcium deficiency, medical conditions, and uncommon inherited disorders.

The soft area alone does not reveal its cause. The baby's age, growth, feeding, examination, and other symptoms help determine whether testing is needed.

Symptoms

Craniotabes often causes no discomfort and may only be found during an examination.

Typical features include:

Craniotabes does not usually affect alertness, feeding, movement, or brain development. Problems in these areas suggest another issue and should not be attributed to skull softness.

If rickets or another bone condition is present, additional findings may include slow growth, delayed movement skills, widened wrists or ankles, bowed legs, muscle weakness, or delayed tooth development. Some signs appear later.

Do not repeatedly press the area to test it. This cannot show whether the cause is harmless or requires treatment.

- A soft or thin-feeling area at the back or side of the skull
- Bone that briefly indents under gentle pressure and springs back
- More than one soft patch in some babies
- No redness, swelling, or pain in an uncomplicated case

Causes and risk factors

In a young newborn, craniotabes may reflect normal flexibility while the skull is still mineralising. Pressure on the skull around birth may also contribute. Babies born prematurely have had less time for bone mineralisation before birth, making soft areas more noticeable.

Craniotabes can also occur with nutritional rickets. Vitamin D helps the body absorb calcium and supports bone mineralisation. Low vitamin D, inadequate calcium intake, or both can interfere with this process.

A baby's vitamin D status is influenced by stores at birth and feeding after birth. Human milk has many benefits but generally does not provide enough vitamin D by itself to meet an infant's needs. Supplement recommendations depend on local guidance and the baby's circumstances.

Less common causes of poor bone mineralisation include:

These causes usually produce other symptoms, examination findings, or abnormal tests.

Craniotabes alone cannot identify a specific cause.

- Conditions that reduce absorption from the intestine
- Long-term liver or kidney disease
- Medicines that affect vitamin D or bone metabolism
- Inherited disorders involving phosphate, calcium, or vitamin D
- Bone-fragility conditions
- Infections present from birth, including congenital syphilis

Diagnosis

Craniotabes is diagnosed by examining the skull. A clinician gently feels the head and assesses the location and size of the soft area and whether it springs back. The fontanelles, skull shape, head size, and skull seams are also checked.

An isolated soft area in an otherwise well newborn may only need routine observation. Testing is more likely if the softness is extensive, persists beyond early infancy, or occurs with poor growth, bone changes, weakness, developmental concerns, or other symptoms.

When rickets or another mineral disorder is possible, blood tests may measure:

Results must be interpreted together. Blood calcium, for example, may remain within the usual range even when nutritional rickets is present.

X-rays may be used to look for rickets. Images of a wrist or knee are often more useful than a skull X-ray because changes are easiest to see near rapidly growing ends of bones.

Further tests may be needed if there are signs of an inherited disorder, kidney disease, poor absorption, or an infection acquired before birth.

- Calcium and phosphate
- Alkaline phosphatase, which often rises when growing bone is poorly mineralised
- Parathyroid hormone, which helps control calcium
- 25-hydroxyvitamin D, the main test for vitamin D status
- Kidney or liver function when relevant

Treatment and management

An otherwise well newborn with isolated craniotabes may not need specific treatment. Growth

and skull firmness can be checked during routine visits.

When nutritional rickets is diagnosed, treatment restores adequate vitamin D and calcium. The products, doses, and treatment length depend on the baby's age, diet, test results, and underlying cause. Follow-up blood tests or X-rays may confirm that the bones are healing.

Do not give high-dose vitamin D or calcium without medical guidance. Excessive amounts can be harmful, and treatment for confirmed rickets differs from routine prevention.

If poor absorption, kidney or liver disease, or an inherited mineral disorder is responsible, treatment targets that condition. Care may involve a paediatrician and specialists in children's bones, hormones, kidneys, or digestion.

Congenital syphilis requires antibiotic treatment and follow-up. Craniotabes itself does not need surgery, a helmet, or massage.

Normal handling, cuddling, bathing, and supervised play can continue. Standard head-injury precautions and safe-sleep guidance still apply.

Complications

Isolated newborn craniotabes usually causes no complications. It does not mean the brain is soft, and a small flexible area does not usually interfere with brain growth.

Complications mainly arise from an underlying condition. Untreated rickets can cause bone pain, muscle weakness, delayed movement skills, fractures, or changes in the shape of the legs, ribs, wrists, or skull.

Severely low calcium can cause muscle spasms or seizures. This is uncommon but requires emergency care. Long-standing mineral problems may also affect growth and teeth.

The outlook for inherited, kidney-related, or absorption-related disorders depends on how well the condition can be controlled. Early recognition may reduce bone complications.

Prevention

Normal newborn craniotabes cannot always be prevented. It may occur as part of early skull development and does not necessarily reflect anything done during pregnancy or after birth.

Some cases related to nutritional rickets are preventable. Adequate vitamin D and calcium during pregnancy, infancy, and childhood support bone mineralisation. Infant vitamin D recommendations vary with feeding, health needs, and national guidance, so follow local medical advice.

A balanced diet becomes important when solid foods are introduced. Children with restricted diets, poor absorption, kidney or liver disease, or medicines that affect bone may need individual monitoring.

Inherited bone and mineral disorders cannot usually be prevented through diet or lifestyle, but early diagnosis and ongoing treatment may prevent complications.

Routine pregnancy screening and treatment for syphilis can prevent many cases of congenital syphilis and related bone problems.

Living with it and what to expect

When craniotabes is an isolated newborn finding, the skull commonly becomes firmer over the first few months. The baby can usually feed, sleep, play, and develop normally.

Routine follow-up may include checking head growth, skull firmness, weight, length, and development. If the area becomes firmer and the baby remains well, further testing may not be necessary.

When rickets is responsible, blood results and bone healing improve over time rather than immediately. Follow-up shows whether treatment is working and whether the cause has been addressed. Some bone-shape changes improve as a child grows; established changes may take longer or remain partly visible.

Children with chronic kidney, absorption, or inherited mineral disorders may need long-term blood tests, growth checks, dental care, and bone-strength assessments.

Craniotabes itself does not usually limit future activities. Any longer-term restrictions depend on the underlying condition.

When to get medical help

Arrange a routine appointment if you notice a soft skull area that has not been assessed. Seek follow-up if it is enlarging, remains soft beyond the first few months, or occurs with slow growth, delayed movement skills, bowed limbs, widened wrists, or feeding concerns.

Ask for prompt medical advice if your baby has poor feeding, repeated vomiting, unusual weakness, persistent irritability, muscle twitching, or seems less responsive than usual.

Seek emergency care for:

These symptoms are not expected from uncomplicated craniotabes and may have another cause requiring urgent assessment.

- A seizure
- Difficulty breathing or blue or grey skin
- Severe muscle spasms
- A baby who is very difficult to wake
- A significant head injury, especially with vomiting or altered behaviour
- A tense, bulging fontanelle while calm, particularly with fever or drowsiness

Common questions

Is craniotabes normal in a newborn?

It can be. A small soft area in an otherwise healthy newborn may reflect normal skull development and often firms during the first few months. Its location, extent, persistence, and associated symptoms determine whether tests are needed.

Does craniotabes always mean my baby has rickets?

No. Rickets is one possible cause, but isolated craniotabes can occur without it. Examination and, when needed, blood tests or X-rays can distinguish early skull softness from poor bone mineralisation.

Is craniotabes the same as a baby's soft spot?

No. A soft spot, or fontanelle, is a normal gap where skull bones have not yet joined. Craniotabes is softness within a skull bone, usually beside a fontanelle.

Can pressing the soft area damage the brain?

A clinician's gentle examination does not damage the brain. There is no benefit to repeatedly checking the area at home. Avoid deliberate pressure and handle the baby normally and safely.

Will vitamin D make the skull firm again?

Vitamin D can help when deficiency contributes to poor bone mineralisation, often together with adequate calcium. It does not treat every cause. Do not give high-dose supplements unless recommended after assessment.

How long does craniotabes last?

Temporary newborn craniotabes often improves during early infancy. Persistent or widespread softness may last longer when there is an underlying disorder. Follow-up checks whether the skull is firming and growth and development remain on track.

Sources

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