

Using Orthotics Made Easy: Osgood Schlatters Disease

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I often have parents bringing their children to see me citing that they suffer from growing pains. They regularly ask if this is normal.

My reply is that if growing pains were normal EVERY child would suffer the same pain – which does not happen. This condition appears to afflict children who are growing fast and often have external Tibial Torsion combined with Internal Tibial Rotation associated with excessive pronation.

Osgood-Schlatter's Disease, is we believe, caused by repetitive stress or tension on the growth plate of the upper tibia (the apophysis),

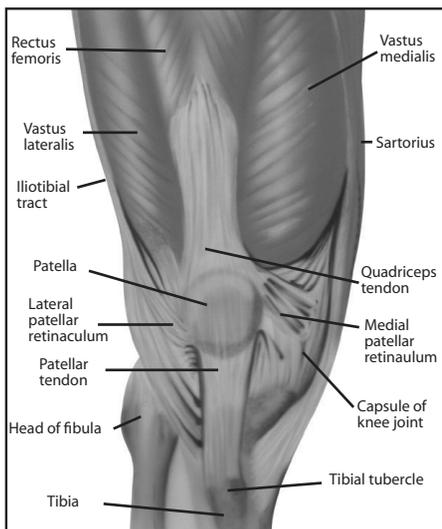


Figure 1: Ligamentous & muscular attachments of the patella.

which can be complicated by growth spurt syndrome and biomechanical deformities or anomalies. The cause of so called 'growing pains' is similar in biomechanical operation to Sever's Disease, except that it occurs at the tibial tuberosity and characterised by inflammation of the patella tendon and surrounding soft tissues at the point where the tendon attaches to the tibia.

It is usually young people who suffer with this disease - experiencing pain just below the knee joint and patella which usually worsens with activity. It is also associated with an avulsion injury (stretching the tendon so much that it tears away from the tibia and in extreme cases takes a fragment of bone with it - See Figure 2).

A bony bump may appear on the upper edge of the tibia (below the knee cap) that may be particularly painful when external pressure is applied. It has been misdiagnosed in the past in Australia as "surfer's knee" (a myth that only surfboard riders suffered from the condition). The hinge motion of the knee is not actually affected.

Most commonly Osgood Schlatters Disease affects active young people, particularly boys between the ages of 10 and 16 who play games or sports that include frequent running and jumping. Also affected are netballers who are required to stop, turn and push off on one leg during the game putting enormous pressure on the lower joints and soft tissues.

Symptoms of Osgood Schlatters Disease include:

- Pain over the tibial tubercle
- Swelling over the tibial tubercle
- Weakness in the quad muscle group

- Increased pain & swelling with activity
- A visible lump at the base of the knee cap
- Pain to the touch over the affected area.

Often the pain may last only a few months or may recur until the child stops growing.



Figure 2: X-ray of Osgood Schlatters

Not a lot has been written about the effect of the combination of a growth spurt combined with both pronation or supination, and internal and external tibial torsion. However, I have observed many cases in which children appear to experience more pain and certainly an increased level of resultant damage to the attachment when these factors occur in combination.

The pain (and resultant effects) become more noticeable during activities that require running, jumping or going up or down stairs and is most common in young athletes who play football, soccer, basketball, netball or who are involved in gymnastics and

ballet.

Contributing Factors Whilst the Child is Still Growing

1. Pronation:

As the foot pronates internal tibial rotation occurs. The body's mechanism of compensation causes the ITB to tighten in the opposite direction causing the patella to laterally and superiorly displace, hence causing a tractional pull on the tibial tuberosity.

2. Supination & Pronation:

Because of the anterior position of the tibial tuberosity, when the foot supinates due to a FFT valgus deformity < 10° in the swing phase of gait, the foot lands laterally then the ground reaction forces (on the lateral side) propel the foot into pronation with the same effect above.

3. Internal Tibial Torsion:

Internal tibial torsion will cause the foot to pronate medially and rotate the tibial condyle medially. The ITB's and gluteals then tighten and come into action as an external rotator of the femur as the compensatory mechanism causing external rotation above the knee and internal rotation below the knee.

The effect of these two actions of rotation causes a 'tug-of-war' effect on the patella and its tendon attachment also causing the tibial tuberosity to stretch and pull.

4. External Tibial Torsion:

This causes the foot to externally rotate in the swing phase of gait combined with iliopsoas compensation at the late swing phase, causing the foot to straighten and land laterally (same effect as 2). Then the ground reaction forces cause the foot to pronate with the help of the psoas pull resulting again in internal rotation above the knee and external tibial torsion position increases tractional forces on the patella and its attachment.

Treatment

- Orthotics moulded to the patient's Neutral Calcaneal Stance Position to realign and hence reduce the effect of tibial rotation.
- Combine orthotic therapy with strapping: use an Osgood schlatters strap (see below) to reduce the tension on the attachment at the growth plate whilst the child is playing sport (see Figure 3).

- Do not stretch as this will exacerbate the tearing - use deep friction massage to help in pain relief.
- R.I.C.E

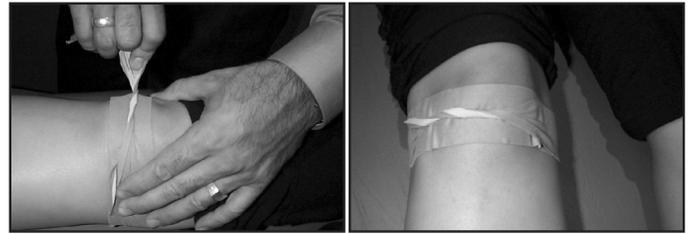


Figure 3: Osgood Schlatters Strapping

Active children may experience shortening of the muscles whilst growing, which coupled with biomechanical anomalies = predisposition to Osgood Schlatters

Contraindications

It is important to differentiate from malignancy, infection, fracture, tendonitis and Sindling-Larsen- Johansson Disease. Initially the diagnosis is based on clinical signs and symptoms including: pain, heat, tenderness and local swelling with prominence at the tibial tuberosity. X-ray is required to establish the extent of the condition.

Do not prescribe steroid injections as this may cause weakening of the infrapatellar ligament, scaring and fat necrosis.

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