

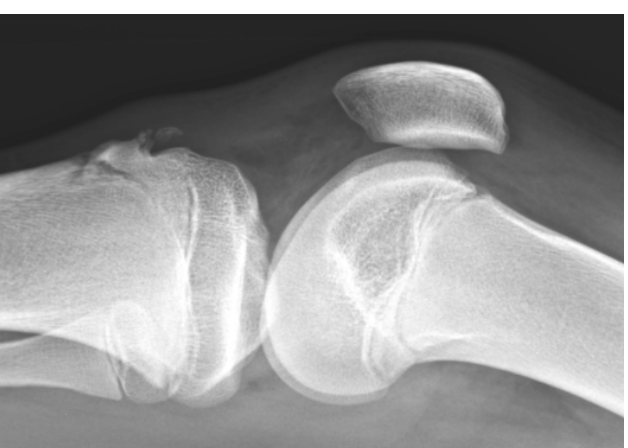
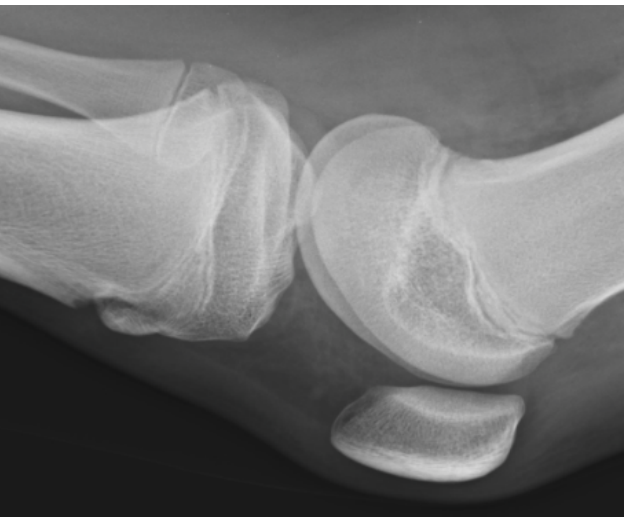
Osgood Schlatter through the ages

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Introduction

- In 1903, Robert Bayley Osgood and Karl Schlatter separately described a painful condition of the anterior tibial tubercle characterized by **partial separation of the tongue-like epiphysis of the tibial tuberosity**, apparently caused by continued strain placed upon it by the patellar tendon.

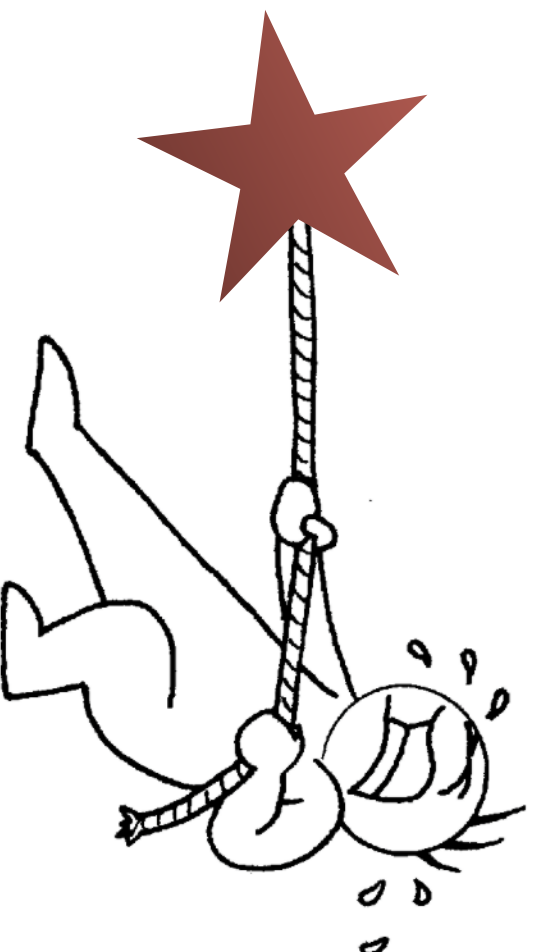


Introduction

- Osgood Schlatter syndrome (OSS) involves the tibial tuberosity in growing children and presents with local pain, swelling and tenderness of the tuberosity.
- The common age of presentation in boys is between the ages of 12 and 15 years and in girls is between the ages of 8 and 12 years.
- The occurrence is reported to be greater in boys than girls and it frequently presents bilaterally (20–30%).

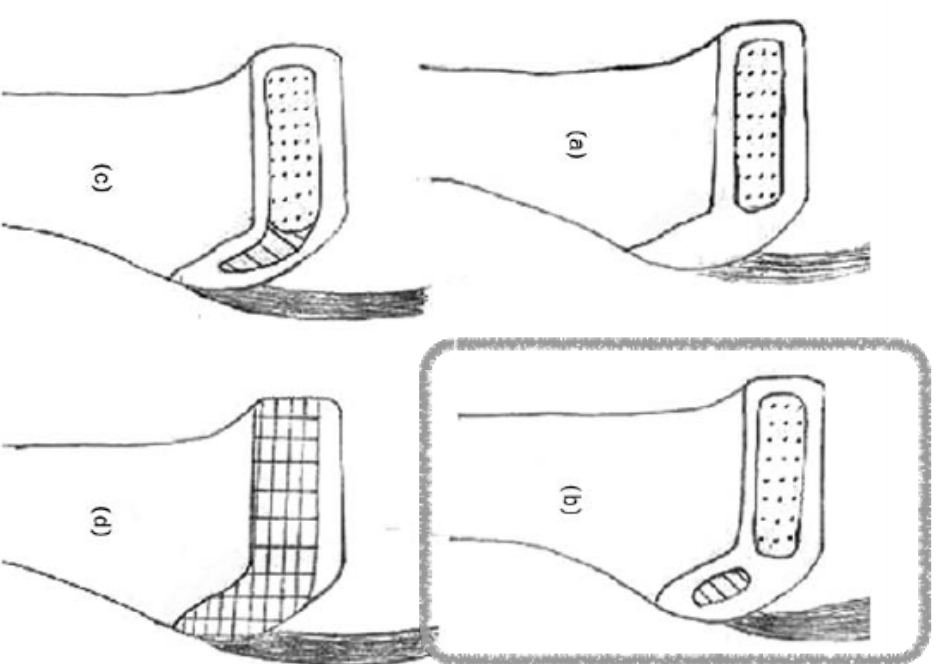
Etioopathogenesis

- Currently it is widely accepted that OSS is a traction apophysitis of the tibial tubercle due to repetitive strain and chronic avulsion of the secondary ossification center of the tibial tuberosity.



Maturation of Tibial Tuberosity

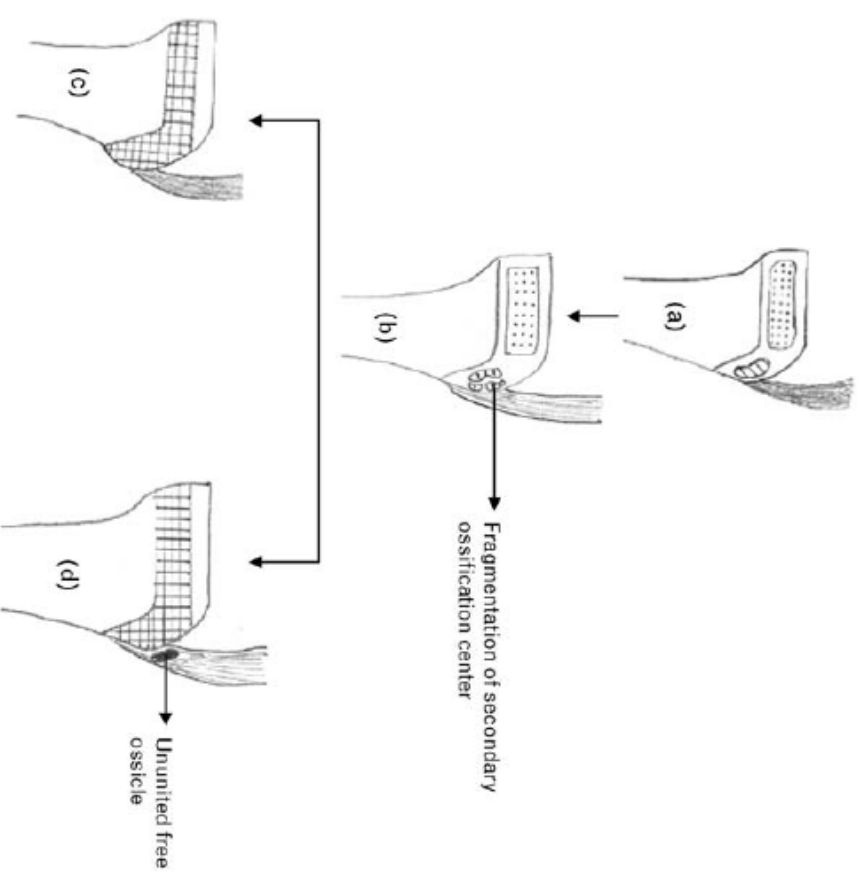
- (a) Cartilaginous stage (aged 0–11 years).
 - (b) Apophyseal stage (aged 11–14 years).
 - (c) Epiphysal stage, the tibial apophysis coalesces with tibial epiphysis (aged 14–18 years).
 - (d) Bony stage, the epiphysis is fused (aged >18 years).
- Adapted and modified from



Ehrenborg and Lagergren radiological stages in maturation of tibial tuberosity

Etio-pathogenesis

- (a) Appearance of the secondary ossification center of tibial tuberosity.
- (b) Fragmentation of the bony ossification center.
- (c) Complete healing and fusion of the apophysis with prominent tuberosity.
- (d) Ununited free ossicle.



Predisposing factors?

- Rectus femoris contracture, patella alta. *Aparicio et al.*
- Short length of the patellar ligament. *Lancourt and Christini*
- Patellar tendon attached more proximally with broader insertion above the tibial physis. *Demirag et al.*
- Increased condylomalleolar angle and external tibial rotation. *Gigante et al.*

No evidence and no consensus

Clinical features

- Boys become symptomatic between the ages of **12 and 15 years** and girls between the ages of **8 and 12 years**. Bilateral symptoms are observed in **20–30%** of patients.
- *Kujala et al: 389 adolescent athletes; Osgood Schlatter in 21% of those actively participating in sports, as compared with only 4.5% in nonparticipants.*

Clinical features

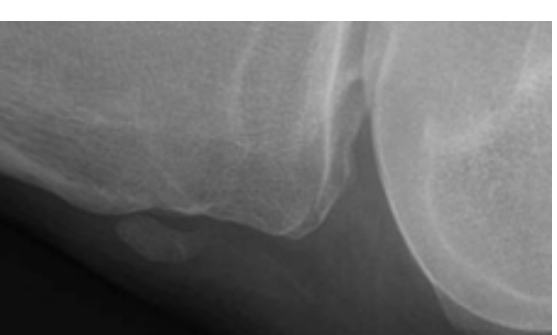
- Usually vague history of **gradual onset pain and swelling** in the region of tibial tuberosity.
- Pain is mild and intermittent initially. In acute phase the pain is severe and continuous in nature.
- Pain **exacerbates after sporting activity** involving jumping (basketball, volleyball, running) and/or on direct contact (e.g. kneeling).
- Physical examination reveals **tenderness, local swelling** and **prominence** in the area of the tibial tuberosity. Pain can be reproduced with extension of the knee against resistance.



OS is a clinical diagnosis

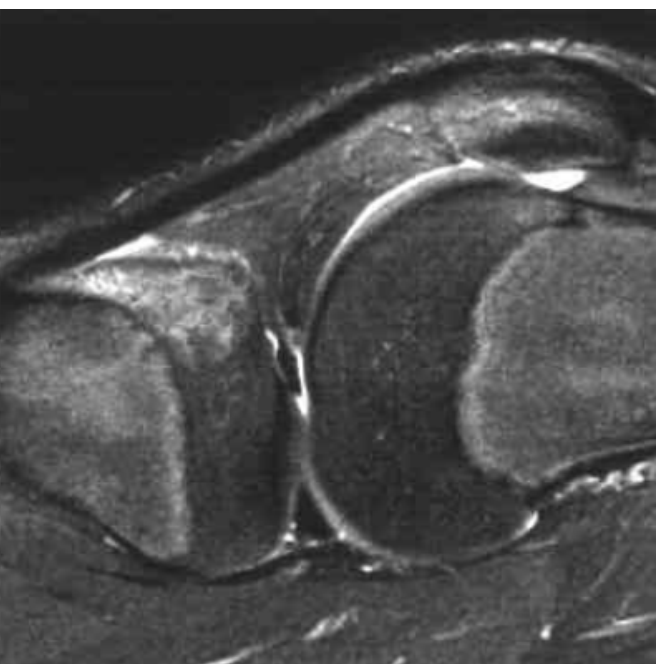
Radiographic features

- **Irregularity of apophysis with separation** from the tibial tuberosity in early stages of OSS and fragmentation in the later stages
- **Persistent bony ossicle** may be visible in a few cases after fusion of the tibial epiphysis: adult
- **Anterior soft tissue swelling** may be the only sign observed very early in the acute phase when avulsion occurs through the cartilaginous portion of the secondary ossification center
- **Rule out other conditions such as acute tibial apophyseal fracture, or tumor**



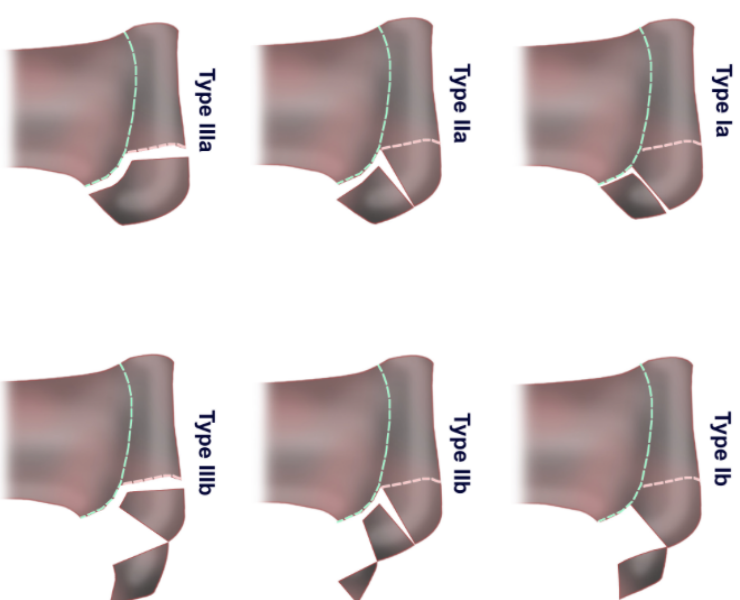
MRI

- Role in diagnosis, prognostication and management is currently limited.
- Can be indicated in adult symptomatic population



Differential Diagnosis

- Sinding–Larsen–Johansson syndrome
- Hoffa's syndrome
- Synovial plica injury
- Tumor
- Tibial tubercle fracture
 - boys between the ages of 12 and 17 years
 - violent contraction of the quadriceps or forceful flexion



Watson Jones classification

Treatment

- There are no prospective, randomized, controlled, interventional studies evaluating the treatment of OSS.
- **Nonoperative treatment** is initially recommended.
- Symptomatic treatment, **limitation of activities**, protective knee padding
- Physical therapy. Rectus femoris stretching
- Those with mild pain and no weakness are allowed to continue sporting activity with the use of antiinflammatory medication and knee padding. Those who have moderate to severe pain may benefit with activity modification, rest and antiinflammatory medication.
- Cast immobilization?

Nonoperative treatment: Results

- Hussain and Hagroo followed 261 patients with OSS for 1–2 years and reported that 237 (91%) patients responded well to activity modification, rest and non steroidal antiinflammatory medication.

Natural History

- Krause et al. reported natural history of OSS in 69 knees of 50 patients. 9 years FU. **76% of patients** did not have any limitation of activity, although 60% were not able to kneel without discomfort. They reported **low incidence of anterior knee pain** and no cases of premature proximal tibial epiphyseal arrest.
- Ross and Villard assessed the disability levels of 25 college-aged male individuals who had history of OSS and compared this with 25 healthy college-aged men with no previous history of OSS matched by age and intercollegiate sport. 7.6 years FU. Their results demonstrated **significantly lower clinical scores in the OSS group** as compared with the normal healthy adults.

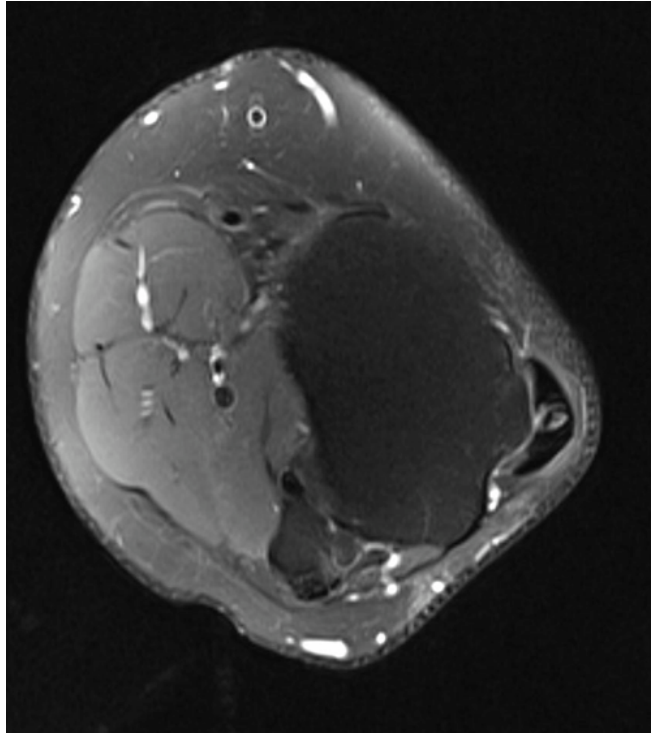
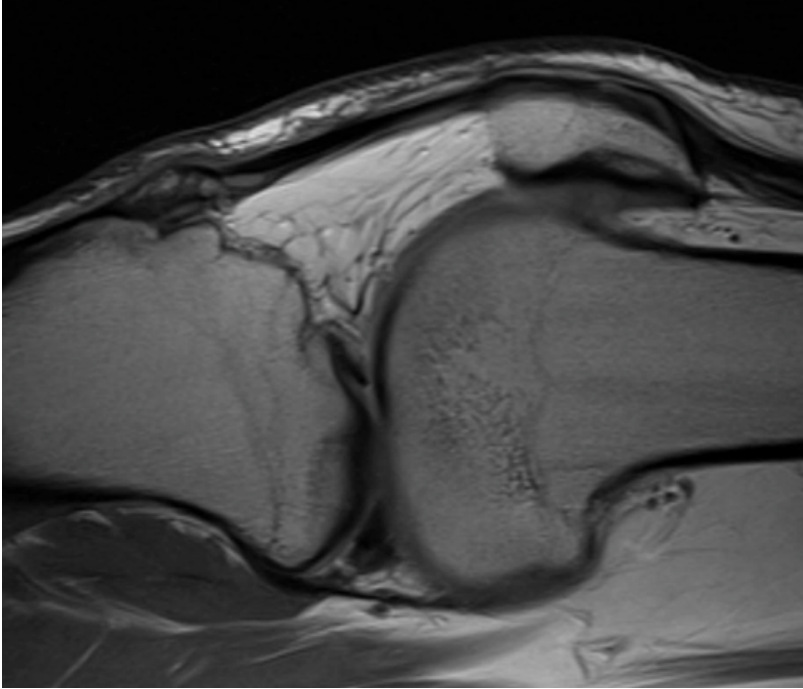
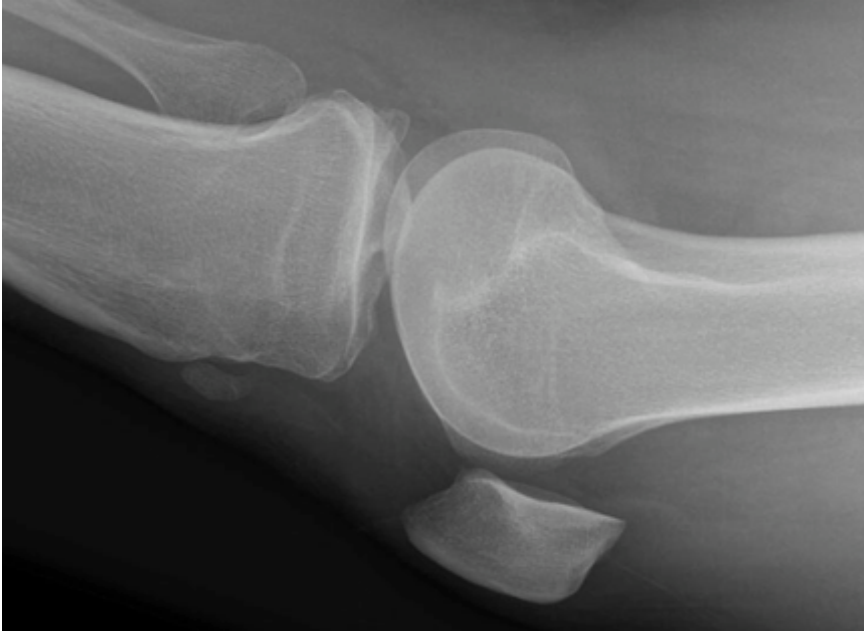
Surgical Treatment: When and Who?

- The symptoms continue unabated in 5 – 10% of patients, despite all conservative measures.
- These patients complain of **local pain**, difficulty in **kneeling** and **restricted activity** into adulthood. Depending on the symptomatology and affected quality of life, surgical intervention may be considered **after skeletal maturity**

Surgical Treatment: What?

- Drilling of the tibial tubercle *Mital*
- Excision of the tibial tubercle, tubercleplasty *Flowers*
- Longitudinal incision in the patellar tendon *Cole*
- Excision of the ununited ossicle and free cartilaginous pieces (tibial sequestrectomy) *Orava*
- Insertion of bone pegs *Bosworth*
- ...Combination of any of these procedures.

Excellent and good results



Summary

- OSS runs a self-limiting course with resolution of symptoms in greater than **90%** of patients.
- In rare cases, **surgical excision of the ossicle** and/or free cartilaginous material may give good results in **skeletally mature patients**, who remain symptomatic despite conservative measures.
- The overall prognosis for OSS is good, except for **some discomfort** in kneeling and activity restriction in a few cases.



Patient Information

Thank you

