

Osgood-Schlatter Disease Case Study HISTORY & INITIAL OBSERVATIONS

History:

Chief Complaint

Client 071 is a 12 year old gymnast who presents complaining of right anterior knee pain that she describes as an intense ache that occurs during and after training. She has been experiencing this pain intermittently for about 2 months and it is steadily getting worse, she finds she is losing strength in her right leg and the quality/skill of her routines are suffering as she is unable to adequately complete jumping moves.

She has been training as a gymnast since she was six and has not previously sustained an injury to her knee. Her current training schedule consists of 6 mornings of cardio (running) workouts per week, gymnastics 5 afternoons and ballet 2 afternoons per week.

Previous History

Client 071 has sustained repetitive right ankle inversion injuries – she estimates at least twice a year for the past 4 years. She wears an ankle brace during training.

Contributing/Aggravating Factors

Her pain is aggravated by running, jumping, squatting and kneeling and slightly by ascending/descending stairs.

Relieving Factors

Rest relieves her pain.

Initial Observations:

General

Client 071 is approximately 5'2" tall and weighs approximately 40kg

Regional

There is mild swelling at the proximal tibial tuberosity; she has an increased lumbar lordosis and anterior pelvic tilt.

DEVELOP A DIFFERENTIAL DIAGNOSIS

Possible Conditions

- Osgood-Schlatter disease
- Sinding-Larson-Johannsen Syndrome
- Quadriceps tendinopathy
- Pre-patellar Bursitis
- Fracture – avulsion
- Tumour - osteosarcoma

Most Likely Diagnosis

- Osgood-Schlatter disease

DEVELOP A PRELIMINARY DIAGNOSIS

Primary diagnosis for chief complaint is Osgood-Schlatter disease. The following research supports the preliminary diagnosis and provides the mechanism of the problem.

Osgood-Schlatter disease is an osteochondrosis that occurs at the growth plate (apophysis) of the tibial tuberosity. It is a common condition in girls of around 10-12 years and boys of around 13-15 years (but these ages vary) (Brukner 2001 p 490 & 658).

The tibial apophysis is susceptible to repetitive stresses; Osgood-Schlatter's is a non-traumatic extensor disorder that is due to overuse. It results from excessive traction on the soft apophysis of the tibial tuberosity by repeated contraction of the powerful patellar tendon that may cause softening and partial avulsion of the developing secondary ossification centre. This condition is extremely common in adolescents; it occurs in association with high levels of activity during a period of rapid growth (Brukner 2001 p 490 & 658), the apophysis may undergo an inflammatory reaction, it is rare for the tendon to avulse the apophysis. It is commonly seen demanding activities such as in running or jumping sports, in hockey with boys and gymnastics and figure skating for girls (Souza 2005 p 908).

Pain and swelling over the tibial tuberosity are relatively diagnostic (Souza 2005 p 908), the pain around the tibial tuberosity is aggravated by exercise and palpation will reveal tenderness over the site. There may be associated tightness in surrounding muscles, especially the quadriceps. The presence of excessive subtalar pronation may predispose the development of this condition. Osgood-Schlatter disease is a clinical diagnosis and x-ray is not usually required unless there is severe anterior knee pain with more swelling than expected, which may indicate a bony tumour (Brukner 2001 p 659).

Anatomical Structures Involved

Bones - Tibia, fibula, patella, femur, talus, tarsals, calcaneus, metatarsals, phalanges, ilium, ischium, pubis

Muscles - Adductors, gluteals, hamstrings, iliopsoas, lateral hip rotators, quadriceps femoris groups, sartorius, tensor fasciae latae and iliotibial band, popliteus, plantaris, gastrocnemius, soleus, peroneus longus and brevis, ankle and toe flexors and extensors.

Ligaments - Lateral and medial collateral ligaments, anterior and posterior cruciate ligaments, menisci, retinaculum (knee and ankle), deltoid ligament, plantar calcaneonavicular, anterior talofibular ligament
Other - Peroneal, tibial & sciatic nerves; popliteal & posterior tibial arteries

PHYSICAL EXAMINATION PROCEDURE

Inspection

- General
- Regional

Palpation

- Near touch
- Skin and superficial fasciae
- Muscles: adductors, gluteals, hamstrings, iliopsoas, lateral hip rotators, quadriceps femoris groups, sartorius, tensor fasciae latae and iliotibial band, popliteus,

plantaris, gastrocnemius, soleus, peroneus longus and brevis, ankle and toe flexors and extensors

- Joints: hip, knee, ankle

Tests Performed

- Postural analysis in 4 views – anterior, posterior, lateral and superior
- Gait and movement analysis
- Active Range of Motion (AROM), Passive Range of Motion (PROM), Active Resisted Range of Motion (ARROM) and Joint Play of the following joints: hip, knee, ankle
- Special tests: Perch test, Squat test

Potential Risks of Selected Tests:

Exacerbation of symptoms and furthering dysfunction through provocation and range of motion testing.

Test Sequence:

- Active range of motion
- Passive range of motion
- Active resisted range of motion
- Joint play
- Special tests

WORKING DIAGNOSIS

Findings:

Inspection

- Decreased thoracic kyphosis and cervical lordosis
- Increased lumbar lordosis
- Anterior pelvic rotation
- Genu recurvatum
- Soft tissue oedema over proximal tibial tuberosity
- Right foot/ankle supinated

Palpation

- Tender and enlarged proximal tibial tuberosity
- Hypertonic and painful: right quadriceps, ITB, hamstrings and gastrocnemius

Tests Performed

- Decreased right knee flexion
- Reproduction of pain on active resisted knee extension – strength fair
- Joint play – all movements within normal limits
- Special tests:
- Perch test positive quadriceps & tensor fasciae latae/iliotibial band hypertonic right and bilateral iliopsoas
- Squat test positive pain at full knee flexion

Working Diagnosis:

Osgood-Schlatter disease with associated myofascial trigger points. Predisposed by repetitive ankle injuries with resultant altered biomechanics and maintained by gymnastic and ballet activities.

DEVELOP A TREATMENT PLAN

Aims of Treatment

- Reduce pain
- Reduce hypertonicity right quadriceps, ITB, hamstrings and gastrocnemius
- Decrease oedema
- Deactivate trigger points
- Increase strength of right quadriceps
- Restore normal spinal curves
- Correct biomechanics and postures
- Educate patient on:
 - Post activity management
 - Activity modification/avoidance
 - Self-care techniques

Treatment Plan

Length:

- 45 minute sessions weekly for 6 weeks, then monthly maintenance if necessary
- Review after each session and cease, continue or refer as appropriate.

Treatment components:

- Hot hydrotherapy to region to warm area
- Effleurage and petrissage to entire thigh and lower leg
- De-activate trigger points using stripping and sustained compression
- Active engagement or direct MFR can be used on iliopsoas, quadriceps, ITB, hamstrings and gastrocnemius
- MET or PNF can be used on quadriceps, hamstrings and gastrocnemius to increase length
- Passive stretching can be used on quadriceps, hamstrings and gastrocnemius to increase length
- Eccentric contraction of quadriceps to strengthen muscle
- Educate patient on post activity condition management, activity modification/avoidance and self-care techniques.

Self Care/Management:

- Relative rest from aggravating activities – reduce intensity or frequency of running/jumping activities – perhaps substitute swimming or deep water running to maintain cardiovascular fitness
- Ice therapy post activity
- Consider Osgood-Schlatter brace or patellar tendon taping during gymnastics, ballet and running workouts
- Exercise program for postural correction:
 - Stretching exercises for: iliopsoas, quadriceps, ITB, hamstrings and gastrocnemius
 - Eccentric strengthening exercises for: quadriceps

IMPLEMENTATION OF TREATMENT PLAN

- The working diagnosis and treatment plan was explained to Client 071 & her mother.
- After the ROM, muscle tests and special tests were explained together with potential risks involved (aggravating her condition), Client 071 & her mother gave their consent to perform the tests.
- From the test findings, the aims and components of the treatment plan were explained to Client 071 & her mother, as well as the risks and benefits; Client 071 & her mother gave their consent to proceed with the treatment.
- An approximate time frame for Client 071 to feel relief from her condition was given along with advice on how to avoid aggravating the condition
- Client 071 was given a self-care exercise programme to manage condition and correct her posture which involved stretching the hypertonic muscles and strengthening the weak/inhibited muscles.

CONFIRM THE DIAGNOSIS

- Results were evaluated after each treatment session.
- After the initial consultation she reported that she trained that evening and there was a slight decrease in symptoms during training and afterwards – she used the ice as instructed.
- The diagnosis of Osgood-Schlatter disease was confirmed by x-ray when the client visited her GP at her mother's insistence following the third treatment.
- In the short term Client 071 will likely have ongoing symptoms as activity does not affect the healing process of the condition - the condition is self-limiting and resolves generally over a period of 6 months to 3 years – at the time of bony fusion of the tibial tubercle.

REFERENCES

Brukner, P. and Khan, K. (2001). Clinical Sports Medicine, 2nd Edition, Sydney: McGraw Hill

Chaitow, L. and DeLany, J. (2000). Clinical Application of Neuromuscular Techniques, Vol 1, The Upper Body, London: Churchill Livingstone

Fritz S., Groesenbach M.J. 2004. Mosby's Essential Sciences for Therapeutic Massage, 2nd ed, Mosby, Missouri.

Gould B. 2002. Pathophysiology for the Health Professions 2nd Ed. Saunders Philadelphia

Haslett C, Chilvers E, Boon N, Colledge N, 2002. Davidson's Principles and Practice of Medicine, 19th Edition, London: Churchill Livingstone

Kandel E.R., Schwartz, J.H., Jessell, T.M. 2000. Principles of Neural Science, 4th ed., McGraw-Hill, New York.

Kisner C, Colby L, 1996. Therapeutic Exercises: Foundations and Techniques, Forth Edition, Philadelphia: FA Davis Company.

Magee, D. (2002). Orthopaedic Physical Assessment, 4th Edition, Philadelphia: Saunders

Rattray, F. and Ludwig, L. (2000). Clinical Massage Therapy: Understanding, Assessing and Treating over 70 Conditions, Elora: Talus Incorporated

Souza, T A (2005). Differential Diagnosis and Management for the Chiropractor. Protocols and Algorithms, 3rd Edition, Sudbury: Jones & Bartlett Publishers