

CASE REPORT: A RARE CASE OF SINDING LARSEN-JOHANSSON SYNDROME IN ADULT

Mohamad Azwan Aziz*, Dayyinah Radzi, and Redzal Abu Hanifah

Sports Medicine Unit, Hospital Queen Elizabeth, Malaysian Ministry of Health,
Kota Kinabalu, 88100, Sabah, Malaysia

*Email: kassemkoya69@gmail.com

(Received 6 August 2019; accepted 25 February 2020; published online 30 July 2020)

To cite this article: Aziz, M. A., Radzi, D., & Abu Hanifah, R. (2020). Case report: A rare case of Sinding Larsen-Johansson syndrome in adult. *Malaysian Journal of Movement, Health & Exercise*, 9(2), 17-23. <https://doi.org/10.15282/mohe.v9i2.415>
Link to this article: <https://doi.org/10.15282/mohe.v9i2.415>

Abstract

Sinding Larsen-Johansson syndrome is an osteochondrosis injury of the patella commonly seen in adolescents (between 10 to 14 years old). This case report covers an interesting case of Sinding Larsen-Johansson syndrome reported in a 33-year-old football athlete. He had been actively participating in many football tournaments for the last 18 years. He presented with anterior knee pain 1 month after experiencing a traumatic sports injury in one of his football matches. He was diagnosed with complete anterior cruciate ligament rupture, with medial and lateral meniscus injury. MRI confirmed the diagnosis with an additional finding of chronic Sinding Larsen-Johansson syndrome. He did not compete in further football matches, and underwent intensive physiotherapy focusing on eccentric muscle strengthening exercise. His anterior knee pain improved as well as his knee stability. This article will discuss Sinding Larsen-Johansson Syndrome in detail.

Keywords: Sinding Larsen Johansson Syndrome, traction apophysitis, anterior knee pain

Introduction

Anterior knee pain is one of the most common complaints reported by athletes. Anterior knee pain carries many differential diagnoses, and so distinguishing them would be a challenge to clinicians. One of the differentials rarely encountered in adults is Sinding Larsen-Johansson syndrome, which is an overuse injury. It is often described in the active adolescent age group, between 10 to 14 years old, most commonly in males active in jumping sports (Valentino & Quiligotti, 2012; Iwamoto, Takeda, Sato, & Matsumoto, 2009; Peace, Lee, & Healy, 2006). The incidence of Sinding Larsen-Johansson

syndrome in adolescence is around 2% to 5%. However, to the author's knowledge, it is rarely reported in adults (Malherbe, 2019).

The aim of this study is to report a rare occurrence of Sinding Larsen-Johansson syndrome in a 33-year-old football athlete.

Case Report

We would like to report a case of Sinding Larsen-Johansson syndrome in a 33-year-old football athlete who presented to the Sports Medicine unit of Hospital Queen Elizabeth with right anterior knee pain for one month following a traumatic sports injury while playing football in 2018. He has been actively participating in many football tournaments for the last 18 years which included local and state football tournaments. He currently trains by having friendly football matches on every weekend. During his adolescence, he would play friendly football matches almost every day. He experienced frequent recurrent left knee injuries associated with pain and swelling for the past 18 years. A major one occurred in 2017 when he was diagnosed with chronic anterior cruciate ligament (ACL) tear of his left knee by Magnetic Resonance Imaging (MRI). He was unable to recall any history of right knee pain or injury. He underwent intensive sports rehabilitation for one year. After completing it, he was able to participate in football tournaments.

At the end of 2018, he complained of right anterior knee pain for one month, which occurred after football matches but resolves with rest, and not associated with swelling. However, he never sought medical attention for it. He suffered another traumatic sports injury over his right knee in December 2018 when he was tackled from the side and twisted his right knee. He had right knee pain and swelling following the trauma, which he treated with ice therapy and rest. He came to sports medicine clinic two months after the injury. Upon assessment in the sports medicine clinic, there was minimal right knee joint swelling associated with an increase in the surrounding temperature. However, there was no anterior knee swelling. Specific tenderness could be elicited at the medial and lateral joint lines as well as at the inferior pole of the patella. The right knee's range of motion was full. The right quadriceps strength was slightly reduced compared to the left side. Special tests were done on the right knee including the anterior drawer and mc Murray's test, both of which were positive. Provisional diagnosis of complete anterior cruciate ligament tear with meniscus injury was derived after assessment; thus, he underwent an MRI examination of his right knee.

The MRI of the right knee confirmed the diagnosis of complete ACL tear, with the addition of medial and lateral menisci tears. There was an incidental finding of thickening of the proximal patella tendon with enthesophytes at the inferior pole aspect of the patella, with two foci of ossification suggestive of Sinding Larsen-Johansson syndrome. Moreover, there was also ossification at insertion of the distal quadriceps tendon.

He rested from football since the injury. He was prescribed with NSAIDs and intensive physiotherapy, as he refused surgical intervention. The therapy involved strengthening exercises of the quadriceps and hamstring muscles, focusing more on eccentric muscle strengthening but not neglecting balancing. After 12 weeks of intensive physiotherapy, he denied any anterior knee pain, and the instability of his right knee was improving. He was started on slow jogs on a treadmill.

Discussion

The continuum of disease in adolescence involving inferior pole of patella and proximal patella tendon includes Sinding Larsen-Johansson syndrome, patella sleeve fracture and jumper’s knee. However, in adult age group, Sinding Larsen-Johansson syndrome and patella sleeve fracture are not commonly seen. Sinding Larsen-Johansson syndrome was first described by Chr (1921). It is due to repetitive injuries and overstrain leading to inflammatory process over proximal patella tendon. This disease is often reported in active adolescents and has been related to traction apophysitis. The apophysis is where the ligament or tendon inserts onto the bone. The Sinding Larsen-Johansson syndrome is an osteochondrosis of the inferior pole of the patella, which commonly occur due to repetitive microtrauma or contraction of the muscle which results in detachment of the ossification centre at the proximal patella tendon, similar to Osgood-Schlatter Syndrome (Tibial Tuberosity) (Malherbe, 2019). Tibial apophysis fuses around the age of 18, while the proximal apophysis fuses later at during 20s (Ryan, 2010). It is different from the pathogenesis of jumper’s knee. Although both Sinding Larsen-Johansson syndrome and jumper’s knee are overuse injuries, jumper’s knee injury does not involve the ossification centre as in Table 1. In this case, he most probably had patella tendinopathy with underlying Sinding Larsen-Johansson syndrome.

Table 1: Difference between Sinding Larsen Johanssen syndrome, jumper’s knee and patella sleeve fracture (Alasaff, 2018; Malherbe, 2019; Mahomed et al., 2012).

	Sinding Larsen Johanssen syndrome	Jumper’s knee	Patella sleeve fracture
Pathophysiology	Traction apophysis	Repeated strain, micro-tears as well as collagen degeneration may occur in the tendon leading to patellar tendinopathy, does not involve ossification centre	Chondral or osteochondral avulsion injury commonly at the inferior pole of the patella
Prevalence	Adolescent age group	Adult age group	Adolescent age group
Characteristic	Proximal patella tendinopathy with presence of bone oedema	Chronic degeneration of patella tendon due to tearing	Avulsed small bony fragment with cartilage

Making a proper diagnosis in an athlete presenting with anterior knee pain is challenging. Isolated anterior knee pain suggests involvement of the patella, patellar tendon, or its

attachments. Good history taking would guide clinicians towards proper diagnoses. Insidious onset of anterior knee pain in adolescents during rapid growth periods with concomitant overuse suggests Osgood-Schlatter disease (tibial apophysitis) or Sinding Larsen-Johansson syndrome (distal patellar apophysitis). Gorman McNerney & Arendt (2013) summarized the differentials of anterior knee pain in athletes (Table 2).

Iwamoto et al. (2009) described 4 radiological stages of Sinding Larsen-Johansson syndrome:

Stage 1: Normal findings.

Stage 2: Irregular calcifications at the inferior patellar pole.

Stage 3: Coalescence of calcifications.

Stage 4A: Incorporation of calcifications into patella.

Stage 4B: Coalesced calcified mass separate from the patella

Ultrasound is the best modality to diagnose Sinding Larsen-Johansson syndrome in athletes presenting with anterior knee pain. The thickening of the patellar tendon, with calcifications in the advanced stages, as well as fragmentation of the lower pole of the patella and bursitis affecting a serous bursa situated between the patellar tendon and the patella, can often be visualised through ultrasound (Valentino & Quiligotti, 2012; Iwamoto et al., 2009; Peace et al., 2006; Malherbe, 2019). On MRI, T1 sequence will demonstrate hypointense image at inferior pole of the patella, proximal patella tendon and surrounding soft tissue, and hyperintensity of the image is seen T2- weighted MRI (Schubert et al., 2019).

Sinding Larsen-Johansson syndrome often responds well to conservative management (Malherbe, 2019; Alassaf, 2018; & Zarogianni, 2007). A systematic review on rehabilitation of patella tendinopathy as used in this case recommends rest, NSAIDS, modification of training intensity, and strengthening program of quadriceps focusing more on eccentric muscle strengthening program which was done during our athlete's 12 weeks of intensive physiotherapy (Morgan, Janse van Vuuren, & Coetzee, 2016). Surgical debridement, which will remove the necrotic intratendinous tissue should be the last resort for patients who are resistant to conservative management (Zarogianni, 2007).

Table 2: Differential diagnosis of anterior knee pain

Categories	Disease
Apophyseal	Osgood-Schlatter disease Sinding Larsen-Johansson Syndrome
Bone and Cartilage	Articular cartilage injury Bone tumour Loose Bodies Osteochondritis Dissecans Patella instability/subluxation Patella stress fracture Symptomatic Bipartite Patella
Inflammation	Septic arthritis Bursitis Rheumatology disorder
Muscle/ tendon	Quadriceps tendinopathy Patella tendinopathy
Nerve	Complex regional pain syndrome Neuroma Saphenous neuritis
Soft Tissue	Hoffa disease Iliotibial band Patella instability Pes Anserinus bursitis Prepatellar bursitis
Synovium	Plica synovitis

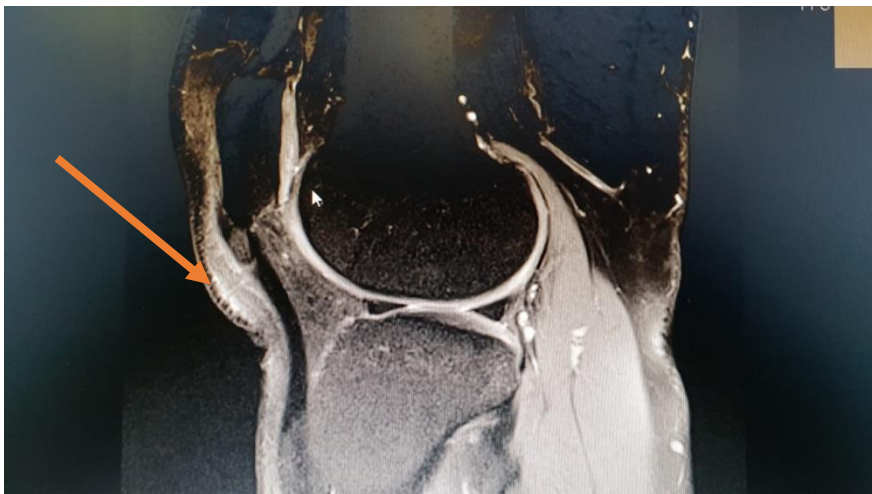


Figure 1: MRI T2 weighted image of right knee.



Figure 2: MRI T1 weighted image of right knee.

Conclusion

This a worthy case to be reported, as clinicians should consider this disease if an athlete presents with anterior knee pain and calcifications at the inferior pole of the patella. The best modality to diagnose Sinding Larsen-Johansson syndrome would be ultrasound, as it is cost effective and emits less radiation. The disease often responds very well with modification of training and good quadriceps strengthening programs.

Acknowledgement

We would like to thank the Director General of Health Malaysia for his permission to publish this article.

References

- Alassaf, N. (2018). Acute presentation of Sinding-Larsen-Johansson disease simulating patella sleeve fracture: A case report. *SAGE Open Medical Case Reports*, 6, 2050313X1879924. <https://doi.org/10.1177/2050313X18799242>
- Chr. M. F. Sinding-Larsen (1921). A Hitherto Unknown Affection of the Patella in Children. *Acta Radiologica*, 1(2), 171-173. <https://doi.org/10.3109/00016922109132957>
- Gorman Mc Nerney, M. L., & Arendt, E. A. (2013). Anterior Knee Pain in the Active and Athletic Adolescent. *Current Sports Medicine Reports*, 12(6), 404–410. <https://doi.org/10.1249/JSR.0000000000000013>

- Iwamoto, J., Takeda, T., Sato, Y., & Matsumoto, H. (2009). Radiographic abnormalities of the inferior pole of the patella in juvenile athletes. *Keio Journal of Medicine*, 58(1), 50-3. <https://doi.org/10.2302/kjm.58.50>
- Malherbe, K. (2019). Traction apophysitis of the knee: A case report. *Radiology Case Reports*, 14(1), 18–21. <https://doi.org/10.2302/kjm.58.50>
- Morgan, S., Janse van Vuuren, E. C., & Coetzee, F. F. (2016). *Causative factors and rehabilitation of patellar tendinopathy: A systematic review. South African Journal of Physiotherapy*, 72(1). <https://doi.org/10.4102/sajp.v72i1.338>
- Mahomed, N., Kuehnast, M., & Mistry, B. (2012). *Sinding-Larsen-Johansson syndrome. South African Journal of Child Health*, 6(3). <https://doi.org/10.7196/sajch.423>
- Peace, K. A., Lee, J. C., & Healy, J. (2006). Imaging the infrapatellar tendon in the elite athlete. *Clinical Radiology*, 61(7), 570-578. <https://doi.org/10.1016/j.crad.2006.02.005>
- Ryan, S., McNicholas, M., & Eustace, S. (2010). *Anatomy for Diagnostic Imaging. Saunders Ltd. 3rd Edition.*
- Schubert R, Gaillard F, et al. Sinding-Larsen-Johansson disease. <http://Radiopaedia.org/articles/sinding-larsen-johansson-disease> (accessed 16 July 2019).
- Valentino, M., & Quiligotti, C. R. M. (2012). Sinding-Larsen-Johansson syndrome: a case report. *Journal of Ultrasound*, 15, 127–129. <https://doi.org/10.1016/j.jus.2012.03.001>
- Zarogianni, C. (2007). Sinding-Larsen Johanssen Syndrome - Case Report. *Journal of Orthopaedics*, 4(4)e4.