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A Vast-us Differential on Knee Pain

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History

12 year-old male football player presents to the sports clinic for evaluation of 1.5 years of left lateral knee pain. There is no acute injury or mechanism recalled. Pain began at the end of the football season without a specific injury event. He notes moderate pain (6/10 pain score) that occurs intermittently, is aching/cramping in quality and unchanging since it began 1.5 years ago. He is able to bear weight on the knee, however, it is worse with walking, prolonged sitting, and after karate. Ice, over-the-counter non-steroidal anti-inflammatories, and immobilizations help. There has been no swelling, bruising, catching, locking, or buckling. Prior treatments included evaluation by primary care physician and X-ray without abnormal findings. A twelve system review of systems is negative. He has no significant past medical history.

Physical Exam

HT: 63 inches Weight: 130 lbs BMI: 23.03

BP: 122/80 Pulse: 93

Well appearing, in no acute distress. No limp. No genu valgum/varus of bilateral knees.

Reflexes are 2/4, sensation is normal and skin appears normal.

No bony tenderness of BL knees. Non-tender over tibial tubercle.

There is tenderness to palpation of the left quadriceps tendon, vastus lateralis area.

Range of motion is full and within normal limits. Passive stretch of quadriceps is symmetric and non-tender.

No patellar apprehension. Negative patellar grind. Negative Lachman test. Negative McMurray test.

5/5 quadriceps strength bilaterally. Pain in region of vastus laterals portion of quadriceps tendon with resisted strength testing.



Figure 1. XR on initial exam. Left to right: Left knee AP; Left PA flex; Left lateral.

Differential Diagnosis

- #1 Quadriceps strain
- #2 Suprapatellar fat pad impingement
- #3 Patellofemoral pain syndrome
- #4 Osteochondritis dessicans lesion
- #5 Intramuscular cyst

Tests & Results Review

XR showed fragmentation of tibial tubercle (which can be a normal variant at this age) on lateral view and no sign of osteochondritis lesion. He started formal physical therapy. Follow-up in 5 weeks showed minimal improvement of left anterior/lateral knee pain (5/10 pain score) and unchanged physical exam aside from decreased quadriceps flexion. MRI w/o contrast of left knee was ordered and revealed a 2.5 cm multi-loculated lesion centered within the distal aspect of vastus intermedius muscle that could be a ganglion associated with the adjacent tendon or joint capsule. The patient was referred to orthopaedic surgery for excision of the soft tissue lesion.

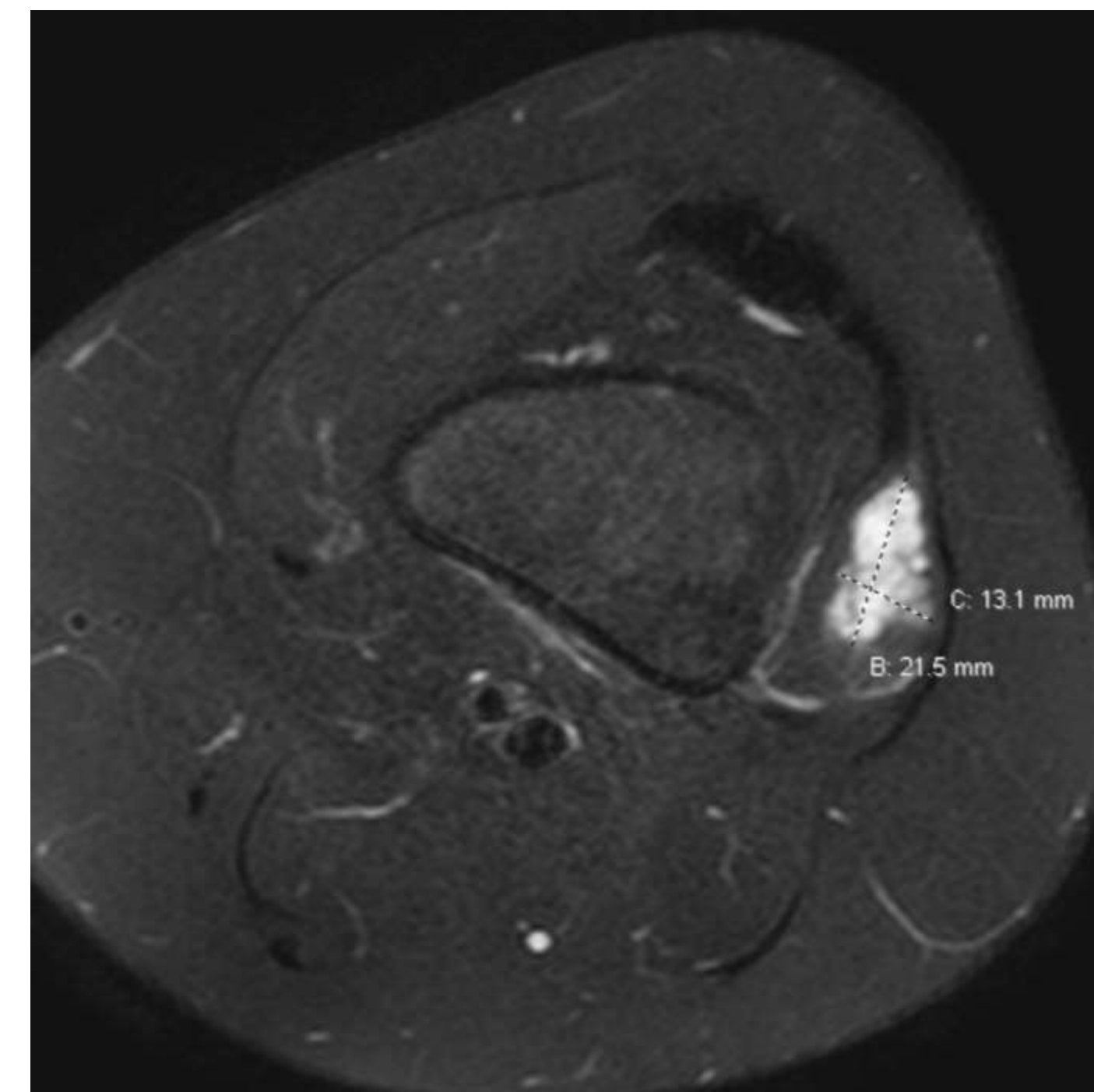


Figure 2. Left AX T2 FS MRI (top); Left COR PD FS MRI (bottom)

Results Continued

The pathology report on the excised tissue revealed a 5.8 x 4.3 x 2.7 cm aggregate of yellow-tan to red-brown, ragged and irregular shape portions of soft tissue and skeletal muscle. No obvious mass was readily recognized in the ragged fragments, which were glistening and focally hemorrhagic. There were fragments of skeletal muscle, adipose and fibrovascular tissue with no evidence of malignancy.

Final Working Diagnosis

Intramuscular hemangioma

Discussion

Skeletal muscle hemangiomas are uncommon soft tissue tumors.

They are seen most frequently in infancy and childhood but can also be seen in adults. They can be intramuscular or synovial. As a deep intramuscular mass it can have cystic, dilated blood-filled spaces. About 60% of intramuscular hemangiomas present with pain, more often in long and narrow bones [4]. Pain is often worse with exercise of the involved muscle due to vascular dilation, increased regional blood flow, followed by subsequent swelling and compressive pain. On average patients present after over one year of pain [3].

Other possible clinical findings of intramuscular hemangioma include isolated pulsations, extremity enlargement when dependent (and regression when elevated), compressibility, increased temperature, muscle contracture, tenderness to palpation, and muscle weakness. Larger and/or superficial hemangiomas may be associated with lower extremity deformities, skin discoloration, bruit, or pulsation [3].

X-Ray can show an area of increased density or be normal. Magnetic resonance imaging can better characterize the extent of the hemangioma and its appearance and is the imaging modality of choice. It is generally a benign lesion that is classic in appearance on MRI. There are many treatment modalities for symptomatic hemangiomas, surgical excision being the most preferred [1, 2]. Given the symptomatology for the patient it was appropriate in his case for excision.

Management/Outcome

5.5 weeks post-excision the patient presented with 3/10 pain, 4/5 strength and difficulty with active full extension of the left knee. Knee flexion was limited to 115° compared to 140° on the right. He was started in formal physical therapy. Ten days later the patient presented for an acute injury in which he fell with forced flexion of the left knee, experiencing the sensation of a "pop." Pain at that time was determined to be due to pulling of the deep tissue sutures and quadriceps strain. He continued formal physical therapy. He followed up in 2.5 weeks with improving pain, limp and trace effusion.

At 6 week follow-up, or 4 months from surgery, he was completely symptom free. He was cleared to return to full activities at that time and was instructed to follow up as needed. Phone follow up with the patient's parents several weeks later revealed the patient was doing well, back to full activities, and was pain-free.

References

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3. Wierzbicki JM, Henderson JH, Scarborough MT, Bush CH, Reith JD, Clugston JR. Intramuscular hemangiomas. *Sports Health*. 2013;5(5):448-454.
4. Wild AT, Raab P, Krauspe R. Hemangioma of skeletal muscle. *Arch Orthop Trauma Surg*. 2000; 120(3-4):139-43.