A 46-year-old man presented to the Emergency Department (ED) with left knee pain after being assaulted and landing on a flexed knee. On physical examination, the patient had a large effusion of his left knee and the patella was retracted proximally. He was unable to bear weight on his left leg, range his knee, or hold his leg up against gravity due to pain. The left extremity was neurovasculary intact. X-ray studies of the knee and femur showed infrapatellar soft tissue swelling but no fracture.

A disruption of the extensor mechanism of the knee was suspected, but due to patient discomfort, could not be certainly diagnosed. An ultrasound scan was performed by the emergency physician to evaluate for patellar tendon disruption. It demonstrated a hypoechoic area within the proximal patellar tendon that transversed the entire tendon. Dynamic ultrasound performed while the knee was passively flexed showed a separation of the proximal and distal parts of the patellar tendon with anechoic fluid filling the gap. These findings were consistent with a complete patellar tendon rupture, and Orthopedic Surgery was consulted. Surgery was recommended, and in the operating room, the patella tendon was found to be ruptured near the insertion site on the inferior pole of the patella. After surgical repair, the patient was placed in a straight leg cylinder cast and successfully completed a long course of rehabilitation.

DISCUSSION

The patella tendon originates at the inferior pole of the patella and inserts at the tibial tuberosity. The patella tendon is critical for knee extension along with the quadriceps, medial and lateral retinaculum, and tibia. Patella tendon ruptures often occur at the inferior pole of the patella because this is the site of origin (1). Ruptures of the patella tendon are rare, as the tendon is able to handle very high tensile loads. Rupture requires a force of 17.5 times body weight in a healthy adult (2). Risk for rupture increases in chronic medical conditions such as hyperparathyroidism, rheumatoid arthritis, immunosuppression, systemic lupus erythematosus, and with the use of steroids and fluoroquinolones (3–6). Patella tendon ruptures are more common in patients < 40 years old participating in athletics where the extensor mechanism is overloaded (7).

Patients with patella tendon rupture present with sudden onset of pain, swelling, a high-riding patella, and inability to actively extend the leg (1). Diagnosis can be made by physical examination if a complete rupture is present. However, even in complete ruptures, some retinacular fibers may still be intact, allowing extension of the knee (8). In these cases, and in partial tendon ruptures, additional imaging is needed—including radiographs,
ultrasound, or magnetic resonance imaging (MRI). An anteroposterior and lateral radiograph should be obtained and will demonstrate a high-riding patella as seen in Figure 1 (9). Radiographs also effectively rule out fracture. MRI can be used for diagnosing patella tendon ruptures; however, MRI is not often used in the ED setting due to high cost, lack of availability, and length of time to complete the imaging (10). Ultrasound has proven to be useful in the diagnosis of patella tendon rupture. If a complete rupture is present, hypoechogenicity will be seen over the entire thickness of the tendon, as in Figure 2 (6). Dynamic ultrasound is even more useful in a complete rupture, showing the two tendon ends separating from each other with echogenic or echolucent fluid filling the space as in Video 1 (11). In partial tendon ruptures, a linear hypoechoic line is seen extending through the tendon that may have wedge-shaped separation on dynamic ultrasound with knee flexion (12). Emergency physicians have demonstrated the ability to accurately diagnose tendon ruptures in other parts of the body (13).

Treatment for a ruptured patella tendon is surgical reattachment. Quick diagnosis and prompt surgical treatment greatly improves patient outcomes (9). Furthermore, delays in surgical repair lead to scar tissue formation (14). Nonsurgical management with knee immobilization is not effective for full rupture (6). Surgical repair is required to reestablish the extensor mechanisms of the knee (15). However, if only a partial patellar tendon tear is present, the treatment of choice is knee immobilization in full extension for 4–6 weeks (16). After surgery, patients are placed in a long leg cast for knee immobilization. Eventually, range-of-motion and weight-bearing exercises are implemented (6).

REFERENCES

Streaming video: One brief real-time video clip that accompanies this article is available in streaming video at www.journals.elsevierhealth.com/periodicals/jem. Click on Video Clip 1.

**SUPPLEMENTARY DATA**

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jemermed.2014.02.012.