

General

Patella Baja with Complete Quadriceps Tendon Rupture

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Patella baja is an uncommon yet dangerous condition primarily found in patients who have received knee surgery, but can occur in anyone, more commonly in overweight, middle-aged males. The case presented outlines an instance in which a man with no previous history of knee injury or surgery, yet with other high-risk factors, develops patella baja after a minor injury. The case highlights the importance of testing and awareness of such conditions. The case report outlines the cause, diagnosis, and treatment of the patient's condition.

INTRODUCTION

Patella baja is a rare condition in which the patella, or kneecap, rests at an abnormally low height, as can be diagnosed through radiographs. This is determined by the Caton-Deschamps Index (CDI), in which the ratio is measured from the distance from the inferior tip of the patella to the anterosuperior angle of tibia, and the length of the patellar articular surface. If the CDI is between 0.8 and 0.6, it is considered low, and if the CDI is below 0.6, the patient is strongly considered to have patella baja.¹ True patella baja occurs only when the length of the patellar tendon is shortened, while pseudo-patella baja (PPB) can occur without the shortening of the patellar tendon.² Both conditions have similar causes and results.

Patella baja is most commonly caused by postoperative inadequate knee motion, immobilization, knee-related trauma, or the over-distalization of the patellar tendon during surgical procedures affecting the knee.³⁻⁵ These surgical procedures include tibial osteotomy, total knee arthroplasty (TKA), patellar tendon reconstruction, or any surgery related to the knee.^{3,5,6} This can result in weakness or pain in the knee as well as a more limited range of knee motion due to the misplacement of the patella.³ This condition is reportedly seen more often in men than women, and in either case, more common in middle aged adults.⁷ Another risk factor of patella baja is body mass, as patients with higher body masses are more likely to have preoperative patella baja as compared to those of normal weight. With each additional 10 pounds of weight, 60-90 pounds is transmitted through the knees with ambulation. This amount of force increases and shifts anteriorly to the knees extensor mechanism when ambulating down a decline ([Figure 1](#)).^{8,9}

Due to the shortening of the patellar tendon in true patella baja, treatments include the lengthening or reconstruction of the patellar tendon through autographs or allografts.^{10,11} Although these procedures are difficult and not commonly performed, they typically tend to yield positive, effective results. However, patella baja can be commonly

confused with pseudo-patella baja due to their similar appearances and overall nature, in which case lengthening or reconstruction of the patellar tendon would not be necessary. Overall, although cases are rare, patella baja is a serious condition that can lead to long-term pain and decrease in motor function if not properly treated in a timely manner.

CASE PRESENTATION

A 57-year-old male veteran with no notable past medical history arrived at the emergency room after falling on his knee and hearing a pop.

The patient denied feeling any abdominal or chest pain, any numbness or tingling in the left lower extremity, skin rashes or lesions, or any other abnormality apart from exquisite pain in the left knee. Except for blood pressure which was elevated at 193/102 mmHg, vital signs were within normal limits, with a temperature of 98.6°F, pulse 92, respiratory rate 19 breaths/minute, and pulse oximetry 99% on room air.

MRI scan revealed a complete quadriceps tendon rupture with associated patella baja. Also seen was a grade 2 sprain of the medial collateral ligament., and Class 2-3 chondromalacia in the medial patellar facet. The markup displays the position of the patella along with the CDI ratio of less than 0.6 which determines patella baja in this patient ([Figure 2](#)).

The on-call orthopedic surgeon was consulted, and the plan was to admit the patient for surgery the next day. After discharge, he was to wear a brace for four weeks, followed by four to six months of physical therapy. He agreed to the plan and was later taken to the operating room. There, he was administered anesthesia and antibiotics, and a tourniquet was placed high on his thigh. A midline incision was created from his patella to the tibial tuberosity, revealing a completely torn quadriceps tendon off the proximal pole of the patella. The torn ends of the quadriceps tendon and the

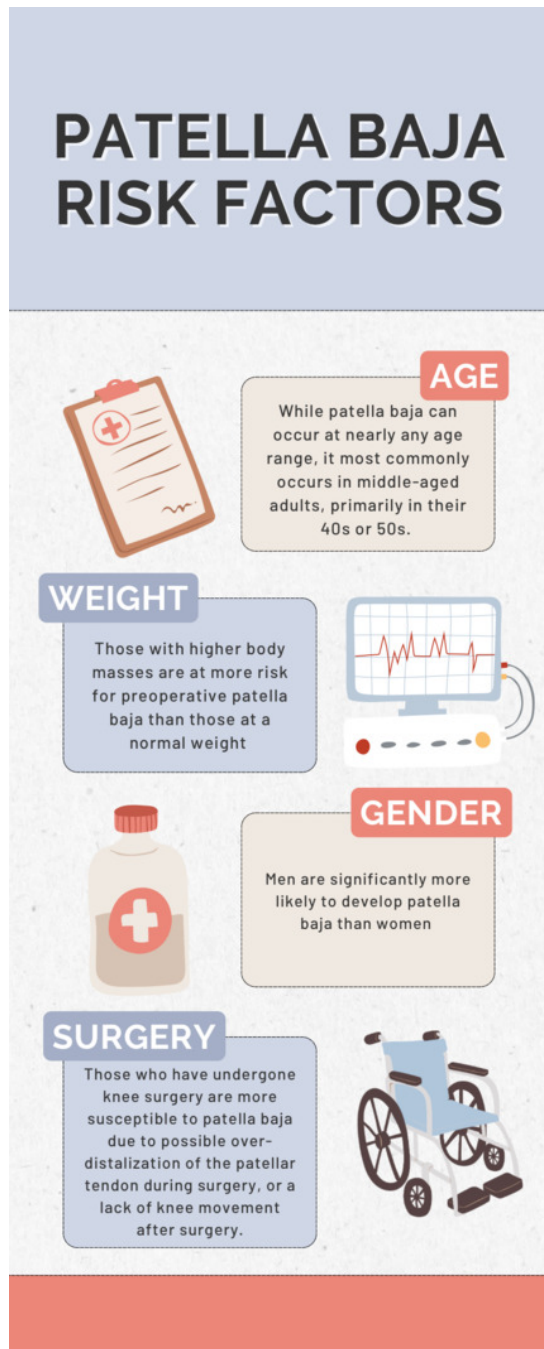


Figure 1. Risk Factors of Patella Baja

remnant on the patella were debrided back to healthy tissue. The procedure was able to properly restore his patella and injured tendon.

DISCUSSION

Patella-baja may should remain on the differential after minor innocuous appearing injuries or even spontaneously if pain and limitation of function heighten clinical suspicion. This case is unusual because the patient had no pertinent medical history relating to his diagnosis, including prior knee surgeries, which are common precursors to patella baja. However, as a 57-year-old male, he had risk factors that he might have been unaware of. This under-

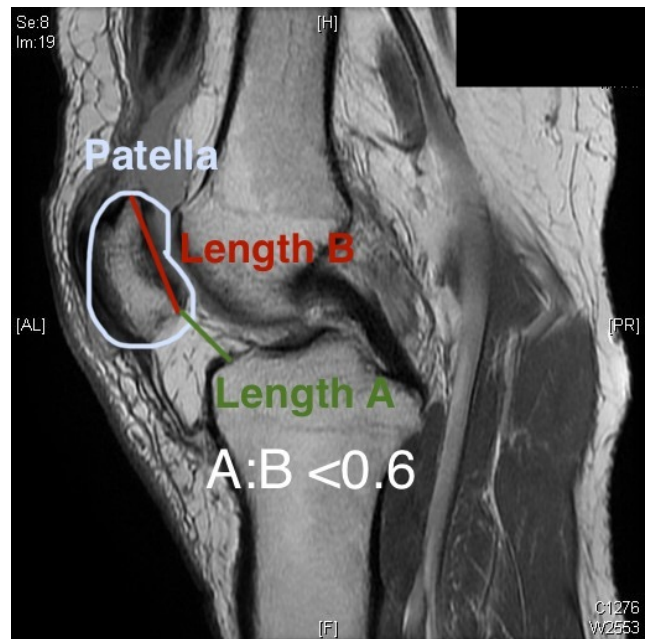


Figure 2. MRI Scan of Patella Baja depicting a CDI ratio less than 0.6

scores the importance of awareness about patella baja, as patients might dismiss it as a minor injury, leading to potential worsening of the condition and knee damage over time. Overlooking symptoms of pain would have only worsened the condition and caused more damage to the patient's knee over time, as opposed to obtaining an MRI scan and properly confirming the diagnosis of patella baja, allowing him to receive the proper treatment.

Due to how uncommon patella baja is, it is incredibly likely that many people who are at high risk of developing it may not even be aware of the condition's existence, and thus may not regard any existing symptoms with the proper importance. This can cause a lack of lower extremity function and an increase in pain among patients who were simply unaware of the severity of their injury. Awareness in different types of medical complications that can arise from everyday injuries is vital in ensuring that patients take the proper measures to ensure that their injuries are adequately treated and not dismissed as unimportant.

As depicted in this case, surgery on the patella is one of the primary treatments for patella baja in order to properly restore the position of the patella and surrounding tendons. There are various surgical procedures that can treat patella baja, including a tenotomy, tibial tubercle transfer, Z-plasty procedure, or other tendon lengthening procedures.^{3,10,12} Given the rarity of this condition, no single procedure has been universally recognized as the superior treatment, as each has its benefits and limitations depending on the individual patient. This emphasizes the need for further research on patella baja so that a standard effective medical procedure can be developed, as none exists yet. Additional research and medical attention on patella baja is imperative in helping patients undergo proper treatment and recovery, which may be overlooked due to the lack of cases. While patella baja may not be a common condition,

it is dangerous if improperly treated. In any case, a crucial step after the procedure is physical therapy and mobilization of the lower extremities in order to reduce the likelihood of patella baja recurrence in patients.³

CONCLUSION

Although patella baja is most commonly found in patients who have undergone knee surgery, patella baja can occur

in any patient, especially in middle-aged, overweight men. Routine MRI screening, as well as taking immediate action upon experiencing a painful injury, is important in order to diagnose and treat patella baja as effectively as possible. This case highlights how seemingly normal injuries, such as hurting one's knee in this case, can lead to much more severe, serious medical issues that require immediate and serious attention.

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