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Late reconstruction of the patellar tendon in rheumatoid arthritis using bone-patellar tendon-bone allograft



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ABSTRACT

INTRODUCTION: chronic patellar tendon rupture is rare and its incidence and prevalence are unknown. Furthermore, the data about late reconstruction of the patellar tendon in rheumatoid arthritis is limited. Such condition, if not managed properly, can substantially affect the patient's activities of daily living.

CASE PRESENTATION: We report a case of chronic patellar tendon rupture in a 49 years old lady who has been suffering from rheumatoid arthritis for over 20 years. She presented with an inability to extend the right knee which started suddenly a year and a half ago without any history of trauma. She underwent reconstruction of the patellar tendon using a massive BTB allograft. Three years after surgery, the patient had an active range of motion between -20 and 120° and was walking normally without any external support.

DISCUSSION: When the primary repair of the patellar tendon is not possible, it is necessary to either repair with autologous augmentation or use a graft to reconstruct the tendon. We believe autografts may not be suitable in the presence of rheumatoid arthritis since the disease is associated with excessive levels of collagenase that could contribute to the degeneration of the tendons.

CONCLUSION: Late patellar tendon reconstruction in rheumatoid arthritis is a challenging procedure, and we believe it is best performed using an allograft to achieve the desired outcome.

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1. Introduction

Rheumatoid arthritis is a systemic disease that has a wide range of burdening symptoms especially on the long term [1]. The disease has been linked to tendons impairment due to either its progression or the treatment used to control the symptoms [2,3]. Although it is rare, the patellar tendon, for instance, is prone to spontaneous rupture in rheumatoid arthritis [4]. This can substantially affect a patient's life through the loss of the knee extensor mechanism [5].

There are various options to manage patellar tendon ruptures. They include primary repairs with or without tendon augmentation or reconstruction using different types of autografts or allografts. Each technique has its pros and cons and the decision should be made according to the pattern and duration of injury along with other influential factors such as the patient's status [6–8].

After extensive review of the literature, it was evident that chronic patellar tendon rupture is rare and its incidence and prevalence are unknown [9,10]. We also noticed the scarce data about the

late patellar tendon reconstruction in rheumatoid arthritis. Thus, we present the results of a late reconstruction of a patellar tendon using a bone-tendon-bone (BTB) allograft in a lady with rheumatoid arthritis.

2. Case report

We report a case of chronic patellar tendon rupture in a 49 years old female patient who has been suffering from rheumatoid arthritis for over 20 years and was on a long-term therapy with corticosteroids and methotrexate. She came to our hospital complaining of her inability to extend the right knee which started suddenly a year and a half ago without any history of trauma. The reason behind the delayed presentation is that she had been managed in another hospital using different kinds of orthotics. Clinical examination showed a high riding patella along with a gap in the patellar tendon area. A magnetic resonance imaging (MRI) was done and it showed a complete rupture of the patellar tendon (Fig. 1).

After seven months from the patient's presentation to our hospital, she underwent reconstruction of the patellar tendon using a massive BTB allograft. Prophylactic antibiotics were administered

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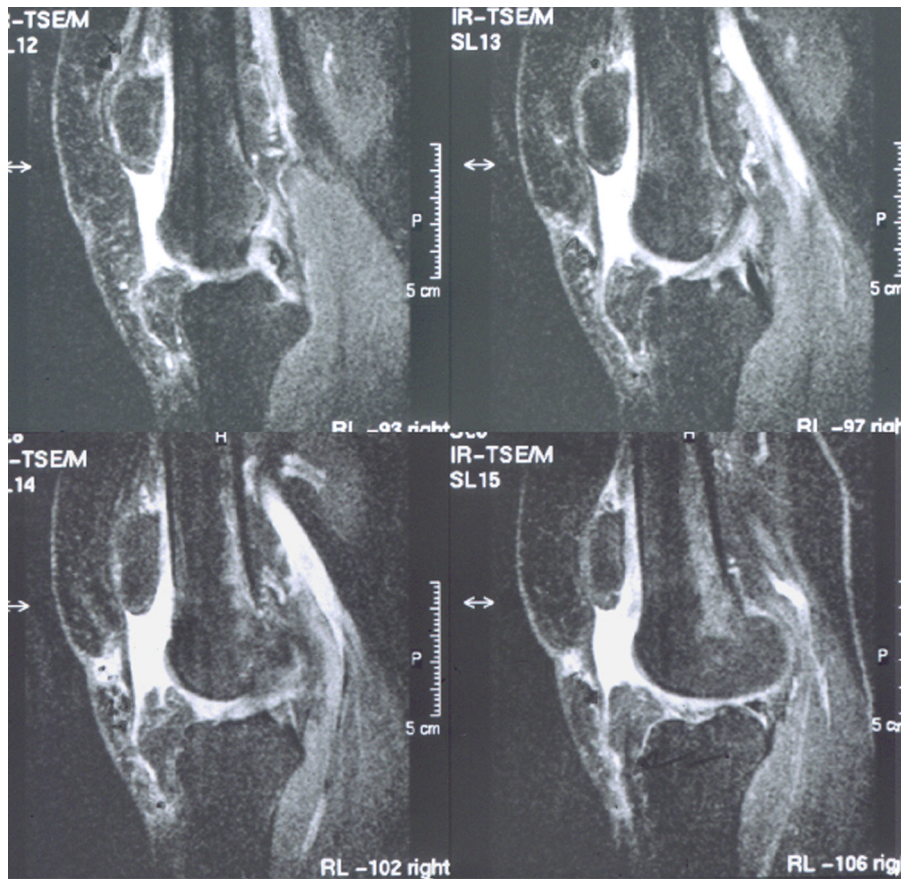


Fig. 1. Multiple sagittal MRI views showing the complete patellar tendon rupture and the patella alta.

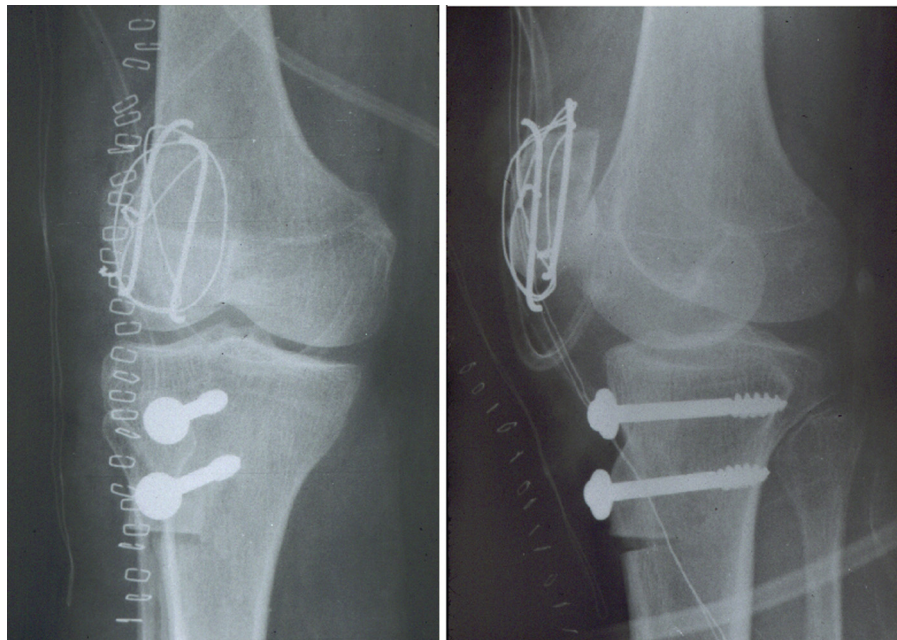


Fig. 2. Postoperative x-ray images showing the fixation using two k-wires, tension band and two screws.

prior to surgery and the patient was put under general anesthesia with an appropriate dose of muscle relaxant. While the patient was in a supine position with a tourniquet applied and a bump placed beneath the ipsilateral thigh, a midline longitudinal incision extending beyond the superior pole of the patella and distal to the

tibial tuberosity was made. The soft tissue was released to bring the retracted patella distally. The large bone block of the BTB allograft was fixed to the patella with two K-wires and a tension band in a similar technique to that used in the fixation of patellar fractures. After performing a tibial osteotomy to contain the distal bone block,

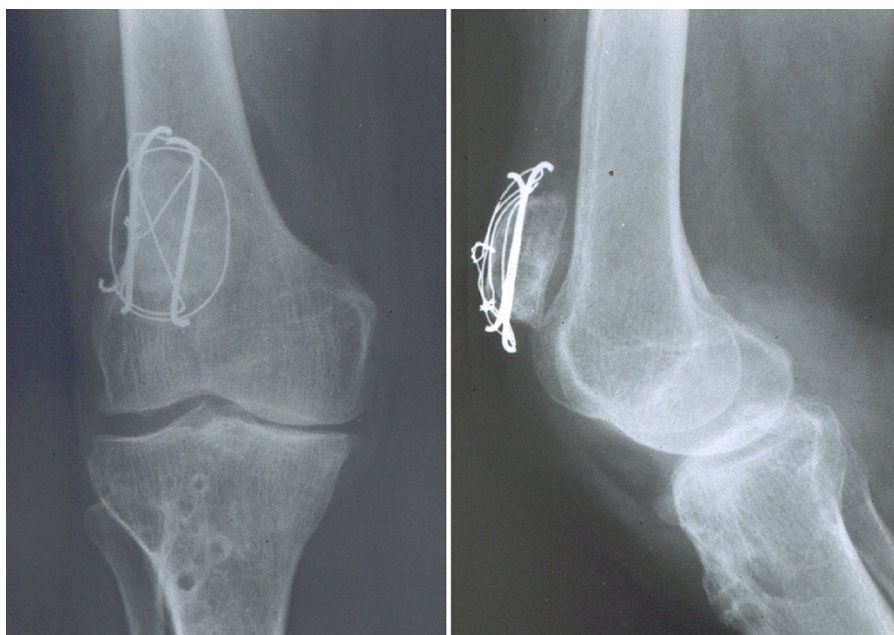


Fig. 3. The x-ray images after removing the screws demonstrating an adequate union.

the allograft was anchored to the tibia, more distal than usual, using two screws. The purpose of the distal placement was to utilize the graft which had a greater than ideal length while maintaining an optimal tension of the knee extensor mechanism. After closure, two views of plain radiographs were taken (Fig. 2). Early range of motion was allowed through a flexion-extension knee orthotic. Passive full extension and 30° of flexion were permitted. Partial weight bearing and active extension began three weeks after surgery. No complications were observed in the postoperative period. However, the two screws over the tibial tuberosity were removed after one year because of their prominence and x-ray images were taken afterwards showing an adequate union (Fig. 3).

Three years after surgery, the patient had active and passive range of motion between –20 and 120° and was walking normally without any external support (Figs. 4–5).

3. Discussion

When the primary repair of the patellar tendon is not possible, it is necessary to either repair with autologous augmentation or use a graft to reconstruct the tendon. There are various types of grafts and it is of a paramount importance to choose wisely. Despite their limited availability and higher risk of infection, synthetic allografts have been used in patellar tendon reconstruction [11,12]. Achilles tendon and BTB allografts have also been studied [12,13]. Several studies investigated the utilization of contralateral semitendinosus tendon with or without the gracilis tendon and BTB autografts with various success rates [7,9]. Nevertheless, we believe autografts may not be suitable in the presence of rheumatoid arthritis since the disease is associated with excessive levels of collagenase that are thought to contribute to the degeneration of the tendons [14]. In addition, systemic corticosteroids, which our patient was taking, are also risk factors for tendon rupture [3]. Thus, allografts are better options in patellar tendon reconstruction surgeries in cases that are similar to ours.

Late patellar tendon reconstruction surgeries are challenging to orthopedic surgeons since there is a need to restore the function of a weak extensor mechanism while managing the patella alta. It is very important to ensure that the tension on the graft is adequate. Otherwise, there will be a flexion deficit if the tension is excessive



Fig. 4. The patient with her knees actively flexed three years after surgery.

or inability to properly extend if the tension is insufficient [12]. The persistence of patella alta after surgery, as in our case, has been reported [7,15]. In this regard, it is advisable to assess the normal side through plain radiographs and to measure the patellar indices, such as the Insall-Salvati or Blackburn-Peel index, before the operation. This, along with a graft of an ideal length, would serve in restoring the normal height of the patella [8]. Another problem



Fig. 5. The patient while actively extending her right knee three years after the operation.

our patient faced is the excessive extension (-20°) which can be explained by the inappropriate length of the available allograft that had to be anchored distal to the ideal site of insertion.

4. Conclusion

Late patellar tendon reconstruction in rheumatoid arthritis is a challenging procedure, and we believe it is best performed using an allograft to achieve the desired outcome.

Conflict of interest

None.

Funding

None.

Ethical approval

NA.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Jesus Palencia: surgical intervention, data collection, drafting the manuscript.

Saud Alfayez: data collection and interpretation, writing and submitting the paper.

Ahmad Alshammri: data collection, literature review, manuscript editing.

Firas Serro: literature review, manuscript approval.

Hani Serhan: literature review, manuscript approval.

Abdulaziz Alomar: reviewing, editing and approving the final version of the paper.

Guarantor

Jesus Palencia.

Disclaimer

This version had been read and agreed upon by all the authors who also bear responsibility for it. The material presented is original and all authors agreed to their inclusion. This manuscript has neither been published nor submitted to another journal.

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