

Cobra tongue shaped allograft augmentation of neglected patellar tendon rupture

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International Journal of Science and Research Archive, 2024, 13(02), 2456–2459

Publication history: Received on 28 October 2024; revised on 04 December 2024; accepted on 07 December 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.13.2.2422>

Abstract

We present a case of neglected patellar tendon avulsion after failed fixation. During the reconstruction of this injury, the Achilles tendon-Calcaneal bone allograft was fashioned like a cobra bifid tongue, and used for augmentation. Distally fixed in bone sockets that were each secured with an interference screw. While proximally the allograft tendon was sutured to the quadriceps tendon. This unique configuration was used to provide bone to bone fixation over the tibial side and to maximize the surface area of augmentation.

Keywords: Knee extensor mechanism disruption; Chronic patellar tendon rupture; Patellar tendon reconstruction; Neglected patellar tendon rupture

1. Introduction

The tibial tendon is a pivotal part of the knee joint extensor mechanism function. Primary repair of a chronically ruptured tibial tendon may not be enough to address the problem, as it carries a high risk of failure, hence augmentation is a surgical technique that provides further strength to the repair to reduce the chances of re-rupture and failure of the repair 1.

2. Case presentation

Seventy-one years old female patient with osteoporosis (T score -3.1), sustained a patellar fracture which was treated surgically with cerclage wiring which has failed. The patient was very reluctant to get it re operated early. One year after the failed fixation the patient presented with 45 degrees of extension lag, with a palpable gap under the intact skin, at the level of the inferior pole of the patella, representing failure of the extensor mechanism at the attachment point of the patella tendon to the inferior pole of the patella (figure 1).

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Figure 1 lateral radiographic view of the injury

The patient was thoroughly explained and an informed consent was obtained for operation. Intra-operatively the patella was high riding proximally with scar tissue between the patella and the distal pole remnant fragment (attached to the patellar tendon). The superior migration of the patella was about five centimeters, while the knee is in 90-degrees of flexion. The scar tissue, that was filling the gap between inferior part of the patella and the patella tendon, was excised, and the patella tendon was sutured to the quadriceps tendon through two longitudinal 2.7 mm tunnels in the patella, reducing the patella down to trochlear engagement.

Augmentation of the extensor mechanism was performed using freeze-dried human Achilles tendon-Calcaneal bone allograft (figure 2).



Figure 2 Allograft after its bony components have been secured in the tibia

The bony part of the allograft was split cut with a saw, creating two bone plugs (each still in continuity with the Achilles tendon allograft). Each of the bony plugs down sized to 0.5 x 2.0 cm. Then the tendon split over its distal four centimeters, creating two split ends with a bone plug attached to each one.

Two convergent sockets created using tibial jig (from the anterior cruciate reconstruction set), to pass respective guide wires at 70 degrees, then each was drilled over with 0.7 cm cannulated drill, which was advanced 2.5 cm without breaching the joint.

Prepared bony plugs inserted in the prepared tibial sockets and each was secured with a 0.7 x 2.0 cm metal interference screws.

While the split side of the tendon had each of its attached bony plugs secured in the proximal tibia on each side of the tibial tuberosity, the proximal part of the Achilles tendon was sutured to the quadriceps tendon in full extension, using Ethibond continuous sutures (figure 3).



Figure 3 Allograft final position

After reconstruction the construct was tested by putting the knee at 90 degrees of flexion, a position that was achieved with ease, with the reconstruction able to maintain the extensor mechanism and patella reduced to trochlear engagement.

3. Discussion

Neglected patella tendon rupture is uncommon 1. There are many ways to address neglected ruptured patella tendon reconstruction. Such reconstruction can be done with tendon autograft or allograft 2. Reconstruction using hamstring tendons allografts have been reported and well described in literature 3. Using Achilles tendon allograft has also been used in extensor mechanism reconstruction 4. However this report describes a unique configuration of the Achilles tendon- Calcaneal bone allograft for the reconstruction of neglected patellar tendon avulsion. With the allograft fashioned in a cobra tongue like bifid configuration, providing the chance to ascertain bone-to-bone fixation in tibial sockets on both sides of the tibial tuberosity. Using this technique as a form of augmentation could provide additional strength to the primary approximation of the tibial tendon and the quadriceps tendon (through patellar tunnels).

4. Conclusion

Spreading the allograft over a larger surface area may provide an advantage in extensor mechanism augmentation, that presents a wider surface area for load distribution during active function of the extensor mechanism. Furthermore bone-to-bone fixation can also be advantageous on the tibial side.

Large allograft should always be used with caution, as it may get infected, hence using it would ideally be preserved for healthy patients with no obvious local or systemic risk of infection.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained.

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