

RECONSTRUCTION OF CHRONIC QUADRICEPS TENDON RUPTURE USING AUTOLOGOUS SEMITENDINOSUS GRAFT: A CASE REPORT

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INTRODUCTION :

Chronic quadriceps tendon rupture is a relatively rare injury that can be challenging to treat. While autologous tendon grafting is a widely accepted method, it is acknowledged that the process of harvesting tendons results in extended rehabilitation and heightened surgical complications, especially in older patients or those with pre-existing co-morbidities. The reconstruction of chronic quadriceps tendon injuries presents significant challenges and yields unsatisfactory results.¹ In this case report, we reported a 17-year-old male with chronic quadriceps tendon rupture treated using ipsilateral semitendinosus graft and suture anchor to propose an option of surgical technique for quadriceps tendon reconstruction

CASE HISTORY :

A 17-year-old male came to our institution with left knee pain since 8 months ago after he fell into a ditch. After the incident, the patient complained of left knee pain, especially when he tried to straighten his knee. Physical examination demonstrated palpable gap on suprapatellar region.

METHODS :

The pre-operative radiographic examinations showed no abnormalities (Figure 1), while magnetic resonance imaging demonstrated quadriceps discontinuity and hyperintensity surrounding the insertion of the quadriceps tendon (Figure 2). On inspection, there was palpable gap on suprapatellar region (Figure 3A). On intraoperative finding we noticed huge defect of the quadriceps tendon that was surrounded by fibrotic tissues (Figure 3B-D).

CONCLUSION AND RESULTS :

We performed quadriceps tendon reconstruction using ipsilateral autologous semitendinosus graft. The proximal part of the graft was fixed to the remnant of quadriceps tendon using the 5-0 Ethibond with Krackow suture technique. The distal part of the graft was fixed to the patella using double 5.5 mm metal suture anchors at the superior pole of patella. The postoperative Xray is shown in Figure 4. Postoperatively, the patient was immobilized in backslab with his left knee in fully extended position. After 3 weeks the

patient was sent for physiotherapy to regain his left knee's range of motion. At final follow up at six months, patient was able to walk with bipedal unassisted normal gait. Active knee extension and straight leg raising was possible. Final knee range of motion was from 0° to 130°

DISCUSSION :

The injury known as "chronic extensor mechanism quadriceps tendon rupture" is a severe condition that typically occurs when the rupture is not diagnosed in a timely manner, either owing to misdiagnosis or the incomplete rupture progressing to a complete rupture and seeking medical assistance at a later stage. Chronic rupture of a muscle will cause the muscle to contract, resulting in an expansion gap. The muscle body in this area becomes scarred, and the gap cannot be reduced. In addition, the quadriceps muscle experiences atrophy, leading to weakened quadriceps even after undergoing repair. This weakness, along with arthrofibrosis and residual stiffness, hinders the ability to attain the whole range of motion. In this patient, we used semitendinosus muscle in the specific situation of Quadriceps Tendon Rupture (QTR). The patient was reported to be free of any significant complaints. Various surgical methods can be employed to treat acute quadriceps tendon ruptures, including transosseous patellar tunnels, end-to-end sutures, anchor fixation, and graft augmentation. For cases of chronic quadriceps tendon rupture with tissue loss, it is advisable to utilise an autologous graft for the purpose of repairing and restoring the structure and function of the quadriceps tendon. McCormick and al [2] performed a surgical intervention utilising autografts from the patient's semitendinosus and gracilis tendons to repair and substitute injured tendons in instances of chronic quadriceps tendon rupture. The hamstring tendon transplant was threaded through the quadriceps tendon (QT) and went through three patellar tunnels, which were created by piercing the bone. Afterwards, the graft was secured and attached to the distal end of the patella. The semitendinosus graft is an autograft commonly employed in surgical procedures for anterior cruciate ligament (ACL) replacement. The semitendinosus tendon, in conjunction with the gracilis tendon, is extracted from the patient's own hamstring muscles and employed as a transplant to substitute the damaged ACL [3]. The semitendinosus tendon is folded to form a 4-stranded graft, resulting in a rigid biomechanical structure that is stiffer than other grafts including the patellar tendon, quadriceps tendon, and Achilles tendon grafts. A study has shown the restoration of the mechanical characteristics of the hamstring tendons following ACL surgery using a semitendinosus tendon autograft. Quadriceps tendon rupture that is not treated promptly can result in unfavourable outcomes, such as decreased functional outcomes, worse satisfaction levels, and reduced isokinetic data in patients who have delayed repair [4]. Postponing the surgical procedure can result in tendon shortening, scar tissue formation, and reduced blood circulation, ultimately leading to an unfavourable outcome.

CONCLUSION :

The surgical management of chronic quadriceps tendon rupture poses significant challenges and is currently lacking evidence-based guidelines. In this research, we suggest utilizing an ipsilateral semitendinosus tendon autograft as the preferred treatment for chronic quadriceps tendon rupture, as it results in a positive outcome after surgery.

DECLARATIONS :

The authors confirm that they have no conflicts of interest associated with this publication.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Parental Consent for Minor :

Written informed consent was obtained from the patient's parents/legal guardian for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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