A complex knee injury in a rugby league player
Combined rupture of the patellar tendon,
anterior cruciate and medial collateral ligaments, with a medial meniscal tear

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Case report

A 23-year-old male sustained this injury whilst playing state level rugby league. The injury occurred while the player was carrying the ball forward for the “attacking” team and was tackled by three other players. Video footage of the incident is provided (See Appendix A). Analysis of the video suggests two points during the tackle when there was the potential for injury. The first occurred when the player was in single leg stance whilst running and received impact to his upper body from three defenders. The second occurred when the player landed on the knee and sustained a varus and hyperflexion force under the weight of two defenders.

Three days later the patient presented to a routine orthopaedic outpatient appointment where clinical examination was suggestive of this injury. An urgent MRI scan confirmed the findings, and the selected images are provided (See Figs. 1 and 2). After discussion, it was decided to repair the structures in a staged procedure involving two operations with a rehabilitation period in between.

The initial procedure was performed 10 days post injury. In this procedure we used an anterior longitudinal incision to repair both the PT and the MCL. Intra-operatively the PT was noted to have a subtotal rupture with medial and lateral retinacular structures intact. It was repaired using Ethibond suture in a Kessler pattern, and reinforced with a PDS mattress suture. Additional protection was provided by four loops of 1 PDS suture fixed in a box wire fashion through the patella and below the tibial tuberosity. The MCL was noted to be elongated and avulsed from its tibial insertion. It was tensioned and fixed to its tibial attachment using a staple. Post-operatively the patient underwent a standard rehabilitation programme following PT repair. At three months post-operation the patient was full-weight bearing with 110° flexion; at this point plans were made for the second procedure.

The second procedure was done 14 weeks after the initial procedure. Using a four-strand-hamstring graft harvested from the contralateral leg, we performed an arthroscopic ACL reconstruction. Interestingly a medial meniscus tear seen on the initial MRI was found to be healed and was stable to testing. Post-operative recovery was complicated by a superficial wound infection requiring antibiotics. A standard ACL rehabilitation programme with closed chain physiotherapy was used. At most recent follow-up, the patient was four months post-operation and back to straight line running without any problems.
Discussion

Combined rupture of the PT, ACL, and MCL with a medial meniscal tear is a rare injury. A careful clinical examination is important when the injuries are suspected to have occurred individually, as the combined injury was missed in several of the previous case reports.\textsuperscript{1–3,5}

In the eight cases reported previously\textsuperscript{1–3,5} the mechanism of injury was not well described. In our case, it is possible that all structures were damaged at one of two points in the tackle or that the PT was injured separately to the ACL and MCL. Rupture of the patellar tendon is known to commonly occur after both quadriceps contraction against a sudden load placing the knee into a flexed position, and, hyperflexion injuries,\textsuperscript{4} and thus could have occurred at either point. Similarly ACL rupture occurs after both cutting type movements and during impacts causing valgus stress to the knee, both of which also occurred during the tackle.

The goal of treatment in this condition is restoration of both the extensor mechanism and knee stability. In a combined injury such as this planning of treatment is complicated by the differing rehabilitation aims of the patellar tendon repair and the ligament repairs. Early primary repair of a patellar tendon is widely accepted to provide the best outcome.\textsuperscript{4} Conversely ACL reconstruction within the first three weeks post injury has been shown to have an increased incidence of arthrofibrosis.\textsuperscript{6} A staged treatment approach with early repair of the MCL and patellar tendon followed by an intensive rehabilitation programme and subsequent arthroscopic reconstruction of the ACL at a later date as done in our case allows integration of these elements. A similar technique\textsuperscript{2,3} was used successfully in other cases. All the treatment techniques for the remainder of the published cases appear to achieve less successful outcomes.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.injury.2008.05.004.

References