



High-volume image-guided injection for recalcitrant medial collateral ligament injuries of the knee



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AIM: To evaluate the effectiveness of a novel injection technique in the management of recalcitrant medial collateral ligament (MCL) injuries of the knee.

MATERIALS AND METHODS: The injection, comprising 10 ml local anaesthetic with 25–50 mg hydrocortisone, is directed beneath the periosteal attachment of the MCL. Twenty-eight patients who received the intervention were asked to complete a questionnaire, a visual analogue scale (VAS) and the International Knee Documentation Committee (IKDC) subjective knee form to quantify symptoms pre-injection and at follow-up. Data were assessed using descriptive statistics. Further analysis was conducted using the Wilcoxon signed-rank test and Fisher's exact test.

RESULTS: Sixty-eight percent ($n = 19$) of patients responded. Three patients were excluded according to the exclusion criteria. Of those studied, 37.5% ($n = 6$) were professional athletes. At follow-up, patients reported a mean improvement on the VAS of 75.5% (SD = 23.6). There was a significant improvement in IKDC scores (mean difference 42%, SD = 14.2) pre- and post-injection (Wilcoxon signed-rank test, $p < 0.001$). No residual symptoms were reported by 50% ($n = 8$) of patients, and a further 37.5% ($n = 6$) of patients had improved. Of those patients who played sport, two-thirds ($n = 10$) had returned to their previous level of sport at follow-up, including all of the professional athletes.

CONCLUSION: Periosteal high-volume image-guided injection is a useful treatment for recalcitrant MCL injury. Results are encouraging, particularly amongst the professional athletes studied.

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Introduction

The medial collateral ligament (MCL), the primary stabilizer of the knee to valgus stress, also protects it against

excessive external tibial rotation. The MCL is the most commonly injured ligament of the knee,¹ accounting for 15–20% of all injuries, and 60% of knee injuries in alpine skiing.² MCL injuries are common in rugby union where they are second only to anterior cruciate ligament injuries in the number of days missed per injury (average of 32 days), and account for almost one-third of knee injuries.³ MCL injuries occur in 24% of elite collegiate American football players,⁴ and are the second most common injury in collegiate ice-hockey players.⁵

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MCL tears are often treated conservatively,² and remodelling may continue for years.⁶ Thus, the injured MCL can be abnormal for a long period. Collagen fibrils are narrower in the healing MCL,⁷ although the ligament is usually thickened on imaging⁸ (Fig 1). Large proteoglycans accumulate in the healing tissue, and may stimulate ongoing inflammation. These inferior material properties lead to a weaker tissue, which has only half of the tensile strength of the normal MCL for up to 2 years post-injury.⁷ Patients with MCL injury may experience prolonged pain and instability, preventing return to sport.⁹ They are susceptible to further injury when even minor valgus stress is applied to the damaged MCL. However, most patients report chronic load-related pain rather than pain resulting from re-injury. These prolonged symptoms may be related to chronic thickening rather than acute-on-chronic re-injury.

There is a paucity of research concerning effective treatment of recalcitrant MCL injury. Jones et al.⁹ reported favourable results after treatment of chronic MCL injuries with a corticosteroid injection and repeated needling of the ligament.⁹ However, they addressed pathology of the deep portion of the MCL only. The aim of the present study was to assess the use of a novel injection therapy, periosteal high-volume image-guided injection (PHVIGI), in the management of recalcitrant MCL injury.

Materials and methods

Ethical approval was granted by the Ethics Committee at Queen Mary, University of London. All patients treated with PHVIGI during a 2-year period ($n = 28$) were identified from the computerized records of the clinic. Patients were included if they were between 18 and 65 years, and had a symptomatic MCL injury for >1 month. Twenty-eight patients were identified. Those who had a concomitant lower limb injury ($n = 2$) or had undergone further procedures prior to follow-up ($n = 1$) were excluded prior to data analysis.

Patients were sent a coded study-specific questionnaire, with minor adaptations from previously published work,¹⁰ and two copies of the International Knee Documentation Committee (IKDC) subjective knee form, to record their symptoms pre- and post-PHVIGI. The IKDC form was used given its high test-retest reliability¹¹ and responsiveness to change.¹² The study-specific aspect included questions on sporting details (primary sport, hours of activity/week, level of competition), duration of symptoms, recovery (back to normal/slightly better/improved but recurred/no improvement), and return to sport (previous level/lower level/unable to return/not yet attempted). Patients were asked to indicate on a 10 cm visual analogue scale (VAS) the extent of improvement, if any, post-PHVIGI. Consent was implied if patients returned the questionnaire. If it was not returned, the patient was contacted once via telephone as a reminder.

Injection procedure

The same radiologist injected all 28 patients. The MCL was imaged using ultrasound (Acuson Antares; Siemens,



Figure 1 This image of the right knee shows a thickened MCL (indicated by the arrows) on a coronal proton-density sequence. There is no increased signal (to indicate acute oedema) within the ligament; therefore, this thickening is likely to be consistent with chronic injury.

Munich, Germany) with a high-frequency probe longitudinally and transversely. It was assessed for mediolateral thickening (Fig 2) and degeneration (change in normal parallel fibrillar structure) and compared to the asymptomatic side. Those patients diagnosed with a recalcitrant MCL injury were informed of the risks and possible benefits of PHVIGI, and verbal consent for the injection was obtained.

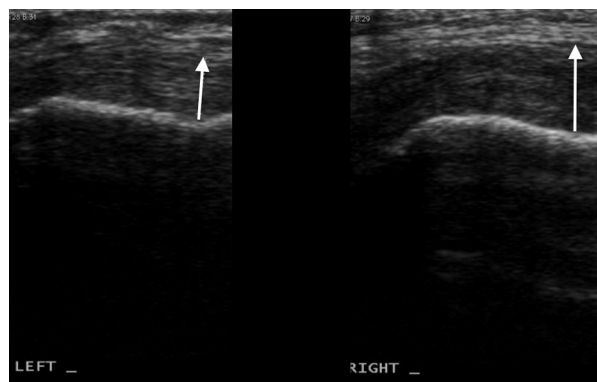


Figure 2 This image shows longitudinal views of the MCLs of the knee as seen at ultrasound. On the left side is the asymptomatic MCL of the left knee, and on the right, is the symptomatic MCL of the right knee. The arrows allow comparison of the width of the ligaments showing a thickened ligament on the right side.

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