

# Anterior Cruciate Ligament Ganglion Cyst Treated Under Computed Tomography–Guided Aspiration in a Professional Soccer Player

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The occurrence of intra-articular ganglions in patients referred for knee examination is rare (1.3%),<sup>3</sup> and previous studies have demonstrated that the most common cysts are located in the anterior cruciate ligament (ACL) (62.6% to 75.4%).<sup>7,8</sup> While its etiology is unclear, some authors affirm that cysts appear after a trauma and others advocate for an origin of cystic degeneration within the ligament.<sup>11,13</sup> The presence of these intra-articular cysts can occasionally become symptomatic, causing pain and limiting activities.<sup>8,12,15</sup>

The diagnosis of an intra-articular ganglion cyst can be clearly made by magnetic resonance imaging (MRI).<sup>4,6</sup> Currently, arthroscopic resection of the cyst is the most common method of treatment for symptomatic cysts.<sup>2</sup> Arthroscopic debridement for this condition could lead to complications, such as iatrogenic injury to the ACL.<sup>3,13</sup> To hasten the improvement of symptoms and return to play, we proposed an alternative treatment option with the use of computed tomography (CT)–guided aspiration of the ACL ganglion cyst, a previously described technique with clinical success.<sup>1</sup>

The purpose of this study was to report results in a professional athlete with both 2-year clinical and MRI follow-up. Institutional review board approval was obtained for this study.

## CASE PRESENTATION

A 25-year-old international professional soccer player was evaluated in our clinic for atraumatic, isolated knee pain and significant limitation of knee flexion at the conclusion of the 2012-2013 professional soccer season. The patient complained of a vague pain in the right knee, initially occurring for about 1 month, that did not result in any lost playing time or medical treatment. Thereafter, the patient experienced a sudden limitation of range of motion (ROM). Clinical examination revealed pain with terminal flexion and a flexion loss of 15°. Stability tests, including Lachman, anterior and posterior drawers, pivot shift, and valgus and varus stress, were all negative. A rolimeter demonstrated a side-to-side difference of 2 mm compared with the contralateral knee. An MRI was completed, which subsequently revealed an ACL ganglion cyst with an anterior-posterior dimension of 16.6 mm (Figure 1).

The patient was scheduled to participate in the upcoming World Cup in June 2014, and arthroscopic debridement might not have allowed for a full return to sport prior to the beginning of the games. The decision was subsequently made to perform a CT-guided aspiration instead to facilitate rapid recovery and return to sport.

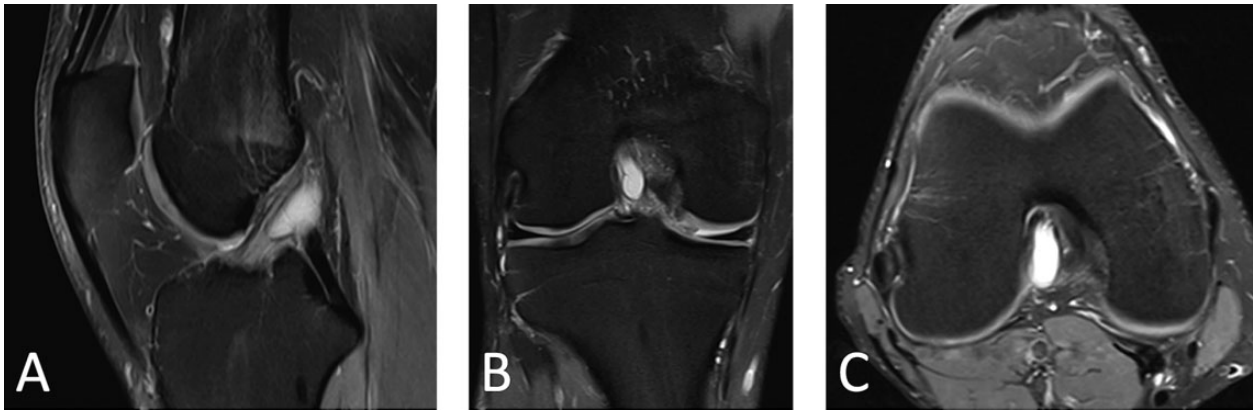
A radiologist performed the procedure under CT scan control using a posterior-lateral approach without anaesthesia. Aspiration of the cyst was performed using a 22-gauge

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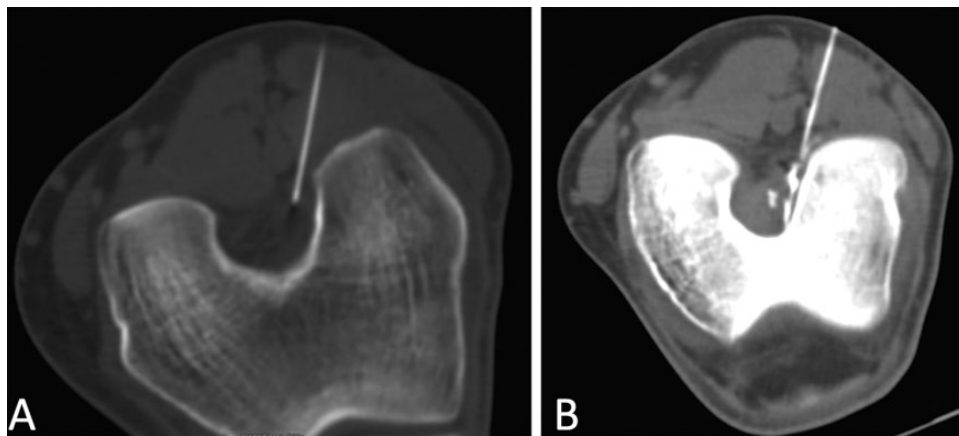
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**Figure 1.** MRI showing ACL ganglion cyst. (A) Sagittal, (B) coronal, and (C) axial views.



**Figure 2.** (A) Identification of the ACL ganglion cyst measuring 16.6 mm. (B) Aspiration of the cyst by a 22-gauge needle through posterolateral approach.

needle, followed by injection of corticosteroid (Cortivazol 3.75 mg, 1.5 mL) into the lesion (Figure 2).

The procedure resulted in instantaneous relief of the patient's pain and ROM limitation. The professional soccer player was able to return to training 1 week later and was able to play at the World Cup without pain or limitation.

Twenty-four months later, he is still asymptomatic during all sports and daily activities. An MRI of the same knee was obtained secondary to an unrelated medial collateral ligament (MCL) injury that occurred during a game. The MRI shows the continued presence of the ganglion cyst but with a significant reduction in its size (anterior-posterior dimension of 5.4 mm) (Figure 3). Physical examination at last follow-up demonstrated pain-free ROM of the knee, continued stability with ligamentous testing, and the same 2-mm side-to-side difference in rolimeter testing.

## DISCUSSION

Ganglion cysts associated with knee cruciate ligaments are uncommon and usually occur in the ACL, with a prevalence

of 1.3% in a group of 1767 consecutive patients referred for MRI examinations of the knee and 0.6% after arthroscopy.<sup>8,11,12</sup> The etiology of these ganglion cysts is unknown. Despite many reports of ganglia developing in the absence of trauma, it is believed that repetitive micro-trauma from joint and soft tissue motion causes expansion of both mucin and hyaluronic acid from ligament fibers, thus acting as a potential trigger.<sup>3</sup> Others advocate for an origin of cystic degeneration within the ligament itself, with subsequent mucoid degeneration and ganglion cyst formation, a similar pathogenesis as in intraosseous cyst formation.<sup>11,13</sup>

Most cysts are asymptomatic, but in some cases they can be a significant source of pain and discomfort.<sup>3,9</sup> Frequently, the symptoms are vague and include posterior knee pain, limitation of ROM, stiffness, and swelling.<sup>3,9</sup> On MRI, these lesions appear as cystic masses with fluid signal intensity within the synovial layer of the ligament.<sup>10</sup>

Not all diagnosed ganglion cysts need to undergo specific treatment, only those that are symptomatic. There are different options for the management of this intra-articular cyst type: functional treatment, arthroscopic excision or



**Figure 3.** Two-year follow-up MRI showing ACL ganglion cyst with a significant reduction in size (anteroposterior dimension, 5.4 mm). (A) Sagittal, (B) coronal, and (C) axial views.

puncture, CT scan or ultrasound-guided aspiration, puncture, or infiltration.<sup>1,5,9</sup>

Several criteria must be taken into consideration before choosing the right procedure among the presented options: level of activity, time for recovery, risk of intra-articular damage, risk of recurrence, and risk of ACL injury.

Arthroscopic treatment has demonstrated good outcomes, with 95% of patients reporting good to excellent results.<sup>2</sup> It is useful for complete excision of the cyst and treating other associated intra-articular pathologies. Additionally, arthroscopy has a very low rate of recurrence compared with other procedures.<sup>5,8,9</sup> Its main disadvantages are the need for hospitalization, need for anesthesia, an increase in time to recover, and most notably, a high risk of ACL rupture and instability reported in some cases.<sup>5,8</sup>

The use of CT-guided aspiration and injection has been described previously.<sup>1</sup> This treatment method has the advantage of a quick recovery, which was necessary for this professional athlete. In this case, the patient experienced immediate improvement in pain and knee ROM without complication or side effect. We believe this procedure has several advantages: it is quickly performed by an experienced radiologist with or without local anesthesia, with very few side effects or complications.<sup>5,14</sup> High-level athletes require quick return to play with minimal side effects, and this case demonstrates CT-guided aspiration and injection as a safe treatment option for this unique subset of patients. Our clinical and imaging follow-up demonstrated resolution of his symptoms and a significant decrease in the size of the lesion without any ill harm sustained to the ACL. Our study demonstrates CT-guided aspiration and injection as a potential treatment for these uncommon cysts that offers a rapid resolution of symptoms and return to activities. Further studies are needed to demonstrate the efficacy of CT-guided aspiration and injection compared with arthroscopic debridement as the treatment of choice in symptomatic, intra-articular ganglion cysts.

## CONCLUSION

CT scan-guided aspiration in this case was an effective and safe treatment for symptomatic ACL ganglion cyst in athletes.

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