Case Report

Concurrent Ligament and Meniscal Injuries in a 27-Year-Old Male, Management through Acupuncture and Cold Knee Pack: A Case Report

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ABSTRACT

Multiple ligament knee injuries are complex and challenging conditions that often result in long-term impairment and reduced quality of life for those affected. These injuries commonly involve damage to two or more of the knee's primary stabilizing structures, including the anterior cruciate ligament, posterior cruciate ligament, medial collateral ligament, and lateral collateral ligament. The management of such injuries remains a topic of debate in healthcare. Electro-acupuncture and cold packs, a non-pharmaceutical treatment modality, have shown promising results in the management of musculoskeletal conditions, including ligament injuries. A 27-year-old patient with concurrent ligament and meniscal injuries, mostly Grade 2 multiple ligament injuries, was given electroacupuncture and a cold knee pack 5 times a week for 2 months. The needles used were disposable, sterile, stainless steel 0.25mm x 25mm to a depth of 20-25mm and were inserted perpendicularly at Gall Bladder 34, Spleen 9, Spleen 10, Urinary Bladder 40, and Kidney 3 bilaterally. Gall Bladder 34 and Spleen 9 were connected to electroacupuncture for 20 minutes with continuous stimulation. Followed by a cold knee pack, a 5-feet-long, 5-inch-wide white cotton cloth dipped in cold water (55º to 65º F), wrapped around the knee, and then covered with a similarly sized woollen cloth for 20 minutes. Results show that after 2 months of treatment, the Visual Analogue Scale (VAS) reduced pain from 8 to 0. The lateral and medial stress tests are negative. Magnetic Resonance Imaging (MRI) shows that grade 2 medial collateral ligament injuries become completely normal. Electroacupuncture and cold knee packs show promising pain reduction and promote healing.

Key words: ACL injury, Cold knee pack, Electroacupuncture, Meniscus injury.

An injury to the knee that involves tears to two or more of the four main knee ligament structures is known as a multiple ligament knee injury (MLKI). Anterior cruciate ligament (ACL), Posterior cruciate ligament (PCL), Medial collateral ligament (MCL), Lateral collateral ligament (LCL) [1]. ligaments are the knee's static stabilizers, whereas Muscles are active structures that produce the forces required for the movement of the joint [2]. Multiple ligament Knee injuries are common sequelae of traumatic events (Sports and Accidents), often involving ligamentous and meniscal structures [3]. Among these ligaments, ACL is the most common ligament to be injured and the annual incidence in the general population is 0.03% (4). Multiple ligament injuries in the knee can be difficult to diagnose and treat, and they frequently leave afflicted people with long-term impairment and a reduced quality of life. The Management of ligament injuries is still debatable for primarily surgical (surgical reconstruction) or primarily rehabilitation (if instability and pain persist option for surgical reconstruction) [3,4].

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Electroacupuncture, a non-pharmaceutical treatment, effectively manages pain, particularly in musculoskeletal conditions. Its therapeutic benefits stem from both central and systemic mechanisms, influencing the brain, autonomic nervous system, and local acupuncture sites. Research indicates that acupuncture modulates neurotransmitter and hormone levels, including beta-endorphin, dopamine, serotonin, and cortisol [5]. Acupuncture facilitates the healing of ligament injuries via increasing cellular activities like increasing type III collagen, mRNA and Protein levels elevated in injuries site [6]. Acupuncture concerning Sports Injuries in terms of case studies has been published steadily. Cold knee pack is a method of Naturopathy treatment for joint disorders to alleviate pain and increase the healing process [7].

CASE PRESENTATION

A 27-year-old male visited the outpatient department of the

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International Institute of Yoga and Naturopathy Medical Science with complaints of knee pain and mild instability in both legs. On physical examination, the Lachman Test and Anterior drawer test are negative, the medial and lateral stress test is positive, and the numerical pain intensity scale indicates 8 out of 10. A detailed history revealed a twisting injury during recreational sports 1 ½ years ago. MRI during the past year showed a horizontal tear of the posterior horn of the medial meniscus extending to the tibial articular surface, a mild ACL sprain, and trace joint effusion in the left knee. The patient had been given immobilization with Paster of Paris and rest immediately following the injury. His pain had subsided after the above treatment, and he had continued his regular activities after 15 days. His pain gradually increased, associated with mild swelling in both legs, when regular activities were continued.

Due to intolerable pain, swelling, and mild instability in both legs, he was advised to retake an MRI on both knees. The MRI was taken 1 year after the twisting injury from recreational sports. The MRI revealed the following: Grade II Anterior Cruciate ligament injury, Posterior horn of medial meniscal Grade II injury, Grade II medial and lateral collateral ligament injury, medial and lateral patellar retinaculum Grade I injury, and minimal joint effusion in left knee. Right knee evaluation revealed Grade II anterior and posterior cruciate ligament injury, lateral patellar retinaculum Grade I injury, minimal joint effusion, and right tibial giant enostosis. Considering other orthopaedist suggestions for surgery, the patient opted for acupuncture and naturopathic treatment.

TREATMENT

The patient was given electroacupuncture 5 times a week for 2 months. The needles used were disposable, sterile, stainless steel 0.25mm X 25mm to a depth of 20-25mm and were inserted perpendicularly at Gall Bladder (GB) 34, Spleen (Sp) 9, Spleen 10, Urinary Bladder (UB) 40, and Kidney (K) 3 bilaterally. These acupuncture points were chosen because they are local points around the knee, with K3 located distally to help reduce the pain. After all, it has rich nociceptors that act as counter-pain irritation [8,9].

Locations of each acupoint:

- GB 34 -In the depression anterior and inferior to the head of the fibula.
- SP 9 - Located in a depression distal to the medial condyle of the tibia.
- SP 10 - Located 2cun proximal and slightly medial to the medial superior border of the patella.
- BL 40 – In the centre of the popliteal crease.
- K 3 – In the depression between the highest prominence of the medial malleolus and the Achilles tendon.

Two points on both legs Gall Bladder 34 and Spleen 9 were connected to an electroacupuncture instrument [Figure 1]. A continuous mode of electrical stimulation was given for 20 minutes with an acceptable level of electrical stimulation (intensity) to the patient. The following cold knee pack comprises a 5-feet-long, 5-inch-wide white cotton cloth dipped in cold water (55º to 65º F), wrapped around the knee, and then covered with a similarly sized woollen cloth for 20 minutes, 5 times a week for 2 months.



Figure 1: Intervention acupoints.

RESULT

Following this combined treatment regimen for 2 months, the patient reported a reduction in pain from 8 (on a scale of 0 to 10) to 0. Medial and Lateral Stress tests are negative. MRI findings indicated a left knee with grade II medial collateral ligament healed completely and remaining injuries stated Grade II ACL injury, grade II posterior horn of medial meniscus injury, grade II lateral collateral ligament injury, and grade I medial and lateral patellar retinaculum injury, with minimal joint effusion. The right knee showed grade II ACL and PCL injury, grade 1 lateral patellar retinaculum injury, minimal joint effusion, and a tibial giant enostosis.

DISCUSSION

This case underscores the complex nature of knee injuries following a traumatic event. Early recognition and comprehensive evaluation are crucial for the appropriate management of the knee ligament injury. In this case, the subsequent progression and compensatory injuries highlight the importance of considering the entire kinetic chain when assessing knee pathology. Electro-acupuncture and Cold Knee packs alleviate the pain reduce the progression of injury and improves the healing process. Electro-acupuncture given around the knee along the local points in the meridian has been known to improve the effect of the treatment, thereby stimulating the peripheral nerves and stabilizing the tendons around the knee, further strengthening the knee joint [10]. Additionally, electro-acupuncture of the knee can activate the hamstring muscle, resulting in pain reduction and improved joint mobility [9].

Cold therapy has numerous physiological systems involved in cold therapy that produce a local anaesthetic effect known as cold-induced neuropraxia. It produces an analgesic effect by lowering the nociceptor's activation threshold and reducing the pain-transmitting nerve's conduction velocity [11]. Cold packs provide an analgesic effect by reducing the number of inflammatory markers thereby reducing the scores of VAS [12]. The action of cold is vasoconstriction followed by vasodilation, which improves blood flow to the knee thereby removing necrotic tissue and promoting healing. In vitro studies have shown that cold therapy improves ligament repair [13]. The cold-sensitive peripheral nervous system's transient receptor potential ion channels are activated to do this. Chronic inflammation and oedema can be reduced by reducing the expression of inflammatory mediators [14].

Combining acupuncture with cold knee packs not only reduces pain but also physiologically supports the healing process, ensuring comprehensive recovery and improved long-term outcomes for knee injuries.

CONCLUSION

Concurrent ligament and meniscal injuries can present following traumatic events, necessitating thorough evaluation and management. Electro Acupuncture and Cold knee packs alleviate the pain and promote healing. Further researches on electroacupuncture and cold knee pack can be more satisfactory for the management of multiple ligament injuries in non-surgical management.

REFERENCES

1. Pardiwala DN, Subbiah K, Thete R, *et al*. Multiple ligament knee injuries: Clinical practice guidelines. Journal of Arthroscopic Surgery and Sports Medicine. 2021; 3:40–9.
2. Woo SLY, Wong EK, Lee JM, *et al*. Ligaments of the Knee in Sports Injuries and Rehabilitation.
3. Fortier LM, Stylli JA, Civilette M, *et al*. An Evidence-Based Approach to Multi-Ligamentous Knee Injuries. Orthop Rev (Pavia). 2022; 14(4).
4. Saueressig T, Braun T, Steglich N, *et al*. Primary surgery versus primary rehabilitation for treating anterior cruciate ligament injuries: a living systematic review and meta-analysis. Vol. 56, British Journal of Sports Medicine. BMJ Publishing Group; 2022. p. 1241–51.
5. Lee JW, Lee JH, Kim SY. Use of acupuncture for the treatment of sportsrelated injuries in athletes: A systematic review of case reports. Vol. 17, International Journal of Environmental Research and Public Health. MDPI; 2020. p. 1–24.
6. Dong-Seok Heo DHG. Effects of Warming Acupuncture on Ligament Recovery in Injury-induced. 2006.
7. Singh P. Integrated Management of Knee Osteoarthritis Associated Hypertension with Naturopathy and Yoga: A Case Report. International Research Journal of Ayurveda & Yoga. 2022; 05(10):62–9.
8. Abbasoɨlu A, Cabioɨlu MT, Tuɨcu AU, *et al*. Acupressure at BL60 and K3 points before heel lancing in preterm infants. Explore: The Journal of Science and Healing. 2015; 11(5):363–6.
9. Deng C, Zheng H, Zhuo X, *et al*. Electroacupuncture following deep needle insertion at BL39 and BL40 improves acute anterior cruciate ligament injury: a case report. Vol. 41, Acupuncture in Medicine. SAGE Publications Ltd; 2023. p. 58–60.
10. Xu J, Zhou X, Guo X, *et al*. Effects of unilateral electroacupuncture on bilateral proprioception in a unilateral anterior cruciate ligament injury model. Medical Science Monitor. 2018; 24:5473–9.
11. Breslin M, Lam P, Murrell GAC. Acute effects of cold therapy on knee skin surface temperature: Gel pack versus ice bag. BMJ Open Sport Exerc Med. 2015; 1(1).
12. Kunkle BF, Kothandaraman V, Goodloe JB, *et al*. Orthopaedic Application of Cryotherapy. JBJS Rev. 2021; 9(1):e20.00016.
13. Cárdenas Sandoval RP, Garzón-Alvarado DA, Ramírez Martínez AM. A mathematical model of the process of ligament repair: Effect of cold therapy and mechanical stress. J Theor Biol. 2012; 302:53–61.
14. Malanga GA, Yan N, Stark J. Mechanisms and efficacy of heat and cold therapies for musculoskeletal injury. Vol. 127, Postgraduate Medicine. Taylor and Francis Inc.; 2015. p. 57–65.

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