

Acupuncture Improves Knee Meniscus Repair

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Researchers conclude that acupuncture increases the effectiveness of rehabilitation exercises after knee meniscus repair surgery. [1] Patients receiving acupuncture in a controlled clinical trial had less quadriceps atrophy, limping, locking, pain, and swelling than patients receiving only rehabilitation exercises. Patients receiving acupuncture also had significantly better range of motion, stability, and the ability to walk, jump, and climb stairs.

Researchers from the Third Affiliated Hospital of Nantong University

combined acupuncture with functional training exercises. Patients receiving both functional training exercises and acupuncture in a combined treatment protocol had superior patient outcomes compared with patients receiving only functional training exercises. The researchers conclude that the addition of acupuncture to a functional training regimen improves VAS scores, reduces the degree of quadriceps atrophy, increases range of motion (ROM) scores, and improves the Lysholm Knee Scoring Scale scores for patients after arthroscopic meniscus repair surgery.

Each knee has a pair of menisci, which are fibrocartilaginous pads located between the femur and tibia. Each meniscus plays a vital role in absorbing shock, relieving stress, and lubricating and stabilizing the knees. Meniscus tears are often caused either by an acute injury—such as a sudden twist or quick turn during sporting activities, or by chronic strains—such as cartilage degeneration in primary knee osteoarthritis. An individual with a torn meniscus may take a long time to recover, because the blood supply to the region is generally poor. In addition, a lack of proper management of meniscus tears leads to joint pain and instability, quadriceps atrophy, and secondary knee osteoarthritis, causing a negative impact on health and quality of life.

Arthroscopic meniscus surgery requires postoperative protection to allow healing. [2] While often effective, complications caused by this surgery include injuries to skin and nerves, blood clot formation, knee stiffness, and infections. [3] In Traditional Chinese Medicine, meniscus tears are often precipitated by deficiency of qi and blood, as well as poor qi and blood circulation. Acupuncture and moxibustion activate local blood circulation, transform stasis, drain dirty water buildup, and eliminate swelling. Importantly, postoperative application of acupuncture allows for faster recovery times with fewer complications.

Design

Researchers (Sun et al.) used the following study design. A total of 70 patients that received an arthroscopic meniscus repair surgery were treated and evaluated in this study. They were randomly divided into an acupuncture treatment group and a control group, with 37 and 33 patients in each group

respectively. Both groups received arthroscopic meniscus repair surgery, followed by identical functional training exercises for the knee. The treatment group also received acupuncture and moxibustion.

The statistical breakdown for each randomized group was as follows. The control group was comprised of 17 males and 16 females. The average age in the control group was 52.17 (± 9.84) years. The average weight in the treatment group was 72.72 (± 12.05) kilograms. The treatment group was comprised of 17 males and 20 females. The average age in the treatment group was 54.67 (± 10.94) years. The average weight in the treatment group was 73.56 (± 11.95) kilograms. There were no significant statistical differences in gender, age, and weight relevant to patient outcome measures for patients initially admitted to the study. The patients fulfilling the criteria as stated below were selected for the study:

- *Age >18*
- *A history of knee injuries*
- *Swelling, pain, clicking, locking, and tenderness of knee joints, with positive findings on McMurray, Apley, and Gravity tests*
- *Diagnosed with meniscus tears under MRI and arthroscopic findings*

Surgical Procedure

Under anesthesia, patients underwent an arthroscopic procedure to remove inflamed synovial tissue, repair the torn portion of the meniscus, and remove the damaged meniscal tissue. Within 24 hours after surgery, the surgical area was compressed with an elastic wrap. Within 48 hours after surgery, ice packs were used to relieve pain and inflammation.

Functional Training Exercises

Patients from both groups received functional training exercises. They involved the following sets of exercises:

- *The first set was conducted for 6 hours, 1 day after surgery. Patients performed isometric quadriceps, ankle flexion/extension, and toe flexion/extension exercises. The exercises were performed in sets of 10 repetitions, 20 – 30 sets per day.*
- *The second set was conducted 1 – 2 days after surgery. First, patients performed straight leg raising (SLR). They were instructed to lift the leg up to the desired angle (30 degrees) above the plinth and hold the contraction during the lifting phase for 10 seconds. This exercise was performed in sets of 10 repetitions, 20 – 30 sets per day. Next, patients received passive knee flexion/extension exercises for 30 minutes on a continuous passive motion (CPM) machine. The exercises were performed twice per day.*
- *The third set was conducted for 2 days, 1 month after surgery. Patients performed muscle strength training with a rolling walker.*
- *The fourth set was conducted 1 – 2 months after surgery. Patients were trained with full weight bearing walking.*

Acupuncture Procedure

Patients from the treatment group received acupuncture and moxibustion for 7 days, approximately 2 weeks after the surgery. A total of 4 – 8 acupuncture points were selected from a pre-selected set of acupuncture points:

- **SP9 (Yinlingquan)**
- **SP10 (Xuehai)**
- **ST34 (Liangqiu)**
- **ST35 (Dubi)**
- **EX-LE4 (Neixiyan)**
- **EX-LE5 (Xiyan)**
- **ST36 (Zusanli)**
- **ST40 (Fenglong)**

Upon disinfection, 0.35 mm × 40 mm or 0.35 mm × 50 mm acupuncture needles were inserted into the acupuncture points to a standard depth. After obtaining a deqi sensation, the needles were retained and moxibustion was applied to the same acupoints. Moxa cigar cuttings, each 2 cm long, were attached to each needle handle and ignited. Moxa was left in place to self-extinguish. A total of 3 moxa cigar cuttings were applied on each acupuncture point. One treatment session was administered daily.

Evaluations

Multiple subjective and objective instruments were used to measure patient outcomes at several data points: prior to the surgery (T1), and then 1 day (T2), 1 week (T3), 2 weeks (T4), and 4 weeks (T5) after completion of the surgery. First, the improvement of pain intensity was scored using the visual analog scale (VAS). Second, the muscle size was measured via MRI scans to assess the degree of quadriceps muscle atrophy. Third, knee joint range of motion (ROM) was recorded using a goniometer. Fourth, the general outcome of knee surgery was evaluated using the Lysholm Knee Scoring Scale, which measures the following:

- limp
- support, instability, locking
- stair climbing, squatting
- walking, running, jumping
- pain and swelling

At T1, T2, and T3, there was no significant difference between the two groups in improving healing parameters. At T4 and T5, the acupuncture treatment group showed significantly greater improvement than the control group. VAS scores at T4 and T5 in the patients of the acupuncture treatment group were all lower than those in the control group ($P < 0.05$). The degree of quadriceps atrophy at T4 and T5 in the treatment group were decreased significantly as compared with those in the control group ($P < 0.05$). ROM scores were increased significantly compared with those in the control group ($P < 0.05$) and the Lysholm Knee Scoring Scale scores at T4 and T5 in the treatment group increased significantly as compared with those in the control group ($P < 0.05$).

Results

The results indicate that acupuncture combined with functional training into an integrated treatment protocol is more effective than functional training as a standalone therapy. Sun et al. conclude that acupuncture is safe and effective for speeding up knee joint recovery after arthroscopic meniscus repair surgery.

References

[1] Sun XX, Gao SN, Chen WY, Wang H, Gu YL. Effect of the Function Training Combined with Acupuncture Moxibustion in Rehabilitation Treatment of Meniscus Injury of Knee Joint [J]. Journal of Liaoning University of TCM, 2015(12):165-168.

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