

Treatment of 256 cases of Osteoarthritis of Knee Joint with Guo Jianhua's Four-step Therapy

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256 cases of osteoarthritis of knee joint were treated with Professor Guo Jianhua's four-step therapy, i.e. acupuncture at five points in the knee to remove obstruction of collaterals and stop pain, massotherapy to separate adhesion and relieve spasm, fumigation and steaming with hot decoction to promote blood circulation and expel swelling, and functional exercises to consolidate the therapeutic effects. 121 cases were cured, 117 cases markedly effective, and 18 cases ineffective, with a total effective rate of 92.97%.

Osteoarthritis of knee joint is a common degenerative joint disease in clinic. From 2000 to 2003, the authors treated 256 cases of osteoarthritis with four-step therapy created by Professor Guo Jianhua of the authors' hospital with a satisfactory therapeutic result. The report is as follows.

CLINICAL DATA

There were 256 cases in this series, including 95 males and 161 females, ranging in age from 45 to 71 years, with an average of 58 years. The shortest duration was 2 months and longest 10 years. Involvement in unilateral knee was found in 147 cases and involvement in bilateral knees in 119 cases. All the cases were in accordance with *The Diagnostic Criteria of Osteoarthritis* drawn up by American Society of Arthritis.

METHODS

Acupuncture at five points in the knee to remove obstruction of collaterals and stop pain

The patient was in supine position with both legs laid

flatly. The aseptic 1.5-2 *cun* filiform needles were inserted into Neixiyan (EX-LE 4), Dubi (ST 35), Heding (EX-LE 2), Xuehai (SP 10), and Yanglingquan (GB 34) after routine disinfection. After the needling sensation was evoked, electric acupuncture stimulator was connected with the inserted needles and a disperse-dense current of intensity tolerable to the patients was applied. At the same time TDP radiation was applied to the affected knee. The treatment was given once daily, 20 min each time, 10 sessions as one course.

Massotherapy to separate adhesion and relieve spasm

The patient was in supine position with the whole body relaxed. The manipulations should be mild, quick, soft and penetrative with the strength from mildness to forcefulness. The treatment was given once daily, 10 sessions as one course. The manipulations were described in the following details:

1. Kneading the acu-points with thumb: The patient was in horizontal position. The doctor, standing on the affected side of the patient, kneaded Neixiyan (EX-LE 4), Dubi (ST 35), Xuehai (SP 10), Heding (EX-LE 2), Liangqiu (ST 34), Yanglingquan (GB 34), Yinlingquan (SP 9), Zusanli (ST 36) and Weizhong (BL 40) with the abdomen of thumb. The cord-like lumps and positive reaction sites were kneaded especially and plucked transversely with the radial side of abdomen of thumb. Each treatment was about 5 min.

2. Rolling, kneading and pinching the soft tissues of knee: The doctor used the manipulations of rolling,

kneading and pinching to relax the soft tissues around the knee including quadriceps muscles of thigh, adductor muscles, iliotibial tract, medial and lateral accessory ligaments. Each treatment was about 5 min.

3. Pushing, kneading and lifting the kneecap: The patient laid his both legs flatly. The doctor put his one hand on the affected knee-cap of patient and pushed upward, downward, internally and externally as well as interior-upward, interior-downward, exterior-upward and exterior-downward for 10-15 times. Forceful pushing was done towards the direction from which the resistant was felt. Then the doctor pressed the knee-cap with palm mildly and knead it towards the right, left and in circle for 10-15 times to make it rub on the cartilage surface of condyle of femur, lifted it with five fingers for 5-10 times, and forced it leave the cartilage surface each time.

4. Pulling the leg and extending and flexing the knee joint: The doctor stood at far-end of affected leg, fixed the ankle with both hands and vertically pulled the affected leg forcefully and continuously for 1-2 min to extend the knee joint to the maximum and moved the knee joint internally and externally for 5-10 times to have the space of the joint wider for separating the adhesion around.

Fumigation and steaming with hot decoction to promote blood circulation and expel swelling: Prof. Guo's experienced formula

Chuan Niu Xi (川牛膝 Radix Cyathulae) 15g,
 Ru Xiang (乳香 Olibanum) 6g,
 Mo Yao (没药 Myrrha) 6g,
 Hai Tong Pi (海桐皮 Cortex Erythrinae) 15g,
 Hong Hua (红花 Flos Carthami) 10g,
 Shen Jin Cao (伸筋草 Herba Lycopodii) 15g,
 Tou Gu Cao (透骨草 Herba Speranskiae Tuberculatae) 15g,
 Tu Fu Ling (土茯苓 Rhizoma Smilacis Glabrae) 15g,
 Gui Zhi (桂枝 Ramulus Cinnamomi) 10g,
 Ji Xue Teng (鸡血藤 Caulis Spatholobi) 15g,
 Fang Feng (防风 Radix Saposhnikoviae) 10g,
 Wei Ling Xian (威灵仙 Radix Clematidis) 10g.

All the herbs were soaked in 1500-2000 ml water in basin and decocted for 20-30 min. The affected knee covered by a towel was laid over the basin with about 30 cm distance from the decoction and fumigated for 10-15 min. When the herbal decoction was about 60°C, the affected knee could be soaked into it and washed while kneaded. Extending and flexing the joint was done till the decoction getting cool. The treatment was given twice daily, in the morning and evening, one dose a day, 10 doses as one course.

Functional exercises to consolidate the therapeutic effects

The principle of functional exercises was initiative motion without load for practicing the joint movement and building up the muscular strength to keep and improve the scope of joint movement, steady the balance of joint and consolidate the therapeutic effects. The exercises were described in the following:

1. Extending the knee in sitting: The patient was sitting on bed or chair with the feet putting on the floor. One knee joint was extended extremely and kept in the extending position till the sourness and distention were felt, and then slowly flexed. The other knee joint did in the same way. The extending and flexing movement should be carried out for 5-10 times.

2. Flexing the knee in prone position: The patient was in a prone position with both legs laid on the bed flatly. The knee joint of one side was flexed as closely as possible to the buttock and kept in the flexed position till the sourness and distention were felt, and then the slowly extended. Both legs practiced alternatively for 5-10 times.

3. Exercises of hamstring muscle: The patient was in supine position with both legs laid flatly. The unilateral knee joint was flexed and made as closely as possible to the chest. The upper leg was fixed with hands. Then the knee joint was gradually extended. It was flexed again when the sourness and distention were felt and then slowly laid flat. Both legs practiced by turns for 5-10 times.

4. Exercises of quadriceps muscles of thigh: The patient was in a prone position with both legs laid flatly. The one side knee joint was flexed and the ankle was encircled with a towel to pull the lower leg gradually toward the buttock. The pulling was kept for 1-2 min. Both legs practiced by turns for 5-10 times.

RESULTS

Evaluation Criteria for Therapeutic Effects

Cure: the clinical symptoms disappeared with no tenderness on the local joint and no limits to walking and going upstairs and downstairs. X-ray film showed the mild narrowing of joint space, mild sclerosis of the surface of kneecap and mild hyperplasia in the articular margin. Markedly effective: The clinical symptoms and signs were markedly improved, the pain significantly relieved, the pain appeared due to heavy load but relieved after rest, and there was little limit to going upstairs and downstairs. Ineffective: No significant improvement in symptoms and signs, and X-ray findings.

Therapeutic Result

There were 256 cases in this group. According to the above criteria, 121 cases were cured, 117 cases markedly effective, and 18 cases ineffective, with a total effective rate of 92.97% after 1-6 treatment courses and 6 months' follow-up.

DISCUSSION

Bony arthritis of knee joint is often seen in middle aged and old people. It is manifested by pain, rigidity and functional disturbance of the knee joints, regarded as "Bi syndrome" in traditional Chinese medicine. It usually occurs in the people of long-term and excessive work and with incorrect posture, and is induced easily by weather changes and irregular daily life. Its mechanism is: 1) Old and deficient essence and deficiency of *qi* and blood resulting in failure of bone to be nourished; 2) Invasion of wind, cold, dampness and heat blocking the *qi* and blood of channels and collaterals and accumulating in joints; 3) Long period of incorrect posture causing the injury of

joints, resulting in stagnancy of *qi* and blood in bones.¹ Generally speaking, deficiency of liver and kidney is the internal cause while invasion of pathogenic factors the external cause, with the soft tissues' adhesion and bones' malnutrition of joints as the result.

The modern studies have proved that the pathogenic change of osteoarthritis of knee joint is cartilage degeneration of the knee joint accompanied with subcartilaginous osteosclerosis and hyperplasia which eventually causes the injury and inflammation of synovium, joint capsule and soft tissues and leads to denaturation and obscission of articular cartilage with the pain and functional disturbance as clinical manifestations. The disturbance of intraosseous blood circulation and hindering of intraosseous venous return causes intraosseous hypertension. In addition, intra-articular hypertension resulting from inflammatory reaction may also cause obstruction of intraosseous venous return, which can produce an increase in intraosseous pressure and cause a slow degeneration of articular cartilage.^{2,3} Therefore, accelerating intra-articular and intraosseous blood circulation, lowering the intra-articular and intraosseous pressures and decreasing the stimulation of inflammatory factors are the key points to treat this disease.

Puncturing the points around knee may open the large quantity of capillaries in muscles to improve micro-circulation, at the same time to heighten the pain threshold of the local tissues to relieve pain. The stimulation given by an electric acupuncture apparatus with sparse-intense wave may produce rhythmical contraction of the local muscles, improve return of venous blood and lymph of the lower limbs, improve local blood circulation and tissue nutrition and prevent functional disturbance of joint from the muscular atrophy. TDP radiation may accelerate the blood circulation, improve nutrition of the tissues, and expel swelling for removing obstruction of channels and collaterals, relaxing tendons and stopping pain.

The massotherapy manipulation should be gentle and forceful. For the patient with severe redness and swelling in the knee joint, soothing the soft tissues around with mild strength is important, and then with the decreasing of swelling and pain, the manipulation can be getting gradually forceful with control in order to avoid injuring the soft tissues. The manipulations with yare, gentle and penetrative strength may quicken the blood circulation, decrease the intra-articular and intraosseous pressures, accelerate the absorption of inflammatory materials and benefit the synthesis of cartilage matrix of joints. The manipulations of kneading, pushing, lifting, plucking and pulling and the passive movement may relax the soft tissues around the knee joints, soothe the adhesion, and fully open the narrowing joint space, thus it is good for expelling adhesion and incarceration of synovium and restore normal secretion to improve the function of joints.

Fumigation and steaming with hot decoction may improve nutritional condition of the tissues around

knee joint, accelerate the blood circulation, improve the microcirculation, decrease intra-articular and intraosseous pressures, and improve or expel the aseptic inflammatory reaction to relieve pain with the herbal compositions penetrated into the affected area.

Functional exercises play a very important role in treating the bony arthritis of knee joints. The active exercises of low intensity without load may build up the strength of soft tissues, improve the movement, and strengthen the joint stability so as to relieve the symptoms and consolidate the therapeutic effects.

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