

## THEORETICAL STUDY

## Fracture healing with osteopathy in traditional Mongolian medicine

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## Abstract

**OBJECTIVE:** To explore the concept and norm of fracture healing with osteopathy in traditional Mongolian medicine (TMM).

**METHODS:** Based on the correspondence between man and the universe (including psychosomatic integration) in fracture healing with osteopathy in TMM, we used modern physio-psychological and biomechanical principles and methods to probe the integrated, dynamic and functional characteristics of fracture healing.

**RESULTS:** Based on the integration of limbs and the body, unification of the body and function and harmony of man and nature (including psychoso-

matic integration), fracture healing with osteopathy in TMM comprises the concept of natural functional healing of fractures, and follows the norm of considering physiological healing and psychological function as well as limb healing and motor function.

**CONCLUSION:** Fracture healing with osteopathy in TMM is characterized by a lack of trauma without future complications. This therapy makes the concept of fracture healing develop in the direction of humanity, behaviorism and integration.

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**Key words:** Osteopathic medicine; Fracture healing; Recovery of function; Mental healing

## INTRODUCTION

Healing is the aim of the repositioning and fixation of fractures. Good healing manifests not only by perfect healing of bony structures but also by complete restoration of motor (and psychological) function.

The technology underpinning fracture treatment has undoubtedly improved in recent times. However, various functional defects exist in surgical repositioning, internal/external fixation, and static healing. For example, the famous Chinese athletes Ming Yao and Ruirui Zhao received extremely high-quality therapies for their injuries, but a lack of functional recovery ended their sporting careers. Because of the "westernization" of medicine, fame and money induce many individuals with fractures to be treated by surgical methods (usually employing internal/external fixation and static healing), thereby incurring economic losses and psychosomatic trauma to patients.

Osteopathy in traditional Mongolian medicine (TMM) does not: exacerbate trauma; harm the perios-

teum; damage the blood circulation. It therefore has the advantage of natural healing without scarring.<sup>1,2</sup> Therefore, against a background of suboptimal therapies for fractures, osteopathy in TMM provides a new exploration for the treatment of fractures.<sup>3</sup>

## **METHOD OF FRACTURE HEALING WITH OSTEOPATHY IN TMM**

Fracture healing with osteopathy in TMM integrates external (and spontaneous) fixation and early exercise to restore function.<sup>4,5</sup>

### *External and spontaneous fixation*

Osteopathy in TMM integrates spontaneous fixation (with the binding force of surrounding muscles, tendons, skin and other soft tissues<sup>6,7</sup> and external fixation with small splints and sandbags.<sup>6,7</sup> Studies have shown that such fracture fixation conforms to the geometric, mechanical, motional, functional and psychological stability of bone – muscle systems in humans, thereby creating fixation without trauma as well as an opportunity for fracture healing and early exercise.<sup>8,9</sup> Osteopathy in TMM does not involve external fixation for general fractures. Starting from the idea of spontaneous fixation, external fixation is regarded only as auxiliary fixation.

### *Early exercise*

Osteopathy in TMM integrates external (and spontaneous) fixation and early exercise. Research shows that early exercise is characterized by considering physiological healing and psychological restoration as well as limb healing and motion restoration.<sup>10</sup> Fracture healing with osteopathy in TMM takes external (and spontaneous) fixation as a condition and functional healing as a goal to carry out early and progressive exercise for achieving the curative effect of fracture healing.

## **OVERALL PHILOSOPHY AND MANIPULATION OF FRACTURE HEALING WITH OSTEOPATHY IN TMM**

Osteopathy in TMM is based on the premise that fractures damage the balance of the human body.<sup>10,11</sup> That is, the balance between body and mind, and the balance between man and nature. Based on the integration of limbs and body, unification of body and function as well as harmony of man and nature (including psychosomatic integration), osteopathy in TMM has formed a unique concept and manipulation of fracture healing in long-term osteopathic practice.

By attaching importance to psychosomatic integration, osteopathy in TMM relies on the features of surrounding muscles, tendons, skin and other soft tissues to heal

fractures via physio-psychological means.<sup>10,12</sup> Stress is put on the coordination between the physician and patient to achieve physio-psychological harmony. While spouting wine massage is carried out at the fracture site in stages, the patient raises his/her affected limb and conducts some muscle-contracting activities to: improve blood circulation; prevent muscular atrophy, soft-tissue contracture and joint rigidity; stimulate potential healing instincts of the human body; gradually restore function.

Importance is also attached to correspondence between man and universe, and encouragement given to naturally healing functions elicited by early exercise.<sup>10,12</sup> According to the improvement in stability of fracture fixation as well as the flexibility of joint activity, more stress is put on the coordination between the physician and patient to achieve harmony of near-end and far-end activities and to conduct early functional exercise progressively, thus meeting not only the stress demand for fracture healing but also guaranteeing functional restoration.

Such therapy can harmonize and unify the closed system of "psychosomatic integration" (which cannot involve intervention) and the open system of correspondence between man and universe (which can involve intervention) to heal fractures and restore function naturally.<sup>10,12</sup> Based on the naturalism of harmony between limbs and the body, between the body and function, and between man and the universe, this therapy contains a macro-concept and manipulation on the functional healing of fractures.<sup>12</sup>

## **NATURAL NORM OF LIFE OF FRACTURE HEALING WITH OSTEOPATHY IN TMM**

Osteopathy in TMM is based on the concept that fractures damage the continuity of bony structures and the wholeness of bony function. Based on the idea of natural and functional healing of fractures, osteopathy in TMM has formed its natural norm of life on fracture healing in osteopathic criterion.

### *Norm with regard to considering physiological healing and psychological function*

A fracture breaks bony tissue, hurts surrounding muscles, tendons, skin and other soft tissues, and damages the continuity of bony structure and the wholeness of bony functions (including psychological function). Several studies have shown that early exercise is important for physiological healing and psychological restoration for fracture healing and functional restoration.<sup>1,3</sup> In view of swelling, pain and possible movement of fracture ends and soft tissues, osteopathy in TMM encourages patients to actively carry out exercise early for restoration of psychological function. Raising the affected limb can promote the return of flow of blood and

lymph as well as activity in the unfixed joint at the distal end. For example, in a fracture of an upper limb, finger activity is associated with a psychological effect. In a fracture of a lower limb, toe activity is associated with a psychological effect. Relaxing and contracting muscles can promote the return of flow of blood and lymph as well as prevent muscular atrophy and joint adhesion to create a suitable physiological environment for restoration of psychological function.

Within 1 week after fixation, the physician massages the patient with wine in stages because exuded blood and tissue fluids restricted the return of flow of blood and lymph to cause blood stasis, swelling, *Qi* stagnation and pain. spouting-wine massage is conducted using: the pressing method and separating method at the site of the pressure pad; with the grasping method and poking method at the site fixed with small splints; the rubbing method and fouflage in the gap of small splints; the twirling method and pushing method at the site of blood stasis and swelling to improve blood circulation of hyperplastic blood vessels in the periosteum.

Two weeks later, tendons and bones return to normal, blood stasis and swelling gradually vanish, and pain is alleviated. Massage is undertaken with the pressing method and kneading method at the fracture and joint, and with the poking method, rubbing method, kneading method, embedding method and fingernail pressing method at the points of Ganshu (BL 18) and Shenshu (BL 23)<sup>13</sup> to activate the blood vessels in bones and promote hyperplasia of newly generated bony cells, calcification and porosis.

Early functional exercise often creates a good physiological environment for fracture healing.<sup>14</sup> Hence, fracture healing with osteopathy in TMM follows the norm of considering physiological healing and psychological function.

#### ***Norm of considering limb healing and motion***

Biomechanical theory in orthopedics shows<sup>10,15</sup> that carrying out limb healing and motor-functional exercise progressively is important for fracture healing and functional restoration. Eliminating swelling and alleviating pain in fractures makes moving positions and repairing soft tissue quite difficult. Hence, osteopathy in TMM relies on wine-spouting massage<sup>13</sup> to the joints of the affected limb using the pressing method, shaking method and fouflage; to the fracture site with the rolling method, poking method and kneading method; to the site of the affected limb with the jolting method, shaking method and fouflage; and to the points of Pishu (BL 20), Weishu (BL 21) and Sanjiaoshu (BL 22) with the kneading method, jolting method and embedding method to activate blood circulation in bones, promote porosis and calcification, and to accelerate limb healing.

With *Qi* and blood flowing smoothly, soft tissue repaired, and tendons and bones improved, the patient is

encouraged to undertake functional exercise to promote fracture healing and enhance the stability of limb function as well as the balance between osteoblasts and osteoclasts. According to the stress equation of fracture healing,<sup>8,14</sup> physiological stress of fracture ends can be expressed using the following equation:

$$\sigma = \frac{G_x}{2A_0} \sin 2\alpha + \frac{1}{2A_0} [G_g \sin 2\alpha + N(1 + \cos 2\alpha)] \quad (1)$$

Where N is the axial force of diaphysis,  $G_x$  is the bandaging force without functional activity,  $G_g$  is the bandaging force with functional activity,  $\alpha$  is the angle between the fracture and diaphysis line, and  $A_0$  is the transversal surface of the diaphysis.

In equation (1), the first term is constant physiological stress obtained in the static and motion state of the fracture end. It can increase frictional force, decrease shearing force, promote close embedment between bony sections, shorten the crawling distance of newly generated bony cells, and accelerate fracture healing. The second term is intermittent physiological stress obtained only in the motion state of the fracture end. It is favorable for osteoblastic motion and unfavorable for osteoclastic motion to promote stable balance between osteoblasts and osteoclasts. Reciprocal causation between limb healing and stress adaptation creates a suitable stress environment for the functional stability of limb healing.<sup>8,14</sup>

For enhancing the stability of motion function of limbs, intermittent physiological stress obtained at the fracture ends in stable motion function is expressed in equation (2).

$$\sigma_g = \frac{1}{2A_0} [G_g \sin 2\alpha + N(1 + \cos 2\alpha)] \quad (2)$$

Reciprocal causation between stable limb motion and stress adaptation creates a suitable stress environment for the motion of the limb.<sup>8,14</sup>

Progressive functional exercise often creates a good environment for the stress adaptation for fracture healing.<sup>8,16</sup> Thus, fracture healing with osteopathy in TMM follows the norm of considering limb healing and motion.

## **CONCLUSION**

Based on the naturalism of the integration of limbs and the body, unification of the body and function, and harmony of man and nature (including psychosomatic integration), fracture healing with osteopathy in TMM involves a macro-concept and manipulation of the functional healing of fractures. Based on the natural norm of life with regard to the continuity of bony structure and wholeness of function, fracture healing with osteopathy in TMM follows the norm of considering physiological healing and psychological function as well as limb healing and motion. This therapy makes the principle of fracture healing develop in the direction of wholeness, dynamic state and functionalism.

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