

TREATMENT OF TRAUMATIC LIMB EDEMA IN ORTHOPEDICS BASED ON THE THEORY OF  
"BLOOD STASIS LEADS TO WATER RETENTION"

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**Abstract**

Blood stasis leads to water retention" is a classic theory in Traditional Chinese Medicine (TCM) proposed in the ancient text "Synopsis of the Golden Chamber". This academic concept has traditionally been applied primarily in gynecological clinical diagnosis and treatment. In recent years, this theory has been widely applied in treating traumatic limb edema in orthopedics, demonstrating significant efficacy with minimal adverse reactions. This paper presents a preliminary discussion on the application of this theory in treating traumatic limb edema in orthopedics.

**Keywords:** Qi disease; Blood stasis; water retention; Traumatic edema; TCM

**List of Abbreviations:** TCM = Traditional Chinese Medicine (Traditional Chinese Medicine)

**Introduction**

Zhang Zhongjing's "Synopsis of the Golden Chamber, Chapter 14 on Water Qi Disease Pulse Symptoms and Treatment" (Wang Yuzeng, 2014) states: "A sunken and slow pulse at the inch opening indicates water retention and cold, respectively, with cold and water conflicting. A hidden pulse at Fuyang indicates undigested food and water, with weakened spleen qi leading to diarrhea and weakened stomach qi causing body swelling. A low Shaoyang pulse and a fine Shaoyin pulse indicate urinary difficulty in men and menstrual blockage in women. Menstruation is blood, and when blood does not flow smoothly, it leads to water retention, termed blood division." This passage discusses the pathogenesis of water qi disease through pulse diagnosis, providing significant clinical guidance for treating traumatic limb edema in orthopedics using the "activating blood and promoting diuresis" method. In orthopedics, traumatic limb edema is considered a result from local bone fractures and tendon injuries due to trauma, causing blood to leave its vessels, leading to blood stasis and qi stagnation. This further impairs blood and qi circulation, ultimately resulting in fluid retention.

Direct or indirect violence can damage limb bones, tissues, and vessels, causing bone fractures and tendon injuries. Blood leaves its vessels, extravasating into tissues, leading to local blood and qi circulation disorders, blood stasis, qi stagnation, and fluid retention, resulting in swelling. He Mengyao's "Medical Compendium - Swelling" states: "Qi, blood, and water are often interrelated in diseases. Some cases begin with qi stagnation followed by blood stasis, while

others start with blood stasis leading to qi stagnation. Some cases initiate with water retention causing blood deterioration, while others begin with blood stasis resulting in water retention." (Zhu Yi, 2012) Wu Qian et al.'s "Yi Zong Jin Jian Nei Zheng Miscellaneous Treatment (Golden Mirror of Medicine - Miscellaneous Internal Disease Treatments)" notes: "Symptoms of blood stasis due to injury are caused by falls and blood stagnation. Qi flows and stays, while blood stays and congeals, either in the limb joints, chest, abdomen, waist, or buttocks, causing diffuse swelling or masses." (Chen Liguang and Guo Yanxing, 2018) Tang Rongchuan's "Treatise on Blood Syndromes" states: "In cases of falls and injuries without skin breakage, blood damage occurs, causing swelling and pain in the muscles." "Blood stasis transforming into water can also cause edema." (Bai Chaowei, 2007) When blood stasis occurs, water is difficult to transform, and when water obstructs, blood circulation is impaired. The pathogenesis of traumatic limb edema is essentially "mutual obstruction of stasis and water."

Fractures caused by external injuries are often accompanied by limb edema, and most fractures require surgical treatment. In certain fracture locations, such as tibial plateau fractures, calcaneal fractures, pilon fractures, tibial and fibular shaft fractures, ulnar and radial shaft fractures, and olecranon fractures, surgery is typically delayed until the swelling subsides and skin wrinkles appear at the injury site. This optimal surgical timing usually occurs 12 days post-injury. Severe cases may develop compartment syndrome, which can lead to disability if not treated promptly. The challenge of reducing swelling quickly, shortening the pre-operative waiting period, and performing surgery as early as possible for patients has been a constant consideration.

In traditional Chinese medicine treatment of fractures, the early stage typically focuses on resolving qi stagnation and blood stasis. However, external injuries cause blood to leave vessels, resulting in internal blood stasis, obstructed qi mechanisms, and impaired fluid metabolism. This leads to fluid retention, which further impedes blood circulation. Through long-term clinical practice in orthopedics, we have observed that patients with traumatic limb edema often develop tension blisters shortly after injury. Some patients exhibit significant wound exudation, and emergency surgery reveals large amounts of interstitial fluid in swollen tissues. We consider these manifestations of "water retention." Therefore, we believe the pathogenesis of traumatic limb edema involves "mutual obstruction of water and blood stasis." Post-trauma damage to limb meridians and blood vessels causes blood to leave vessels, forming stasis. This internal obstruction leads to blockage of meridians and water-dampness retention, forming the basic pathogenesis of limb edema. Blood stasis impedes water metabolism, while water obstruction hinders blood flow, necessitating simultaneous treatment of both stasis and water retention. Based on this understanding, Director Liu Jincai developed a treatment method to activate blood circulation, resolve stasis, promote diuresis, and reduce swelling. This approach addresses traumatic limb edema from the perspective of mutual obstruction of water and blood stasis. Self-formulated upper and lower limb de-swelling prescriptions were created. In these formulas, Zeland (*Lycopus lucidus*) both activates blood and resolves stasis while promoting water metabolism and reducing swelling. Phellodendron, Coix seed, and Atractylodes promote diuresis and eliminate dampness. Frankincense, myrrh, processed rhubarb, *Salvia miltiorrhiza*, and Corydalis promote qi circulation and activate blood. Notopterygium and *Angelica pubescens* target the upper and lower limbs, respectively, to eliminate dampness and unblock meridians. The combination of these herbs promotes qi and blood circulation while eliminating water and dampness, leading to rapid reduction of limb edema.

Upper limb de-swelling formula: Zeland, Phellodendron, Coix seed, Atractylodes, frankincense, myrrh, processed rhubarb, *Salvia miltiorrhiza*, Corydalis, Notopterygium, mulberry twigs, etc. Lower limb de-swelling formula: Zeland, Phellodendron, Coix seed, Atractylodes, frankincense, myrrh, processed rhubarb, *Salvia miltiorrhiza*, Corydalis, *Angelica pubescens*, *Achyranthes bidentata*, etc.

Director Liu Jincai believes that treating traumatic limb edema in orthopedics should equally emphasize activating blood circulation, resolving stasis, promoting diuresis, and reducing swelling. Only when qi and blood circulation gradually improve and water-dampness is eliminated can swelling significantly subside. Consideration should also be given to differences in injury location, constitution, age, yin-yang imbalances, time of injury, severity, diet, and medication use. Based on the foundation of addressing "stasis," differentiation between cold and heat patterns should be

made, with attention to selecting channel-guiding herbs to directly target the affected area or using syndrome differentiation for optimal results. The department's application of limb de-swelling formulas in treating traumatic limb edema has shown significant efficacy, with a few patients experiencing diarrhea, which was resolved by adjusting the dosage of rhubarb.

The academic concept of "blood stasis leads to water retention" has been widely applied in treating trauma patients in our department. In clinical practice, we often combine this approach with conventional physical therapies to promote the reduction of limb edema. Specific measures include:

1. In the initial post-trauma period, rest and minimize limb movement. Apply ice or cold compresses to reduce swelling and pain.
2. Elevate the affected limb using pillows or supports to reduce swelling.
3. Use pressure bandages: Appropriate use of elastic bandages can compress tissues and the lymphatic system, aiding in fluid drainage, effectively alleviating swelling symptoms, and accelerating recovery.
4. Perform physical therapy, such as massage and manipulation, to promote blood circulation and lymphatic drainage, accelerating the resolution of swelling.
5. Implement a rational diet control, avoiding excessive salt intake and overeating to prevent exacerbation of edema.
6. Follow medical guidance and take prescribed medications, such as diuretics and anti-inflammatory drugs, to help eliminate excess body fluid and reduce inflammatory responses.
7. Engage in timely rehabilitation training, including functional exercises, muscle strengthening, and joint mobility recovery, to promote limb function restoration and edema reduction.

These treatment methods can effectively shorten the duration of traumatic limb edema and alleviate patients' symptoms and discomfort. This approach also represents further research and practical application of the pulse and symptom theory proposed in Zhang Zhongjing's "Synopsis of the Golden Chamber, Chapter 14 on Water Qi Disease Pulse Symptoms and Treatment," applying it to clinical treatment and providing significant clinical guidance for treating traumatic limb edema in orthopedics.

**Ethical Clearance Statement:** This study was approved by the Ethics Committee of Chuxiong Prefecture Hospital of Traditional Chinese Medicine (Approval number:20240712005 ) ; Approval Date:12 July 2024. All procedures involving human participants were conducted in accordance with the Declaration of Helsinki and its later amendments.

**Conflict of Interest Statement:** The authors declare there is no conflicts of interest associated with this study.

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