Observational Study on the Effective Treatment of Humeral Neck Fracture in the Medicine of Mongolia

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Abstract

Objective: This study aims to study the methods and effects of humeral neck fracture treatment with osteopathy in traditional Mongolian medicine. Methods: 60 patients who were admitted and got treatment for the humeral neck fracture at the Osteopathic Department of the First State Central Hospital of Mongolia from July 2023 to June 2024 were selected for the sample of the study. The patients were grouped in two randomly. The surgical internal fixation was performed for the patients in the conventional group, while the traditional Mongolian bone setting practice was performed for the patients in the experimental group. The pain, swelling, callus formation period, fracture healing period, and joint function of the two groups of patients were analyzed and compared. Results: The patients in the experimental group had significantly less pain and swelling at different periods after the surgery than those in the conventional group. The data comparison was statistically significant, P<0.05. The callus formation period of the experimental group was obviously shorter than that of the conventional group, and the comparison of the data is statistically significant at P<0.05. The joint function, fracture healing, and joint regeneration of patients in the experimental group were better than those in the conventional group, P<0.05. Conclusion: It was found that the traditional Mongolian osteopathic treatment method is effective in treating the humeral neck fracture, and it not only reduces the symptoms of pain and swelling of the joints after surgery but also helps the injury heal quickly.

Keywords

Mongolian medicine, Humeral neck fracture

Proximal humerus fractures are common fractures often seen in elderly patients with osteoporotic bone. Humeral neck fracture belongs to the upper extremity, so the pain is severe and has a serious impact on daily normal life and work. If the humeral neck is not treated promptly and effectively, it can cause permanent damage to the limb function [1]. Conventional treatment methods mainly include surgical treatment and conservative or nonoperative management treatment. The surgical treatment is widely used because of its rapid recovery and obvious effectiveness [2]. However, the surgical treatment is not only expensive, but also accompanied by surgical risks and postoperative complications, so the importance of this study is to explore an alternative treatment method that is safer, economical, and effective [3]. Among the various treatment approaches, the Chinese and Mongolian treatment methods for bone fracture have been relatively widely used among the Mongolians, and theoretically and practically, the non-surgical approach, which is to put the broken bone in place manually, not only reduces the risk and complications but also
helps the fracture heal quickly [4]. Although traditional treatment method is increasingly used for the treatment of various types of bone fractures, a method of fracture healing with osteopathy in traditional Mongolian medicine continues to attract attention over time. There is still a need for clinical research on fracture healing with osteopathy in traditional Mongolian medicine. In this regard, this study aims to conduct retrospective analyses on the results of treatment made for 60 patients who were admitted and got treatment for the humeral neck fracture. The patients were randomly categorized into two groups, including the conventional group and fracture healing with osteopathy in the traditional Mongolian medicine group, and the pain, swelling, callus formation period, fracture healing period, and joint function of the two groups of patients were analyzed and compared. In doing so, we believe that a more comprehensive therapeutic rationale will be established in the treatment of humeral neck fracture.

1. Materials and methods

60 patients with humeral neck fractures who were admitted and got osteopathy in traditional Mongolian medicine at the Osteopathic Department of the First State Central Hospital of Mongolia from July 2023 to June 2024 were selected as the study sample, and divided into two groups randomly. The experimental group consisted of 30 patients, 16 men and 14 women, aged 22-54 years (average age is 38.41±3.61). In the conventional group, there were 30 patients, 17 men and 13 women, aged 22-55 years (average age is 37.57±2.80). There is no significant difference in baseline data, P>0.05.

Standard criteria for diagnosis: whether there is a history of injury in accordance with "Mongolian Medical Diagnosis and Treatment Outcome Standards" and "Chinese Traditional Medicine Industry Standards", the fracture of the humeral neck caused by external influences is recognizable by palpation, and there is swelling and limited mobility; it is diagnosed based on the amount of swelling, mobility is basically or completely limited, there is changes in bone structure and it has a tension pain; it is caused by external influences; a fracture of humeral neck was detected by x-ray imaging.

Inclusion in the study: patients who are 8-75 years old, regardless of gender, diagnosed with a fracture of the humeral neck, which is confirmed by the Mongolian fracture diagnosis standards, and signed the consent to participate in the study voluntarily.

Exclusion from the study: patients with external wounds and infections; patients with abnormal cardiovascular, liver, kidney function, cancer, respiratory diseases, blood system, and other diseases; patients under 8 years old and over 75 years old; others who refused to participate in the study.

1.1 In the conventional group, surgical internal fixation was used

Methods: The patient is placed in the supine position under partial or general anesthesia to ensure the patient’s comfortable position, and an incision is made on the skin of the humerus, and the length of the incision is decided based on the size of the fracture. The muscle and soft tissues are separated from the fractured part to expose the fractured bone without damaging the surrounding tissue. The fractured bone is carefully repositioned and aligned. Suitable steel plates and screws are selected, and the steel plate is fixed on the humerus with the screws to ensure its stability. In order to ensure the accuracy and stability of the internal fixation, the position of the steel plate and screws, as well as the position of the bone are checked using a C-shaped X-ray. After ensuring that the fractured bone and internal fixation are in stable and right position, the incision is sutured in each layer, including muscle, subcutaneous tissue, and skin.

1.2 In the experimental group, the traditional Mongolian osteopathic treatment was performed

Methods: (1) The fractured bone is put in place in hand. For patients with adduction-type fractures, the fracture is fixed by pressing the patient’s shoulder with one hand and pulling and pushing the end of the fracture, the top of the elbow joint, with the other hand. Put more stress on the bulging area, which puts stress on the inside of the fractured end. For patients with abduction type fractures, hold the patient's axilla with one hand and hold the end of the fracture with the other hand, and fix the bone by pulling and pushing with hands. Put stress under the armpit and at the end of the fracture. (2) Splint immobilization is put on the outside of the limb, regardless of adduction or abduction-type fractures, for 2-4 weeks. The splint is adjusted in consideration of the patient’s weight. (3) Alcohol spouting massage. Spray the injured area with alcohol specially prepared by Mongolian medicine, and put slings immobilization to reduce swelling and improve blood circulation. The alcohol massage increases the healing process by relieving pain and improving blood circulation. (4) Use an adjustable material such as wood, cotton, etc. that cannot block the blood circulation and airflow to ensure the patient is comfortable. (5) Other methods. It varies depending
on the patient’s recovery condition during the treatment, which includes initial adjustment, joint rehabilitation exercises, and strength exercises. During the treatment, the fracture healing and recovery of joint function should be regularly checked and evaluated, and the treatment methods should be redetermined, including redefining the duration of external fixation or increasing the joint exercises, etc. Also, the patient’s recovery condition, especially skin irritation, splint adjustment and discomfort response are carefully monitored on a regular basis to provide safe and effective treatment.

1.3 Assessment of effectiveness

The pain, swelling, callus formation period, fracture healing period, and joint function of the two groups of patients were analyzed and compared.

The pain level is assessed based on the VAS measurement method, which has a positive correlation with the pain scores. The degree of swelling is evaluated on 4 levels. A higher score indicates severe swelling.

The joint function is assessed based on the Contant-Murley shoulder joint and scored on a scale of 0-140. A higher score indicates better joint function.

1.4 Statistical analysis

The statistical analysis was conducted by SPSS 22.0. As for the statistical data, measurement data was determined using the number of cases and percentage (%) and t analysis was used, while as for the count data, $X^2$ analysis was used, and $p>0.05$ means no statistical difference. Comparisons between groups were made using the t-test. $P<0.05$ means that the difference is statistically significant.

2. Results

2.1 Comparison of pain and swelling levels

Patients in the experimental group had significantly less pain and swelling after the surgery than those in the conventional group. Quantitative data comparisons were statistically significant, $P<0.05$. For details, please refer to Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pain level</th>
<th>Swelling level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 day after surgery</td>
<td>3 days after surgery</td>
</tr>
<tr>
<td>Experimental group (n=30)</td>
<td>4.20±0.21</td>
<td>3.04±0.13</td>
</tr>
<tr>
<td>Conventional group (n=30)</td>
<td>6.14±0.52</td>
<td>5.40±0.16</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

2.2 Comparison of callus formation period

The callus formation period for patients in the experimental group was significantly shorter than that of the conventional group, and the data comparison was statistically significant, $P<0.05$. For details, please refer to Table 2.

<table>
<thead>
<tr>
<th>Group</th>
<th>Callus formation period (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group (n=30)</td>
<td>17.61±2.50</td>
</tr>
<tr>
<td>Conventional group (n=30)</td>
<td>22.45±3.54</td>
</tr>
<tr>
<td>T</td>
<td>13.158</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

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2.3 Comparison of joint function parameters

The joint function scores of patients in the experimental group were significantly better than those in the conventional group during the healing and joint function recovery period, P<0.05. For details, please refer to Table 3.

<table>
<thead>
<tr>
<th>Group</th>
<th>Joint function score during the recovery period</th>
<th>Joint function recovery score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group (n=30)</td>
<td>71.24±5.61</td>
<td>102.41±6.05</td>
</tr>
<tr>
<td>Conventional group (n=30)</td>
<td>52.41±6.35</td>
<td>76.34±4.81</td>
</tr>
<tr>
<td>T</td>
<td>10.241</td>
<td>13.574</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

3. Discussion

The humeral neck fracture is located 2-3 cm below the neck and occurs in soft tissue and bone grafts. Fracture of this part is common in clinical practice due to the anatomical features [5]. Post-fracture interarticular grooves are uneven and an injury to the head of the triceps of the humeral shaft is accompanied. Also, joint dislocation occurs, which makes the treatment complicated. The humeral neck fractures occur not only in all age groups, but are also common in the elderly, especially in people over 60 years of age, and the number of cases has been increasing, and it occupies 70% of the fractures of the upper limb [6]. Improper treatment methods and long-term immobilization cause malfunction of the shoulder joint and upper limb, having a serious impact on the patient's normal life.

In modern medicine, the proximal humerus fractures are classified into Neer and AO, among which the Neer classification system remains the most widely used in clinical practice [7]. According to the Neer classification, fractures are divided into four types, and an increase in grade from 1 to 4 indicates the severity of the fracture. The selection of the optimal treatment method is significant for the healing of the fracture. Particularly, the choice of fixation method can be influenced by many factors, such as the type of fracture and the patient's psychological status, which aims to cause less damage, stable fixation, and faster recovery [8]. Although the surgical method, internal fixation, increases stability to some extent, it may cause more soft tissue damage and impair fracture healing.

The Mongolian traditional treatment methods have shown unique advantages in diagnosis and treatment of various bone fractures. The Mongolian traditional bone fracture treatment is based on 3 principles: "Three diagnoses, six principles, and nine combinations" and has the advantages of manual rehabilitation, external fixation, less pain, faster recovery, and faster return to normal condition [9]. Especially in the treatment of complicated fracture patterns such as the fracture of the upper part of the humerus, the traditional Mongolian osteopathic treatment improves the fracture healing process and allows early exercises, so it is widely preferred and accepted by domestic and foreign surgeons.

The traditional Mongolian osteopathic method and its therapeutic value is clearly effective than other types of similar treatments. The treatment method is based on the principle of "Three diagnoses, six principles, and nine combinations" and provides comprehensive treatment of internal and external factors. It is beneficial to restore the patient's "spirit, behavior, and psychology" and adjust the “three roots” and “seven elements” of the body [11]. The combination of massage and traditional Mongolian medicine supports kidney function, nourishes the kidney, and strengthens the muscles and bones, which are the unique advantages of the Mongolian osteopathic treatment method [12]. The traditional Mongolian osteopathic treatment is easy, safe, reliable, and functional, and has a short-term healing process and fewer complications, as well as prevents re-injury, incision infection, and secondary surgery to remove internal fixation, which has a positive effect on patients' economy, physics, and psychology [13]. Therefore, the development and spread of traditional Mongolian treatment is not only of broad cultural significance but also has practical significance for improving the effectiveness of the modern medical system and treatment and reducing the side effects and costs of treatment [14]. In the case of a fracture of the upper part of the humerus, the combined treatment of hands, external fixation, and alcohol-spouting massage with the domestic and foreign treatment methods can effectively support fracture healing and accelerate healing. It shortens the fractures healing, significantly reduces post-operative pain and stiffness, prevents joint stiffness and muscle atrophy due to long-term immobility, and has a positive effect on the patient's daily life and enables normal functioning [15]. In addition, the traditional Mongolian osteopathic treatment not only restore the joint function, but also focuses on the general physical and mental health of the patient and emphasizes the restoration of "spirit, behavior and psychology", which have a

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positive impact on the quality of life of the patient. This multifaceted and comprehensive treatment approach makes traditional Mongolian osteopathic treatment and clinical application more valuable and provides a more humane and comprehensive treatment for fractures and other diseases.

According to the results of this study, the patients in the experimental group had significantly lower levels of pain and swelling than those in the conventional group after surgery. Data comparisons were statistically significant or P<0.05. The callus formation period of the patients in the experimental group was significantly shorter than that of the conventional group, and the data comparison was statistically significant at P<0.05. The joint function, fracture healing, and recovery of the patients in the experimental group was better than that of the conventional group, P<0.05. These results prove that the traditional Mongolian osteopathic treatment not only significantly reduces post-operative pain and swelling, but also accelerates the healing of bone fractures and significantly improves joint function during the recovery period.

4. Conclusion

In conclusion, the traditional Mongolian osteopathic treatment has significant advantages in the treatment of bone and bone fractures as a non-surgical treatment method. It not only effectively reduces post-operative discomfort of patients and accelerates fracture healing, but also improves the overall effectiveness of treatment by shortening the recovery time of patients. Thus, it is concluded that this treatment method is highly valuable in bone fractures.

References


