

# Clinical Treatment Outcomes of Primary Shoulder Periarthritis Managed with Electroacupuncture and Therapeutic Exercises: A Study at Hai Phong Medical University Hospital, 2024 – 2025

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## ABSTRACT

**Objectives:** To evaluate the treatment outcomes of patients with primary periarthritis of the shoulder treated with electroacupuncture (EA) combined with therapeutic exercises at Hai Phong Medical University Hospital during 2024–2025.

**Methods:** A clinical interventional study with a before–and–after comparison design. **Results:** Pain scores according to the Constant and Murley scale increased from  $3.94 \pm 3.69$  points to  $14.09 \pm 1.96$  points. Range of motion (ROM) for flexion increased from  $96.21 \pm 34.71^\circ$  to  $161.97 \pm 21.21^\circ$ . ROM for abduction increased from  $101.06 \pm 35.28^\circ$  to  $161.36 \pm 20.93^\circ$ . External rotation increased from  $4.24 \pm 1.92$  points to  $9.52 \pm 1.42$  points. Internal rotation increased from  $4.73 \pm 1.72$  points to  $9.39 \pm 1.46$  points. Activities of daily living (ADL) scores improved from  $7.76 \pm 2.37$  to  $19.00 \pm 2.65$  points. Shoulder strength (Constant and Murley) increased from  $3.58 \pm 2.92$  to  $8.18 \pm 2.63$  points. Ultrasound demonstrated a reduction of joint effusion in up to 90.9% of patients. Overall treatment efficacy (Good + Fair) reached 94%. **Conclusion:** EA combined with therapeutic exercises reduces pain, improves shoulder range of motion and muscle strength, and decreases shoulder joint effusion on ultrasound. This approach is safe, easy to perform, and cost-effective for patients with periarthritis of the shoulder.

**Keywords:** Shoulder periarthritis; primary periarthritis; clinical characteristics.

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## INTRODUCTION

Periarthritis of the shoulder refers to inflammatory disorders and shoulder pain caused by soft tissue lesions (tendons, muscles, ligaments, bursae, joint capsule) without damage to cartilage or bone and not due to infection [1]. The condition is classified into four clinical forms; primary periarthritis is the most common, mainly involving lesions of the supraspinatus tendon or tendinitis of the long head of the biceps tendon [2]. Although periarthritis of

the shoulder is not life-threatening, it significantly affects patients' labor and daily activities. The disease usually lasts from six months to several years. If not treated promptly and properly from the start, it can leave sequelae such as muscle atrophy, decreased muscle tone, limited shoulder and hand motion, tendon rupture leading to progressive loss of function on the affected side, affecting daily activities, work, and rest. The recurrence rate after full recovery is about 20% [2].

In Vietnam, several studies have evaluated treatments for shoulder periarthritis, such as ultrasound therapy combined with EA or aquapuncture combined with EA. Clinical practice has shown that combining different therapeutic methods often yields better results [2]. EA stimulates acupoints via insertion needles with electrical stimulation; it has analgesic effects, inhibits pain, stimulates muscle activity and local tissue nutrition, and reduces inflammation, hyperemia, and local edema [3]. However, selecting an optimal method that provides high efficacy for patients, is convenient and easy for healthcare staff to perform, and reduces time and economic burdens for patients and society remains necessary. Finding additional combined treatment methods gives patients and clinicians more options. Therapeutic exercise (physiotherapy) uses movement to help patients recover function so they can resume work, recreation, and independent daily living. Therapeutic exercise effectively increases the range of motion [3]. Combining EA with therapeutic exercise integrates modern medicine and traditional medicine approaches and represents a multimodal treatment strategy to enhance therapeutic outcomes. To scientifically assess the effect of this combined approach, we conducted this study with the objectives: To evaluate treatment outcomes of EA combined with therapeutic exercises in patients with primary shoulder periarthritis at Hai Phong University Hospital in 2024–2025.

## SUBJECT AND METHODS

**Study design:** Clinical interventional study with before–and–after comparison.

**Study site and period:** The study was conducted at the Department of Traditional

Medicine, Hai Phong University of Medicine and Pharmacy Hospital from November 2024 to April 2025.

**Study subjects:** Patients with primary periarthritis of the shoulder who met the inclusion criteria: Patients aged 18 years or older, any gender, consenting to participate, and meeting the following *diagnostic criteria*:

- Clinically diagnosed as primary painful shoulder periarthritis according to M.C. Boissier (1992) [4] and Nguyen Thi Ngoc Lan [4].

- Ultrasound may show signs of long head of biceps tendinitis and/or supraspinatus tendinitis. A conventional shoulder X-ray usually does not detect joint damage but may show tendon calcification.

*Exclusion criteria:*

- Acute painful type, pseudo-paralysis type, or frozen shoulder type of periarthritis.

- Scapulohumeral joint lesions due to other causes: tumors (lung, breast), coronary insufficiency, cervical radiculopathy C5, etc.

- Shoulder pain and movement limitation due to other causes: hemiplegia from stroke, trauma, dislocation, shoulder osteoarthritis, avascular necrosis of the humeral head, etc.

- Patients with language disorders or psychiatric disorders preventing proper evaluation.

**Sample size:** Convenience sampling; all patients meeting the inclusion criteria were enrolled, total n = 33.

**Outcome measures and evaluation**

**criteria:** The Constant C.R. and Murley A.H.G. (1987) scoring system was used. The Constant-Murley score (CMS) is a 100-points scale composed of a number of individual parameters. These parameters define the level of pain and the ability to carry out the normal daily activities of the patient. The Constant-Murley score was

introduced to determine the functionality after the treatment of a shoulder injury. The test is divided into four subscales: pain (15 points), activities of daily living (20 points), strength (25 points) and range of motion: forward elevation, external rotation, abduction and internal rotation of the shoulder (40 points). The higher the score, the higher the quality of the function. Overall treatment effectiveness was calculated as follows:

$$\text{Treatment effectiveness} = \frac{\left| \begin{array}{l} \text{Total score} \\ \text{after} \\ \text{treatment} \end{array} - \begin{array}{l} \text{Total score} \\ \text{before} \\ \text{treatment} \end{array} \right|}{100 - \begin{array}{l} \text{Total} \\ \text{score} \\ \text{before} \\ \text{treatment} \end{array}} \times 100\%$$

Classification of treatment response:

- Good: Treatment effectiveness  $\geq 75\%$
- Fair:  $50\% \leq \text{Treatment effectiveness} < 75\%$
- Average:  $25\% \leq \text{Treatment effectiveness} < 50\%$
- Poor: effectiveness  $< 25\%$

### Acupoint Prescription and Rehabilitation Protocol

The acupoint prescription applied in this intervention followed the guidelines of the Ministry of Health, including: Jianzhen (SI9), Jianliao (TE14), Tianzong (SI11), Jianyu (LI15), Binao (LI14), Quchi (LI11), Hegu (LI4), and Waiguan (TE5).

The rehabilitation program consisted of therapeutic exercises such as shoulder joint mobilization, pendulum exercises, cross-arm stretching, wall-climbing exercises, and lying-position stretching. These exercises were initiated on the second day of treatment.

The combined regimen of electroacupuncture and therapeutic exercise was administered once daily, six days per week, over a period of two weeks (excluding Sundays).

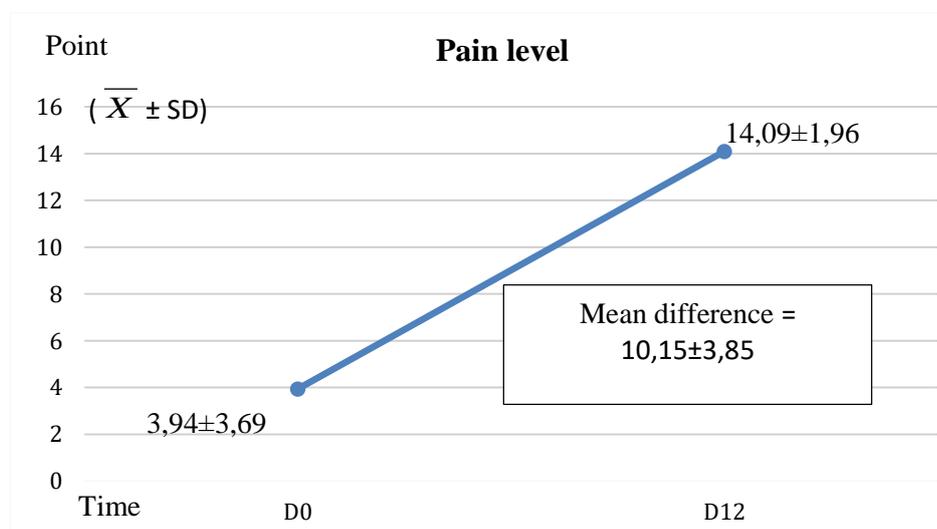
### Techniques, instruments, and data collection procedures

Data were collected using the research medical record form at the time the patient presented to the hospital.

**Data processing and analysis:** Data were processed using SPSS 22.0 and Excel 2016; descriptive statistics and percentages were used for analysis.

## RESULTS

### Pain Reduction Effectiveness According to the Constant-Murley Score



**Figure 1.** Pain reduction according to the Constant and Murley (1987) scale

After 12 days of treatment, the mean pain score of patients increased, corresponding to a reduction in pain severity. The difference was statistically significant ( $p < 0.05$ ).

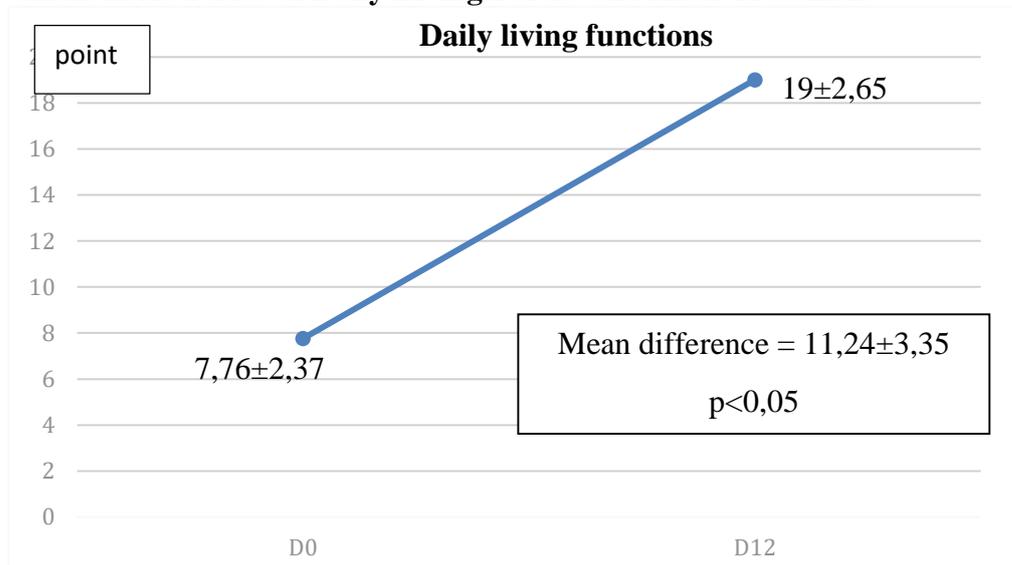
**Effectiveness of Range of Motion Improvement According to the Constant-Murley Score**

**Table 1.** Changes in shoulder range of motion before and after treatment according to Constant and Murley (1987)

| Range of motion            | Before treatment | After treatment  | p                |
|----------------------------|------------------|------------------|------------------|
| Flexion (°)                | 96,21±34,71      | 161,97±21,21     | < 0,05           |
| Abduction (°)              | 101,06 ± 35,28   | 161,36 ± 20,93   | < 0,05           |
| External rotation (points) | 4,24±1,92        | 9,52±1,42        | < 0,05           |
| Internal rotation (points) | <b>4,73±1,72</b> | <b>9,39±1,46</b> | <b>&lt; 0,05</b> |

After 12 days of treatment, the mean shoulder ROM in the study patients improved significantly ( $p < 0.05$ ).

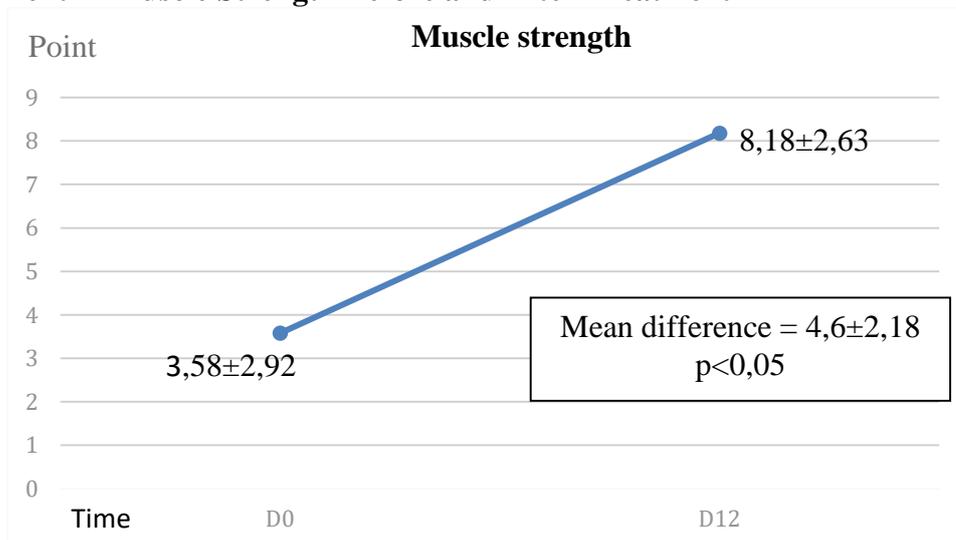
**Improvement in Activities of Daily Living Before and After Treatment**



**Figure 2.** Changes in activities of daily living before and after treatment

After 12 days of treatment, patients' ADL function improved significantly ( $p < 0.05$ ).

**Improvement in Muscle Strength Before and After Treatment**



**Figure 3.** Changes in shoulder strength before and after treatment  
Shoulder strength improved markedly after 12 days of treatment ( $p < 0.05$ ).

### Improvement in Shoulder Joint Effusion on Ultrasound

**Table 2.** Change in ultrasound-measured effusion after treatment

| Ultrasound result | Number (n) | Percentage (%) |
|-------------------|------------|----------------|
| Resolved          | 17         | 51,5           |
| Reduced           | 13         | 39,4           |
| Increased         | 3          | 9,1            |
| <b>Total</b>      | <b>33</b>  | <b>100</b>     |

After 12 days of treatment, 90.9% of patients had resolved or reduced effusion on ultrasound ( $p < 0.05$ ).

### Overall Treatment Effectiveness in the Study Group

**Table 3.** Overall treatment outcomes of patients

| Effectiveness | Number (n) | Percentage (%) |
|---------------|------------|----------------|
| Good          | 16         | 48,5           |
| Fair          | 15         | 45,5           |
| Average       | 2          | 6              |
| Poor          | 0          | 0              |
| <b>Total</b>  | <b>33</b>  | <b>100</b>     |

After 12 days of treatment, the combined rate of good and fair outcomes reached 94%.

## DISCUSSION

From a biomedical perspective, EA mediates analgesia via neural and humoral mechanisms. From the perspective of traditional medicine, pain results from stagnation of qi and blood; EA promotes the body's self-regulatory ability, restores normal physiological function, and promotes circulation of qi and blood, thereby alleviating pain [5]. Primary periarthritis accounts for up to 90% of shoulder periarthritis cases, and its main symptom is pain with limitation of active shoulder motion [9]. Our results align with the hypothesis that therapeutic exercises combined with EA markedly improve active shoulder ROM. In some patients, active motion limitation is largely due to pain; by reducing pain, EA contributes to increased active ROM. Moreover, shoulder exercises were designed

to increase strength, flexibility, and motor control of the involved muscle groups, thereby increasing active shoulder ROM.

The improvement in the activities of daily living score used in our study reflects the impact of primary periarthritis on patients' activities such as work, recreation, sleep, and hand position. In our study, the mean ADL score before treatment was  $7.76 \pm 2.37$  points and increased to  $19.00 \pm 2.65$  points after 12 days of treatment ( $p < 0.05$ ). Thus, EA combined with therapeutic exercises both reduced pain and inflammation of the tendons, increased ROM, and consequently improved patients' muscle strength and daily function. Before treatment, the mean shoulder strength score was  $3.58 \pm 2.92$  points; after 12 days, it increased to  $8.18 \pm 2.63$  points. The post-treatment improvement was statistically significant ( $p < 0.05$ ).  
Comparative studies: Nghiem Thi Minh Thao

(2018) using Meridian-Tendon therapy reported shoulder strength increasing from  $7.27 \pm 1.92$  to  $19.33 \pm 4.71$  after 20 days of treatment [6]. Nghiem Thi Thu Thuy (2021) reported an increase in shoulder strength from  $6.13 \pm 0.85$  to  $8.53 \pm 0.82$  after 15 days of treatment [7]. Assessing shoulder strength in the treatment of periarthritis is essential because weak shoulder muscles prolong recovery time for ROM. If treatment only improves pain and ROM but not strength, shoulder function may not fully recover. Moreover, stronger shoulder muscles help maintain treatment outcomes and reduce the risk of recurrence.

We used the Constant and Murley (1987) scoring system to evaluate treatment effectiveness. The test includes four subscales: pain (15 points), activities of daily living (20 points), strength (25 points), and range of motion (40 points: forward elevation, external rotation, abduction, and internal rotation). The maximum score is 100 points; higher scores indicate better functional status. We classified treatment effectiveness based on the change in total score before and after treatment into four levels: Good, Fair, Average, and Poor. After 12 days of treatment, 48.5% of patients achieved a Good outcome, 45.5% Fair, and 6.0% Average; there were no Poor outcomes. Our results are comparable to several other studies: Nguyen Thi Nga (2006) reported Good + Fair outcomes of 90% for NSAIDs combined with rehabilitation therapy [8]. Le Thi Hoai Anh (2001) compared two treatment methods in 100 patients and found that EA combined with massage and therapeutic exercise yielded very good and good outcomes in 62% and fair in 32% (average 6%); the group treated with EA and massage alone had very good and good outcomes in 38%, fair in 48% and average in

14% [9]. Nghiem Thi Thu Thuy (2021) reported Good: 46.67%, Fair: 50%, Average: 3.33% [10].

During the 12-day treatment of 33 patients, no adverse events such as needle-related complications, bleeding, allergic rash, increased pain at exercise sites, or syncope were observed. This supports the safety of EA combined with therapeutic exercises for primary periarthritis of the shoulder.

These findings suggest that EA, when combined with therapeutic exercises, yields results comparable to those achieved with anti-inflammatory medications in conjunction with physical rehabilitation or EA, combined with massage and exercise. This combined approach is simple, economical, and available under insurance coverage at Hai Phong University Hospital and should be applied to achieve optimal outcomes in patients with primary shoulder periarthritis.

The research team recommends that, in addition to performing shoulder joint exercises during hospitalization, the Department of Traditional Medicine should organize structured therapeutic exercise instruction sessions for patients with shoulder periarthritis. Such sessions would facilitate patient adherence to continued practice at home and after discharge, thereby enhancing the sustainability of treatment outcomes and minimizing the risk of recurrence.

## CONCLUSION

In this study of 33 patients with primary periarthritis of the shoulder, EA combined with therapeutic exercises effectively reduced pain, increased shoulder ROM and muscle strength, and decreased joint effusion on ultrasound. The method is safe, easy to perform and cost-effective for patients with shoulder periarthritis.

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