



Review Article

Chinese Painology Expert Consensus on Acupotomy for the Treatment of Chronic Musculoskeletal Pain (2026 Edition)

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Abstract

Since the 1970s, acupotomy, a minimally-invasive therapeutic technique originating from China, has been widely adopted for managing chronic musculoskeletal pain and has yielded promising clinical outcomes in real-world practice. Despite its growing popularity, several critical challenges have emerged during its clinical implementation, including inappropriate selection of clinical indications, substandard technical performance, and inconsistent, heterogeneous treatment regimens across different practitioners and medical centres. Such practice-related limitations may contribute to unstable therapeutic effects, preventable treatment-related incidents, and avoidable peri-procedural complications, which consequently hinder the safe, standardised promotion and widespread popularisation of acupotomy therapy. To address these gaps and standardise the clinical application of acupotomy for chronic musculoskeletal pain, this expert consensus was initiated at the formal invitation of the Editorial Board of the Chinese Journal of Painology. A multidisciplinary panel of leading national specialists in pain medicine was convened to develop this document. The expert group systematically searched and appraised available evidence-based literature published both domestically and internationally, and integrated high-level research findings with extensive, long-term front-line clinical experience. After thorough discussion, the panel summarised core recommendations covering the fundamental principles, standard operating procedures, indications, contraindications and key safety precautions for acupotomy intervention in chronic musculoskeletal pain. Following multiple rounds of group discussion, peer review and iterative revision, the final version of this expert consensus was reached.

Keywords

Needle-knife, Acupotomy, Chronic Musculoskeletal Pain, Expert Consensus

1. Introduction

Acupotomy therapy originates from the acupuncture therapy of traditional Chinese medicine. In the 1970s, Zhu Hanzhang modified the tip of a traditional size 9 acupuncture needle into a flat blade, thereby playing the dual therapeutic role of acupuncture and micro-surgical cutting, creating acupotomy medicine. Acupotomy was originally indicated for musculoskeletal dyskinesia induced by post-traumatic scarring and adhesions. Its indications have been gradually broadened. With proven satisfactory efficacy against chronic musculoskeletal pain (CMP), Acupotomy has been widely used in clinical practice. However, improper indication criteria, non-standard operative skills, and varied treatment regimens result in inconsistent therapeutic effects. Adverse events and complications, such as postoperative local pain, hematoma, nerve injury, infection, syncope, etc., have been reported in a large number of clinical cases. These problems greatly impeding the

popularization of acupotomy.

This consensus statement aims to standardize the application of acupotomy therapy for CMP. We systematically retrieved literature from multiple databases, including the China National Knowledge Infrastructure (CNKI), Wanfang Data, the VIP Chinese Journal Database, PubMed, and MEDLINE, with the search period spanning from database establishment through June 2026. The Chinese search keywords were acupotomy/needle-knife and small needle-knife, together with CMP in the CNKI, VIP Database, and Wanfang Database. The English search keywords comprised acupotomy, acupotomology, needle knife, and CMP. We retrieved literature from authoritative medical databases including PubMed, Embase, Web of Science, and Cochrane Library. After screening eligible literature, we extracted high-quality evidence-based medical evidence. Combined with the clinical experience of all

participating consensus experts, we summarized and integrated the fundamental principles, standard operational procedures, indications, contraindications, and safety precautions for acupotomy in the management of CMP, and hereby formulates the present expert consensus.

The CMP addressed in this consensus is defined according to the International Classification of Diseases, 11th Revision (ICD-11) [1, 2], which is primarily divided into chronic primary musculoskeletal pain (CPMSP) and chronic secondary musculoskeletal pain (CSMSP). CPMSP refers to chronic primary pain occurring in muscles, bones, joints, or tendons, which is caused by a combination of biological, psychological and social factors, and cannot be directly attributed to a known disease or injury process. CPMSP can be anatomically classified into chronic primary neck pain, chronic primary chest pain, chronic primary low back pain and chronic primary limb pain. Patients may experience spontaneous or induced pain in the affected area, accompanied by hyperalgesia and/or allodynia. CSMSP refers to chronic pain originating from persistent nociceptive stimulation of bones (including spine and joints), muscles, tendons and related soft tissues caused by local or systemic etiologies, as well as deep somatic injury, and meets either of the following criteria: the presence of significant emotional distress (anxiety, anger, frustration, or depression) or functional impairment (limitation of daily activities, reduced social participation), and the pain cannot be attributed to any known underlying disease or injury process.

2. Concepts and Theoretical Foundations

2.1. Concept

Derived from the theoretical system of acupotomology, acupotomy therapy uses needle-knives as therapeutic instruments. Needle-knives are percutaneously inserted into lesions to produce dual curative effects including acupuncture stimulation and cutting release of soft tissues. With the gradual formation of a sound theoretical system, acupotomy has developed into a standardized academic discipline of acupotomology, which is widely utilized for chronic musculoskeletal pain and a range of internal diseases. Moreover, constant innovations have been made in acupotomology. Traditional needle-knife devices have been optimized combined with image visualization guidance, which markedly improves the clinical efficacy and safety of acupotomy.

2.2. Basic Principles and Fundamental Theories

Acupotomy therapy is developed based on the acupuncture theory of traditional Chinese medicine, combined with modern anatomy, physiology, pathology, and biomechanics of Western medicine. The needle-knife integrates the stimulating effects of acupuncture with the cutting, releasing, and peeling actions of a surgical blade [3]. After reaching the target point percutaneously, operations such as cutting, slicing, shaving,

and peeling are performed at the lesion target based on the linear structural anatomy of the human body. It plays a crucial role in releasing soft tissue adhesions, regulating mechanical balance, relieving fascia and muscle spasm, unblocking meridians, and reducing local pain-causing substances. For instance, maneuvers such as lifting-thrusting, shoveling-peeling, and penetrative peeling employ the cutting and slicing capabilities of the blade edge, whereas longitudinal dredging and transverse peeling employ the peeling functions of the blade edge and the anterior segment of the needle-knife shaft [4, 5].

Following percutaneous access to the target lesion site, a series of manipulations including cutting, incising, planing and dissection are performed in accordance with human linear structural anatomy. Such procedures exert key therapeutic effects on releasing soft tissue adhesions and restoring musculoskeletal mechanical balance. Specifically, lifting-thrusting, shovel-dissecting, and penetrating dissection maneuvers rely on the cutting and incising performance of the knife edge. In contrast, longitudinal loosening and transverse dissection leverage the dissecting capacity of both the blade edge and the anterior segment of the needle-knife shaft.

The basic theories of acupotomy include the closed surgery theory, the etiology and pathology theory of chronic soft tissue injury, and the pathological theory of osteoproliferation, and the meridian substance theory. The etiology and pathology theory of chronic soft tissue injury holds that soft tissues possess mechanical properties similar to those of osseous tissues, and the root cause of chronic soft tissue injury is the disruption of the body's dynamic balance. In the initial phase of soft tissue injury, the human body regulates imbalances via self-repair and compensation, which may subsequently result in soft tissue adhesions, contractures, and scar formation. If pathological changes involve the surrounding bone tissue, soft tissue calcification and ossification may occur to maintain the body's basic functions. Building upon these foundations, theories such as the spinal zone etiology theory, the human bowstring mechanical system theory [6], and mesh theory have been established. These theories elucidate the pathogenesis of human diseases from microcosmic and macrocosmic perspectives, respectively.

2.3. Operative Procedures and Manipulations

2.3.1. Operative Manipulations

Percutaneous minimally invasive soft tissue release is the core technique of acupotomy therapy, which can be categorized into sharp cutting release and blunt dissecting release. Standard acupotomy manipulations consist of longitudinal dredging, transverse dissection, incisional dissection, shovel-planing dissection, scar scraping, callus chiseling, penetrative dissection, and muscle fiber transection. Accumulated clinical experience has driven continuous innovation in acupotomy manipulations, giving rise to additional approaches, including longitudinal cutting, transverse swinging, hammering puncture, lifting-thrusting, scattered puncture, qi arrival release,

needle rotation, layered dissection, periosteal curettage, transverse pushing, cortical penetration, tension release, and scraping. These manipulations originate from conventional acupuncture manipulations and are guided by modern anatomical findings and biomechanical principles, meeting the scientific criteria for reproducibility and precision required in contemporary minimally invasive surgical procedures.

2.3.2. Standardized Four-Step Operative Procedure

Acupotomy therapy generally follows a standardized four-step procedure:

(i). Point Selection (Localization)

Mark the body surface after confirming the lesion site and anatomical structures. Sterilize the operative field, drape with a sterile hole towel, and perform local infiltration anesthesia.

(ii). Orientation

To avoid unintended injury, the orientation of the blade edge line should comply with the following principles based on clinical practice and anatomical norms. First, align parallel with the fiber direction of muscles and ligaments at the lesion site. Second, align parallel with the running direction of nerves and blood vessels at the operative site. When conflicts arise between the two principles, the running direction of nerves and blood vessels should generally dictate the direction of the blade edge line. For example, in the treatment of piriformis syndrome/sciatic nerve entrapment syndrome, release should be performed along the path of the sciatic nerve rather than along the muscle fibers that run almost perpendicular to the nerve.

(iii). Pressurized Separation

Pressurized separation is implemented prior to percutaneous penetration to shift major nerves and blood vessels away from the intended puncture track. Slightly increase the pressure on the needle tip during insertion to create a depression at the entry point (without puncturing the skin), sweep laterally once, and then push down the needle tip so that the blood vessels and nerves in the path are separated to both sides of the blade. When targeting regions adjacent to joints or bone surfaces, firm compression enables the operator to palpate the hard bone surfaces.

(iv). Skin Insertion

When sustained pressure applied to the needle shaft produces a firm, resistant tactile sensation at the needle tip, it indicates that the skin beneath the entry site has been pushed close to the bone. slight pressure will enable the needle-knife to penetrate the skin. At this point, the depression at the entry site basically disappears, and important tissues, including

nerves and blood vessels, bulge to both sides of the needle-knife shaft. Therapeutic release manipulations may then be implemented as required.

2.3.3. Basic Acupotomy Manipulations

The basic manipulations are performed in accordance with the Clinical Diagnosis, Treatment, and Operational Specifications of Acupotomy Medicine (2021) [7]:

(i). Longitudinal Cutting

Keep the blade edge line parallel to the long axis of the lesioned tissue fibers, key structures, or the spine, and perform vertical lifting-thrusting manipulations.

(ii). Transverse Cutting

Position the blade edge line perpendicular to the long axis of the lesioned tissue fibers, key structures, or the spine, and perform vertical lifting-thrusting manipulations.

(iii). Longitudinal Swinging

Swing the needle-knife body parallel to the long axis of the lesioned tissue fibers, key structure tissues, or the spine.

(iv). Transverse Swinging

Swing the needle-knife body perpendicularly to the long axis of the lesioned tissue fibers, key structural tissues or the spine.

(v). Cross-cutting

First perform longitudinal cutting, then rotate the cutting edge by 90 degrees and perform transverse cutting.

3. Indications and Contraindications

3.1. Indications and Evidence Recommendations

After more than 40 years of exploration and clinical practice, the indications of acupotomy therapy have expanded from degenerative motor system disorders to multiple clinical fields. However, most of the current indications are merely supported by clinical observations and personal experience, and have not been verified by rigorous randomized controlled trials. This consensus summarizes the clinical application of acupotomy therapy for CMP based on currently available high-quality literature, grading recommendations by the quality of evidence according to the GRADE system (Table 1 [8-74]).

Table 1. Evidence Quality and Recommendation Strength of Acupotomy for Chronic Musculoskeletal Pain.

Disorder Categories	Evidence Quality Grade	Recommendation Strength
1. Spinal-derived Pain		
(1) Cervicogenic headache [8, 9]	B	1
(2) Cervical spondylosis [10, 11]	A	1
(3) Lumbar disc herniation [12-17]	B	1
(4) Spinal stenosis [18-21]	B	2
(5) Vertebral compression fracture [22]	B	2
(6) Facet joint disorder syndrome [23]	A	1
(7) Ankylosing spondylitis [24, 25]	B	2
(8) Third lumbar transverse process syndrome [26, 27]	A	1
2. Osteoarthritis and Joint Pain		
(1) Joint Pain		
① Knee joint pain [28-37]	A	1
② Shoulder pain [38-43]	A	1
③ Hip joint pain (including femoral head necrosis)[44]	B	2
(2) Rheumatoid arthritis [45, 46]	C	3
(3) Gouty arthritis [47, 48]	B	2
(4) Sacroiliitis [49, 50]	B	2
3. Soft Tissue Lesions		
(1) Bursal lesions [51, 52]	A	1
(2) Myofascial trigger points [53-55]	A	1
(3) Tendinopathy / Enthesitis [57-59]	A	1
(4) Tenosynovitis [60-65]	A	1
4. Nerve Entrapment Pain		
(1) Nerve root entrapment [66-68]	B	1
(2) Piriformis syndrome [69, 70]	B	2
(3) Peripheral nerve entrapment [71, 72]	A	1
(4) Spinal nerve posterior branch syndrome [73, 74]	B	1

3.2 Contraindications

To standardize patient selection for acupotomy therapy, strict assessment of both systemic and local contraindications is required to prevent treatment-related complications.

3.2.1. Systemic Contraindications

Systemic contraindications include patients with active psychiatric disorders and individuals who cannot cooperate with

clinical treatment. The procedure is strictly contraindicated in patients with coagulation disorders such as hemophilia and severe thrombocytopenia. Patients with active systemic infection symptoms such as fever and leukocytosis, should be excluded. Acupotomy is prohibited during the acute phase of major organ diseases, including acute coronary heart disease, uncontrolled severe hypertension, and uncontrolled diabetes. Special populations, such as patients with poorly controlled hyperparathyroidism and patients with osteoporosis secondary to prolonged immobilization after fracture, are considered systemic contraindications. Other temporary biological states, including active

menstruation and pregnancy, are also contraindications for acupotomy treatment.

3.2.2. Local Contraindications

Local contraindications mainly involve active infection of the skin at the operational site, such as sinus tracts, active dermatitis, and folliculitis. Additionally, deep infections or abscesses presenting with erythema, swelling, warmth, pain, and functional impairment at the operative site are strictly contraindicated. Any site where critical structures, such as major blood vessels, vital organs, or major nerve trunks, cannot be safely avoided should be excluded to prevent complications, including hemorrhage, nerve laceration, pneumothorax, infection, and other severe injuries. Finally, acupotomy is strictly prohibited at sites of active osseous tuberculosis or local tumor lesions.

4. Precautions and Postoperative Nursing Care

Standardized precautionary measures and rigorous perioperative management are critical to achieving favorable clinical outcomes. Clinicians should accurately select indications and strictly observe contraindications. Prior to the procedure, patients should be fully informed of the procedural process, expected therapeutic effects, as well as potential complications and risks of this treatment, including possible treatment ineffectiveness, unanticipated adverse reactions, etc., followed by acquisition of written informed consent. Adequate preoperative communication and psychological care should be ensured. Nurses should assist doctors in comprehensively assessing the patients' physical and psychological status, and communicate effectively with the patients to alleviate anxiety and tension.

Strict aseptic techniques must be followed, including sanitation and sterilization of the operative environment thorough disinfection of the skin in the operative field, surgical hand scrubbing by operators before the procedure, strict sterilization of instruments, and immediately applying sterile dressings to the puncture site after the procedure. Clinicians must have an in-depth understanding of the anatomical characteristics of the acupotomy site, including the surface projections of

blood vessels and nerves, as well as superficial and deep landmarks, to avoid injuring large blood vessels, major nerve trunks, and visceral organs. Manipulation techniques must be precise, skillful, and gentle to prevent severe iatrogenic pain, which may lead to needle shock (vasovagal syncope) [14]. If a hematoma occurs, immediate ice compression, pressure-banding and close clinical observation should be performed. If vasovagal syncope occurs, immediate symptomatic rescue measures should be initiated. The adverse reactions are generally self-resolving within a short period.

To prevent needle breakage, instruments should be inspected prior pre-procedure checks (e.g., verifying the straightness of the shaft, stability of the handle, and absence of blade deformation). The use of disposable sterile acupotomy instruments is highly recommended. Gentle force should be applied during acupotomy manipulation and release dissection, and excessive force should be avoided. Postoperatively, nurses should assist doctors in instructing patients to rest appropriately and stay warm. The operational site should remain dry and untouched within 48 hours, and excessive local stretching or high-load activities should be avoided within 72 hours after treatment.

5. Innovations and Progress in Acupotomy

5.1. Instrumental Expansion of Acupotomy

The traditional acupotomy consists of a stainless steel shaft with a diameter of 0.5-1.0 mm, terminating in a flat blade edge 0.5-1.0 mm wide. Instruments with variable shaft lengths are employed to position the cutting tip at target tissues for therapeutic manipulation, with different lengths adapted to different treatment needs like soft tissue release, small bone spur shaving, etc. With the clinical promotion and application of acupotomy therapy, researchers have continuously modified and innovated traditional acupotomy techniques. In recent years, several novel acupotomy therapies and instruments have emerged, including radiofrequency acupotomy, plasma acupotomy, and laser acupotomy (Table 2 [10, 75-82]).

Table 2. Major Modern Acupotomy Instruments and Modalities.

Instrument / Modality	Structural Characteristics	Advantages	Disadvantages	Main Indications
Micro / Ultra-micro Acupotomy [75-77]	Small blade (approx. 0.5 mm), slender shaft.	It enables sufficient release of muscles, fascia, and other soft tissues. It features simple operation, superior safety, and higher patient acceptance.	Slender and soft shaft, weak transverse peeling capability.	Similar to traditional acupotomy.

Instrument / Modality	Structural Characteristics	Advantages	Disadvantages	Main Indications
Injection Acupotomy [10, 78]	Hollow canal in the center of the shaft, with a flat or concave blade edge.	It integrates two therapeutic approaches -release of closed adhesive scar tissue and drug injection, enabling acupotomy manipulation and drug administration to be performed simultaneously.	Hollow shaft, insufficient force during transverse release dissection.	Pathologies requiring anti-inflammatory and analgesic injections following target adhesiolysis, such as scapulo-humeral periarthritis, knee osteoarthritis, cervical disc herniation, lumbar disc herniation, etc.
Specially Shaped Acupotomy [79, 80]	Different shapes designed according to specific regional anatomical characteristics, such as sickle shape, curved hook shape, concave blade shape, etc.	It enables highly targeted intervention for specific diseases. For example, the sickle-shaped acupotomy has obvious advantages in treating stenosing tenosynovitis of hand flexor tendons.	While designed for specific diseases, acupotomy has limited general applicability.	Mainly suitable for stenosing tenosynovitis and peripheral nerve entrapment syndromes.
Acupotome Endoscope (Needle-knife Endoscope) [81, 82]	Dedicated acupotome endoscope equipment, including endoscopic imaging system, irrigation system, shaving and debridement systems, endoscopic surgical instruments, and meridian-sinew acupotomes, etc.	Operative procedures are performed under direct visualization inside the joint cavity or tissues via the endoscope. It simplifies procedures, minimizes wounds, offers a broad treatment range, and causes only minor adverse reactions.	Similar to arthroscopy, it requires specialized instruments and equipment.	Mainly suitable for scapulo-humeral periarthritis, knee osteoarthritis, ankle osteoarthritis, gouty tophi, and other diseases requiring intra-articular interventions.

5.2. Combined Therapies of Acupotomy

The clinical efficacy of acupotomy in treating CMP is widely recognized, and the combination of acupotomy with other therapeutic modalities can further improve clinical outcomes (Table 3) [66, 67, 83-91].

Table 3. Quality of Evidence and Recommendation Strength of Acupotomy Combined Therapies for CMP.

Combined Therapy Model	Evidence Quality Grade	Recommendation Strength
Acupotomy + Nerve Block [67, 83]	A	1
Acupotomy + Ozone Injection [84, 85]	B	2
Acupotomy + Biological Therapy (PRP / Stem Cells) [86-88]	B	2
Acupotomy + Acupuncture [66, 89]	B	2
Acupotomy + Physical Therapy [90, 91]	B	1

5.3. Clinical Operation Key Points of Common CMP

Disease categories, acupotomy treatment points, and operative procedures classified by different anatomical lesion sites are summarized in Table 4 [8-74].

Table 4. Clinical Operation Key Points of Acupotomy for Common CMP.

Disorder Categories	Treatment Points	Image Guidance	Operation Key Points
1. Spinal-derived Pain			

Disorder Categories	Treatment Points	Image Guidance	Operation Key Points
(1) Cervicogenic headache [8, 9]	Spinous processes, facet joints, and posterior tubercles of the transverse processes of the upper cervical vertebrae; tenderness points of the head and neck muscles, and their occipital attachments.	X-ray or ultrasound-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Advance the needle-knife to the osseous surface, perform 3 longitudinal peels, then 3 transverse swings. Withdraw the needle-knife once a loosening sensation is achieved.
(2) Cervical spondylosis [10, 11]	Paravertebral facet joints, joint capsules, and posterior tubercles of the transverse processes of the affected segments; tender sites of the scapular region or cervical palpable taut bands and positive nodules; ligamentum flavum, lateral recesses, nerve root exits, and the brachial plexus pathway.	X-ray, ultrasound, or CT-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Advance the needle-knife to the osseous surface, perform 3 longitudinal peels, then 3 transverse swings. Withdraw the needle-knife once a loosening sensation is achieved. For affected nerve roots, directly or indirectly, contact and stimulate the nerve root or ganglion to induce a neural stress response and elicit a protective avoidance reflex.
(3) Lumbar disc herniation [12-17]	Transverse processes, paravertebral facet joints, joint capsules, spinous processes, ligamentum flavum, and lateral recesses of the affected segments.	X-ray, ultrasound, or CT-guided.	The nerve stimulation targets for lumbar lesions are usually accessed and stimulated via the lateral recess or nerve root exit zone; other manipulations are consistent with those applied for cervical spondylosis.
(4) Spinal stenosis [18-21]	Facet joints, joint capsules, ligamentum flavum, and lateral recesses of the affected segments.	X-ray, ultrasound, or CT-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Advance the needle-knife to the osseous surface of the facet joints, lateral recesses, or ligamentum flavum; perform longitudinal peeling and transverse swinging, withdrawing upon a loosening sensation.
(5) Vertebral compression fracture [22]	Interspinous spaces above and below the fractured vertebra, facet joints, costotransverse joints, local soft tissue spaces, and local tenderness sites.	X-ray, ultrasound, or CT-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Advance the needle-knife to the surface of facet joints, interspinous spaces, or local tenderness points; perform longitudinal peeling and transverse swinging, withdrawing upon a loosening sensation.
(6) Facet joint disorder syndrome [23]	Perform on the facet joint capsules and surrounding soft tissues of the responsible segment.	X-ray, ultrasound, or CT-guided.	Shovel-cut the facet joint capsule and surrounding soft tissues of the responsible segments. Keep the blade aligned parallel to the longitudinal axis of the spine. Insert the needle-knife vertically to reach the osseous surface, then adjust the blade direction parallel to the joint facet plane. Execute 2–3 shoveling cuts to release the joint capsule and surrounding soft tissues, withdrawing upon a loosening sensation.
(7) Ankylosing spondylitis [24, 25]	Sacroiliac joint cavity, surrounding tendon attachments, and tenderness points.	X-ray, ultrasound, or CT-guided.	At the osseous surface and surrounding tenderness points of the joint, perform 2–3 longitudinal peels, followed by 2–3 transverse peels, withdrawing upon a loosening sensation.
(8) Third lumbar transverse process syndrome [26, 27]	Quadratus lumborum, intertransverse muscles, and fascia attached to the transverse process.	X-ray, ultrasound, or CT-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Rapidly insert the needle-knife to reach the osseous surface of the L3 transverse process tip. Closely along the anterior and posterior bone margins of the transverse process tip, perform 2–3 longitudinal peels and 2–3 transverse peels. Withdraw the needle-knife when a loosening sensation is felt or the patient reports soreness or distension.
2. Osteoarthritis and Joint Pain			

Disorder Categories	Treatment Points	Image Guidance	Operation Key Points
(1) Joint Pain	Treatment points are mainly identified by manual palpation of tender points, fibrous bands, indurated nodules, and high-tension areas, in combination with pathomorphological findings on X-ray and musculoskeletal ultrasound.	Ultra-sound-guided.	
① Knee joint pain [28-37]	The anserine bursa of the knee joint, medial and lateral patellar retinacula, quadriceps tendon, patellar ligament, suprapatellar bursa, as well as the tibial and fibular collateral ligaments.	Ultra-sound-guided.	
② Shoulder pain [38-43]	Coracoid process of the scapula, the greater and lesser tubercles of the humerus, the intertubercular groove, the subacromial bursa, and attachments of periarticular soft tissues in the quadrangular space exhibiting contracture, scar, and adhesion tenderness.	Ultra-sound-guided.	For affected ligament or tendon: Perform 2–3 longitudinal peels, followed by 2–3 transverse peels. Then rotate the blade line by 90° and conduct another 2–3 cross-peels (cross-cutting), withdrawing upon a loosening sensation. For affected joint cavity: Insert the needle body vertically through the skin to access the joint cavity directly. Perform 1–2 dredging manipulations, and withdraw upon a loosening sensation.
③ Hip joint pain (including femoral head necrosis) [44]	Femoral greater trochanter, gluteus medius, adductor group, iliotibial band, and tensor fasciae latae, groin, entrapment point of the superior cluneal nerve, hamstring origin, hip joint capsule release, and femoral head decompression drilling.	X-ray or ultra-sound-guided.	
(2) Rheumatoid arthritis [45, 46]	Joint cavity, surrounding ligaments, and tendon tenderness points of affected joints.	X-ray or ultra-sound-guided.	
(3) Gouty arthritis [47, 48]	Joint cavity, surrounding ligaments, and tendon tenderness points of affected joints. Note: Acupotome endoscope (needle-knife endoscope) offers superior efficacy over simple acupotomy.	Ultra-sound-guided.	
(4) Sacroiliitis [49, 50]	Sacroiliac joint cavity, surrounding ligaments, and tendon attachment tenderness points.	X-ray, ultrasound, or CT-guided.	At the osseous surface and surrounding areas, perform 2–3 longitudinal peels and 2–3 transverse peels, withdrawing upon a loosening sensation under the needle.
3. Soft Tissue Lesions			
(1) Bursal lesions [51, 52]	Suprapatellar bursa, anserine bursa, subacromial bursa, subcoracoid bursa, ischial bursa, etc.	Ultra-sound-guided.	Insert the needle along the course of muscle or tendon. When reaching the bursa and tendon site, perform 2–3 longitudinal dredgings and transverse peels.
(2) Myofascial trigger points [53-55]	Palpate the local taut band to locate localized painful indurated nodules at the center of the affected muscle belly, musculotendinous junctions, and at muscle-bone insertions.	Ultra-sound-guided.	Align the blade parallel to the myofascial direction. Insert the needle vertically through the skin at the tender point. Upon reaching the target, perform longitudinal cuts and swings, then tilt the shaft at 90° to the myofascial direction, execute 3 transverse peels, and withdraw upon a loosening sensation under the needle.

Disorder Categories	Treatment Points	Image Guidance	Operation Key Points
(3) Tendinopathy / Enthesitis [57-59]	Tender points at tendon insertions or calcified tendon lesions; Tender points characterized by positive pressure pain, palpable indurated masses, and fibrous bands or nodules.	Ultra-sound-guided.	At the osseous surface of the tender point, perform 2–3 longitudinal peels and 2–3 transverse peels, withdrawing upon a loosening sensation. For calcified lesions, target the calcification under ultrasound guidance, insert the needle-knife parallel to the tendon fibers to break up the calcium deposits, and withdraw the needle-knife after confirming the disappearance or dispersion of the hyperechoic mass under real-time ultrasound.
(4) Tenosynovitis [60-65]	Affected tendons, tendon sheaths, osteofibrous sheaths, and pulley sites.	Ultra-sound-guided.	Perform 2–3 longitudinal peels along the affected tendon, tendon sheath, osteofibrous canal, and pulley, withdrawing upon a loosening sensation.
4. Nerve Entrapment Pain			
(1) Nerve root entrapment [66-68]	Spinal spinous processes, trigger points between intertransverse regions; ligamentum flavum, intervertebral canal internal orifice ligaments, intervertebral canal external orifice surrounding ligaments, and soft tissues; affected vertebral facet joints.	X-ray, ultrasound, or CT-guided.	For the internal orifice of the nerve root via the interlaminar space: Advance the needle-knife tightly close to the bony surface of the medial margin of the facet joint to release the ligamentum flavum and the soft tissue at the internal ostium of the extradural intervertebral canal. For the external orifice of the intervertebral canal: Perform 2–3 cuts along the osseous margin at the upper-middle 1/3 of the affected external intervertebral orifice; pay close attention to patient-reported paresthesia.
(2) Piriformis syndrome [69, 70]	insertion and muscle belly indurations and fibrous bands located at the piriformis origin.	Ultra-sound-guided.	For Piriformis: Align parallel to the piriformis, perform local transverse cuts 3–5 times, and swing the needle shaft at the mid-to-lower portion of the muscle belly, withdrawing upon a loosening sensation. Adjust the position and direction of the needle-knife to gently contact and stimulate the sciatic nerve trunk and its sheath for 5–8 times, until radiation soreness, distension, pain, muscle twitching, numbness, or electric-shock sensation occurs in the lower limb. For origin, insertion, and tender points: Insert the needle vertically to the osseous surface, perform 3–5 longitudinal peels and transverse swings, and withdraw upon a loosening sensation.
(3) Peripheral nerve entrapment [71, 72]	Nerve entrapment points and tender points.	Ultra-sound-guided.	Keep the blade line parallel to the long axis of the nerve surrounding the entrapment point. Perform 3–5 longitudinal peels and transverse swings, withdrawing upon a loosening sensation.
(4) Spinal nerve posterior branch syndrome [73, 74]	The intersection of the transverse process root and the facet joint along the path of the affected posterior nerve branch.	X-ray, ultrasound, or CT-guided.	Keep the blade aligned parallel to the longitudinal axis of the spine. Slowly advance the needle to the transverse process root and the bone surface of the facet joint. Perform 3–4 shoveling cuts close to the bone surface, withdrawing the needle-knife when a loosening sensation is felt or the patient reports soreness or distension.

6. Summary of Clinical Challenges and Trends

In conclusion, acupotomy medicine remains in the developing stage, and its clinical efficacy varies significantly with clinicians' different diagnostic and operational skills. At present, most acupotomy localization and targeting procedures are still performed blindly, which poses potential safety risks during releasing deep soft tissues. Although visualized acupotomy assisted by imaging techniques (represented by high-frequency musculoskeletal ultrasound) represents the prevailing

and future developmental trend of acupotomy medicine, the standardization of relevant operational procedures requires further optimization and improvement.

7. GRADE Quality of Evidence and Recommendation Strength Standard

The consensus is graded using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system, ensuring objective evidence translation (Table 5) [92-94].

Table 5. GRADE Quality of Evidence and Recommendation Strength Standards.

Level / Strength	Classification	Operational Definition and Description
Quality of Evidence		
High Quality (A)	High confidence	Highly confident that the estimated clinical effect is close to the true therapeutic effect.
Moderate Quality (B)	Moderate confidence	Moderately confident in the estimated effect: the estimate is likely close to the true value, but there is a possibility that it is substantially different.
Low Quality (C)	Low confidence	Limited confidence in the estimated effect: the clinical estimate may be substantially different from the true therapeutic value.
Very Low Quality (D)	Very low confidence	Little to no confidence in the estimated effect: the clinical estimate is highly likely to differ substantially from the true value.
Strength of Recommendation		
Strong Recommendation (1)	Strong recommendation	Most patients would select the recommended strategy under this scenario, with only a small minority declining; most clinicians should adopt this intervention, supported by over 70% of the consensus expert panel.
Weak Recommendation (2)	Weak recommendation	Most patients would choose the recommended strategy, but many would not; clinicians should actively search for evidence summaries to prepare for collaborative discussions reflecting patient values and preferences; supported by 50%–70% of the consensus expert panel.
No Clear Recommendation (3)	Neutral recommendation	Benefits and harms are closely balanced; the target population is not clearly defined; evidence is insufficient to formulate a recommendation; supported by less than 50% of the consensus expert panel.

Abbreviations

CMP	Chronic Musculoskeletal Pain
CNKI	China National Knowledge Infrastructure
ICD-11	International Classification of Diseases, 11th Revision
CPMSP	Chronic Primary Musculoskeletal Pain
CSMSP	Chronic Secondary Musculoskeletal Pain
GRADE	Grading of Recommendations Assessment, Development, and Evaluation

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Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] El-Tallawy SN, Nalamasu R, Salem GI, Christo PJ. Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain Ther.* 2021; 10(1): 181-209. <https://doi.org/10.1007/s40122-021-00235-2>
- [2] Raja SN, Carr DB, Cohen M, Vader K. The revised International Association for the Study of Pain definition of pain: concepts, challenges, and compromises. *PAIN.* 2020; 161(9): 1976-1982. <https://doi.org/10.1097/j.pain.0000000000001939>
- [3] Zhu HZ, Liu BZ. *Acupotomy Clinical Diagnosis and Treatment*. 2nd ed. Beijing, People's Medical Publishing House; 2009, 23-301.
- [4] Pang JG. *Foundations and Clinical Practice of Acupotomy Medicine - Bone and Joint Diseases*. 2019: 892.
- [5] Zhu HZ. *Principles of Acupotomy Medicine*. Beijing, People's Medical Publishing House; 2002, 1-56.
- [6] Zhang TM, Liu JM, Wang RL. Expert lecture series VI: Etiological and pathological theory of chronic visceral diseases. *China Medical Herald*, 2017, 14(21): 151-154.
- [7] Wu XP, Peng L, Zhou P, editors. *Clinical Diagnosis, Treatment and Operational Standards of Acupotomy Medicine*. 2021. p. 315.
- [8] Wang LX, Ma JY, Zhu LX, et al. Effectiveness and safety of ultrasound-guided C2-3 facet joint block combined with acupotomy release at posterior atlantoaxial joint for cervicogenic headache. *Imaging Research and Medical Application*, 2019, 3(18): 126-127.
- [9] Wang KP, Fan KY, Zhou XH, et al. Clinical observation of acupotomy combined with warm needle acupuncture for cervicogenic headache based on meridian-sinew theory. *Journal of Guangxi University of Chinese Medicine*, 2024, 27(5): 16-19.
- [10] Pu J, Cao W, Chen Y, et al. Ultrasound-guided injection acupotomy as a minimally invasive intervention therapy for cervical spondylotic radiculopathy: a randomized control trial. *Ann Med*, 2023, 55(1): 2233556. <https://doi.org/10.1080/07853890.2023.2233556>
- [11] Liu F, Zhou F, Zhao M, et al. Acupotomy therapy for chronic nonspecific neck pain: a systematic review and meta-analysis. *Evid Based Complement Alternat Med*, 2017, 2017: 6197308. <https://doi.org/10.1155/2017/6197308>
- [12] Song X, Zhang CR, Zuo XT, et al. Different acupotomy insertion points for lumbar disc herniation: a randomized controlled study. *Zhongguo Zhen Jiu*, 2022, 42(1): 35-40. <https://doi.org/10.13703/j.0255-2930.20201204-k0004>
- [13] Kim HJ, Jeon JH, Kim YI, et al. Clinical effect of acupotomy combined with Korean medicine: a case series of a herniated intervertebral disc. *J Acupunct Meridian Stud*, 2016, 9(1): 31-41. <https://doi.org/10.1016/j.jams.2015.09.001>
- [14] Jiang L, Zhang B, Yu H, et al. Analysis on adverse event in acupotomy therapy based on literature research. *Zhongguo Zhen Jiu*, 2018, 38(9): 1007-1012. <https://doi.org/10.13703/j.0255-2930.2018.09.027>
- [15] Lee J, Lee S, Suh H, et al. Effectiveness of acupotomy combined with epidural steroid injection for lumbosacral radiculopathy: a randomized controlled pragmatic pilot study. *Medicina (Kaunas)*, 2024, 60(1): 175. <https://doi.org/10.3390/medicina60010175>
- [16] Sun XC, Zhang SM, Liu SJ. Acupotomy Combined with Celecoxib and Zhenggu Shenjin Capsules for Lumbar Disc Herniation: a propensity score-matched retrospective cohort study. *J Pain Res*, 2026, 19: 594368. <https://doi.org/10.2147/jpr.s594368>
- [17] Liang Y, Chen L, Cui Y, et al. Ultrasound-guided acupotomy for trigger finger: a systematic review and meta-analysis. *J Orthop Surg Res*, 2023, 18(1): 678. <https://doi.org/10.1186/s13018-023-04127-3>
- [18] Kwon CY, Yoon SH, Lee B, et al. Acupotomy for the treatment of lumbar spinal stenosis: a protocol for a systematic review and meta-analysis. *Medicine*, 2019, 98(3): e14160. <https://doi.org/10.1097/md.00000000000014160>
- [19] Lee JH, Lee HJ, Woo SH, et al. Effectiveness and safety of acupotomy on lumbar spinal stenosis: a pragmatic, pilot, randomized controlled trial. *J Pain Res*, 2023, 16: 659-668. <https://doi.org/10.2147/jpr.s399132>
- [20] Kim, JH, Han, CH, Lee, T al. Effectiveness and safety of combining pharmacopuncture therapy and acupotomy for treating patients with degenerative lumbar spinal stenosis: A pragmatic, assessor-blinded, randomized, controlled trial. *Integr Med Res*. 2026, 15(1): 101204. <https://doi.org/10.1016/j.imr.2025.101204>

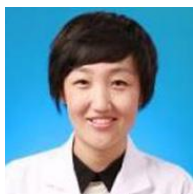
- [21] Chen Y, Song H, Chen M, et al. The role of acupotomy in treatment of patients with lumbar spinal stenosis: a protocol for a randomized study. *Medicine*, 2020, 99(31): e21444. <https://doi.org/10.1097/md.00000000000021444>
- [22] Wang ZG, He ZL, Peng SY. Clinical efficacy of ultrasound-guided ultra-micro needle knife combined with PVP in elderly patients with OVCF: a retrospective study. *Am J Transl Res*. 2025, 17(12): 9905-9915. <https://doi.org/10.62347/dnsp4048>
- [23] Lu D, Xu WX, Ding WG, et al. Case-control study on needle-knife to cut off the medial branch of the lumbar posterior ramus under C-arm guiding for the treatment of low back pain caused by lumbar facet osteoarthritis. *Chin J Orthop Trauma*, 2013, 26(3): 221-225.
- [24] Gao YQ, Zhu H, Zhang H, et al. Needle knife diagnosis and treatment for ankylosing spondylitis at middle and advanced stage based on the theory of meridian tendons. *Zhongguo Zhen Jiu*, 2025, 45(4): 387-391. <https://doi.org/10.13703/j.0255-2930.20240317-0001>
- [25] You Y, Cai M, Lin J, et al. Efficacy of needle-knife combined with etanercept treatment regarding disease activity and hip joint function in ankylosing spondylitis patients with hip joint involvement: a randomized controlled study. *Medicine*, 2020, 99(19): e20019. <https://doi.org/10.1097/md.00000000000020019>
- [26] Wang YZ, Dong FH, Zhong HG, et al. Randomized control clinical study on third lumbar transverse process syndrome treated by knife needle. *Zhongguo Gu Shang*, 2009, 22(6): 438-441. <https://doi.org/10.3969/j.issn.1003-0034.2009.06.012>
- [27] Guo C, Dong F, Li S, et al. Effects of acupotomy lysis on local soft tissue tension in patients with the third lumbar vertebrae transverse process syndrome. *Zhongguo Zhen Jiu*, 2012, 32(7): 617-620.
- [28] Acupotomy Medicine Branch of Chinese Association of Chinese Medicine, Xiu ZB, Chen CX, et al. Clinical diagnosis and treatment guideline for acupotomy in knee osteoarthritis. *Journal of Rehabilitation*, 2023, 33(3): 193-201.
- [29] Lee C, Luo W, Tam K, et al. Comparison of the effects of acupotomy and acupuncture on knee osteoarthritis: a systematic review and meta-analysis. *Complement Ther Clin Pract*, 2023, 50: 101712. <https://doi.org/10.1016/j.ctcp.2022.101712>
- [30] Fang T, Li Q, Zhou F, et al. Effect and safety of acupotomy in treatment of knee osteoarthritis: a systematic review and meta-analysis. *J Tradit Chin Med*, 2020, 40(3): 355-364. <https://doi.org/10.19852/j.cnki.jtcm.2020.03.002>
- [31] Wu Q, Wu Z, Lu Z. Efficacy of acupotomy combined with sodium hyaluronate versus sodium hyaluronate alone in the treatment of knee osteoarthritis: a meta-analysis. *Medicine*, 2023, 102(37): e34930. <https://doi.org/10.37766/inplasy2023.5.0029>
- [32] Sun J, Zhao Y, Zhu R, et al. Acupotomy therapy for knee osteoarthritis pain: systematic review and meta-analysis. *Evid Based Complement Alternat Med*, 2020, 2020: 2168283. <https://doi.org/10.1155/2020/2168283>
- [33] Qu B, Wu X, Liu H, et al. Meta-analysis and systematic review of acupotomy combined with puncture and moxibustion in the treatment of knee osteoarthritis. *Ann Palliat Med*, 2021, 10(6): 6637-6649. <https://doi.org/10.21037/apm-21-1083>
- [34] Zhu J, Zheng Z, Liu Y, et al. The effects of small-needle-knife therapy on pain and mobility from knee osteoarthritis: a pilot randomized-controlled study. *Clin Rehabil*, 2020, 34(12): 1497-1505. <https://doi.org/10.1177/0269215520938852>
- [35] Liu MR, Li L, He ZW. Therapeutic effect of ultrafine acupotomy at anti-Ashi points for knee osteoarthritis. *Zhongguo Zhen Jiu*, 2012, 32(7): 621-624.
- [36] Ding Y, Wang Y, Shi X, et al. Effect of ultrasound-guided acupotomy vs electro-acupuncture on knee osteoarthritis: a randomized controlled study. *J Tradit Chin Med*, 2016, 36(4): 450-455. [https://doi.org/10.1016/s0254-6272\(16\)30060-7](https://doi.org/10.1016/s0254-6272(16)30060-7)
- [37] Lin S, Lai C, Wang J, et al. Efficacy of ultrasound-guided acupotomy for knee osteoarthritis: a systematic review and meta-analysis of randomized controlled trials. *Medicine*, 2023, 102(2): e32663. <https://doi.org/10.1097/md.00000000000032663>
- [38] Zhai PF, Zhao YG. Clinical efficacy of acupotomy combined with release manipulation for periarthritis of shoulder. *Clinical Research and Practice*, 2022, 7(22): 133-135. <https://doi.org/10.19347/j.cnki.2096-1413.202222036>
- [39] Wan Q, Wang L, Yang LF, et al. Clinical effect of ultrasound-guided hydro-acupotomy release of coracohumeral ligament for frozen shoulder in elderly patients. *Chinese Journal of Gerontology*, 2022, 42(18): 4462-4465. <https://doi.org/10.3969/j.issn.1005-9202.2022.18.021>
- [40] Chae H, Chu H, Lee J, et al. Effectiveness and safety of acupotomy treatment on shoulder pain: 25 multicenter retrospective study. *J Pain Res*, 2023, 16: 1367-1380. <https://doi.org/10.2147/jpr.s398711>
- [41] You J, Yang F, Liu N, et al. Acupotomy therapy for shoulder adhesive capsulitis: a systematic review and meta-analysis of randomized controlled trials. *Evid Based Complement Alternat Med*, 2019, 2019: 2010816. <https://doi.org/10.1155/2019/2010816>
- [42] Xu H, Zhang Y, Wang C, et al. Ultrasound-guided hydrodilatation of glenohumeral joint combined with acupotomy for treatment of frozen shoulder. *J Back Musculoskelet Rehabil*, 2022, 35(5): 1153-1160. <https://doi.org/10.3233/bmr-210272>
- [43] Guo S, Liu D, Yang Y, et al. Clinical efficacy of small needle knife therapy on stage I-II frozen shoulder. *J Vis Exp*, 2023, (201): e65904. <https://doi.org/10.3791/65904>
- [44] Wang Z, Zhou X, Xie L, et al. Acupotomy and acupuncture in the treatment of avascular necrosis of femoral head at the early and middle stages: a clinical randomized controlled trial. *Zhongguo Zhen Jiu*, 2016, 36(10): 1031-1035. <https://doi.org/10.13703/j.0255-2930.2016.10.007>

- [45] Ning YF, Tian XM, Lei HT. Related mechanisms and clinical research progress of acupotomy for rheumatoid arthritis. *Clinical Journal of Chinese Medicine*, 2023, 35(11): 2256-2260. <https://doi.org/10.16448/j.cjctcm.2023.1142>
- [46] Wang JY, Yan Y, Xia CM, et al. Efficacy analysis of manual release combined with acupotomy release for hip joint dysfunction caused by rheumatoid arthritis. *Chinese Journal of Bone and Joint Injury*, 2022, 37(10): 1055-1058. <https://doi.org/10.7531/j.issn.1672-9935.2022.10.012>
- [47] Gao YQ, Tian XM, Wang HD, et al. Discussion on acupotomy for refractory gout based on meridian-sinew theory. *Rheumatism and Arthritis*, 2023, 12(12): 47-50, 61. <https://doi.org/10.3969/j.issn.2095-4174.2023.12.012>
- [48] Zhang GH, Wang JJ, Yang L, et al. Efficacy of Qingre Tongbi decoction combined with minimally invasive acupotomy arthroscopy for knee gouty arthritis and its effects on serum cyclooxygenase-2 and nitric oxide. *Hebei Journal of Traditional Chinese Medicine*, 2023, 45(11): 1837-1840. <https://doi.org/10.3969/j.issn.1002-2619.2023.11.017>
- [49] Liu LG, Tian MN, Kui Y. Clinical observation of small needle-knife therapy combined with manipulation for postpartum sacroiliac joint subluxation. *Journal of Guangzhou University of Chinese Medicine*, 2023, 40(7): 1712-1717. <https://doi.org/10.13359/j.cnki.gzxbtcm.2023.07.020>
- [50] Hou XJ, Zhou ZY, Li WL, et al. Clinical efficacy of J-type acupotomy combined with sinomenine for sacroiliitis. *Practical Clinical Journal of Integrated Traditional Chinese and Western Medicine*, 2024, 24(11): 6-9, 23.
- [51] Cheng HJ, Liao LH, Chen SJ, et al. Efficacy of high-frequency ultrasound-guided small needle-knife combined with drug injection for subacromial bursitis. *Chinese Journal of Physical Medicine and Rehabilitation*, 2016, 38(8): 591-593. <https://doi.org/10.3760/cma.j.issn.0254-1424.2016.08.008>
- [52] Zhu T, Xiao LZ, Jiang W, et al. Ultrasound-guided drug injection combined with acupotomy for pes anserine bursitis. *Chinese Journal of Pain Medicine*, 2018, 24(8): 615-618. <https://doi.org/10.3969/j.issn.1006-9852.2018.08.011>
- [53] Wang ZQ, Li Y. Research progress of traditional Chinese medicine on trigger points for myofascial pain syndrome. *J Emerg Tradit Chin Med*, 2020, 29(12): 2245-2249. <https://doi.org/10.3969/j.issn.1004-745X.2020.12.052>
- [54] Tang ZY, Zhang HK, Wu Mq, Zhang Sd. Ultrasound-guided acupotomy release in the treatment of refractory low back pain: A case report. *Medicine*. 2025, 104(42): e45046. <https://doi.org/10.1097/md.00000000000045046>
- [55] Yu XJ, Chen XY, Zhu ZL, et al. Clinical therapeutic effects of trigger point acupuncture for chronic lumbar myofascial pain syndrome. *Chinese Journal of Pain Medicine*, 2017, 23(3): 194-199. <https://doi.org/10.3969/j.issn.1006-9852.2017.03.007>
- [56] Liu LQ, Wang AC. Ultrasound-guided suprascapular nerve block combined with acupotomy for calcific tendinitis of rotator cuff: a report of 42 cases. *Chinese Journal of Traditional Medical Traumatology & Orthopedics*, 2020, 28(7): 50-52, 56.
- [57] Ge L, Liu X, Zhang R, et al. Comparison between acupotomy and corticosteroid injection for patients diagnosed with different classifications of tennis elbow: a randomized control trial. *J Orthop Surg Res*, 2022, 17(1): 433. <https://doi.org/10.1186/s13018-022-03323-x>
- [58] Xu L, Luo YX, Zhou CJ, et al. A standardized acupotomy protocol for the treatment of tenosynovitis of hand flexor tendons in human patients. *J Vis Exp*, 2026, 231. <https://doi.org/10.3791/70416>
- [59] Feng C, Yao J, Xie Y, et al. Small needle-knife versus extracorporeal shock wave therapy for the treatment of plantar fasciitis: a systematic review and meta-analysis. *Heliyon*, 2024, 10(1): e24229. <https://doi.org/10.1016/j.heliyon.2024.e24229>
- [60] Zhu T, Jiang W, Wang K, et al. Ultrasound-guided drug injection combined with acupotomy for stenosing tenosynovitis of radial styloid process. *Chinese Journal of Interventional Imaging and Therapy*, 2018, 15(8): 465-468. <https://doi.org/10.13929/j.1672-8475.201801021>
- [61] Jiang L, Liu H, Li H, et al. Ultrasound-guided needle-knife for De Quervain's disease: a protocol for systematic review and meta-analysis. *Medicine*, 2021, 100(14): e24877. <https://doi.org/10.37766/inplasy2021.1.0094>
- [62] Pan M, Sheng S, Fan Z, et al. Ultrasound-guided percutaneous release of A1 pulley by using a needle knife: a prospective study of 41 cases. *Front Pharmacol*, 2019, 10: 267. <https://doi.org/10.3389/fphar.2019.00267>
- [63] Li D, Wang X, Fang T, et al. Acupotomy in the treatment of tenosynovitis of hand flexor tendons: a systematic review and meta-analysis. *Medicine*, 2022, 101(45): e31504. <https://doi.org/10.1097/md.00000000000031504>
- [64] Zhang WB, Yao DW, Wu WX. Efficacy of ultrasound-guided small needle-knife for stenosing tenosynovitis of flexor tendons. *Zhongguo Zhen Jiu*, 2019, 39(8): 867-870. <https://doi.org/10.13703/j.0255-2930.2019.08.017>
- [65] Lan X, Xiao L, Chen B, et al. A comparison of the outcomes of open trigger release versus ultrasound-guided modified small needle-knife percutaneous release for treatment of trigger digits. *J Hand Surg Asian Pac Vol*, 2023, 28(1): 69-74. <https://doi.org/10.1142/s2424835523500017>
- [66] Li AL, Wang XW, Wang JR, et al. Clinical observation of acupotomy combined with warm needle acupuncture for cervical spondylotic radiculopathy with qi stagnation and blood stasis syndrome. *Zhen Ci Yan Jiu*, 2022, 47(10): 914-917, 926. <https://doi.org/10.13702/j.1000-0607.20210968>
- [67] Wang BJ, Gao CY, Jin ZF, et al. Ultrasound-guided acupotomy combined with transforaminal nerve root block for lumbar disc herniation: a report of 40 cases. *Zhongguo Zhen Jiu*, 2020, 40(12): 1297-1298. <https://doi.org/10.13703/j.0255-2930.20191127-0001>
- [68] Wang ZB, He H, Luo ZC, et al. Efficacy of acupotomy combined with Mulligan maneuver for cervical spondylotic radiculopathy. *The Journal of Cervicodynia and Lumbodynia*, 2023, 44(1): 126-127. <https://doi.org/10.3969/j.issn.1005-7234.2023.01.038>

- [69] Song SF, Wang XY, Su JG. Effect of ultrasound-guided acupotomy nerve stimulation combined with sinomenine injection for piriformis syndrome. *Henan Medical Research*, 2024, 33(10): 1790-1793.
<https://doi.org/10.3969/j.issn.1004-437X.2024.10.016>
- [70] Miao TT, Ping JJ, Yang J, et al. Acupoint injection combined with small needle-knife for piriformis syndrome. *Jilin Journal of Traditional Chinese Medicine*, 2024, 44(3): 351-355.
<https://doi.org/10.13463/j.cnki.jlzyy.2024.03.025>
- [71] Ni CF. Clinical observation of ultrafine acupotomy for superior cluneal nerve entrapment syndrome. *Chinese Journal of Acupuncture and Moxibustion (Electronic Edition)*, 2018, 7(2): 45-48.
<https://doi.org/10.3877/cma.j.issn.2095-3240.2018.02.001>
- [72] Zhou Q, Shen Y, Jia Y, et al. Clinical anatomical study on the treatment of carpal tunnel syndrome with classic acupotomy. *Zhongguo Gu Shang*, 2020, 33(8): 745-749.
<https://doi.org/10.12200/j.issn.1003-0034.2020.08.012>
- [73] Song JC, Ye ML. Clinical observation of DSA-guided acupotomy for lumbar dorsal ramus syndrome. *Guangming J Chin Med*, 2021, 36(14): 2401-2403.
<https://doi.org/10.3969/j.issn.1003-8914.2021.14.045>
- [74] Xu YZ, Su M, Feng PJ, et al. Application of ultrasound-guided selective nerve branch block in lumbar dorsal ramus syndrome. *Zhongguo Gu Shang*, 2021, 34(4): 341-346.
<https://doi.org/10.12200/j.issn.1003-0034.2021.04.009>
- [75] Bai HX, Ma DP, Pan XF. Review on improvement and development of small needle-knife instruments. *Xinjiang Journal of Traditional Chinese Medicine*, 2022, 40(4): 132-134.
- [76] Luo JC, Wang LD, Xu WB, et al. Micro-acupotomy for cervical vertigo and its effect on vertebral artery hemodynamics. *Zhongguo Zhen Jiu*, 2022, 42(8): 844-848.
<https://doi.org/10.13703/j.0255-2930.20211015-0001>
- [77] Wang LZ, Guo ZP, Wang SZ, et al. Research progress on clinical application of ultrafine acupotomy therapy. *Journal of Hebei North University (Natural Science Edition)*, 2021, 37(10): 60-63.
<https://doi.org/10.3969/j.issn.1673-1492.2021.10.017>
- [78] Yan ZJ, Sun HL, Zhao LF, et al. Comparison of efficacy among hydro-acupotomy, small needle-knife, and intra-articular sodium hyaluronate injection for knee osteoarthritis. *The Journal of Practical Medicine*, 2023, 39(5): 591-596.
<https://doi.org/10.3969/j.issn.1006-5725.2023.05.011>
- [79] Jin JM, Zhang NJ, Wang JZ, et al. Efficacy of ultrasound-guided hook-knife for adult trigger finger. *Chin Mod Dr*, 2022, 60(17): 55-57, 72.
- [80] Li RQ, Zhang GP, Li YJ, et al. Comparative study of minimally invasive treatment with self-made sickle-shaped small needle-knife versus open surgery for stenosing tenosynovitis of flexor tendons. *Chin Gen Pract*, 2013, 16(36): 3611-3613.
<https://doi.org/10.3969/j.issn.1007-9572.2013.28.101>
- [81] Ding XJ, Cheng MZ, Zhang YJ, et al. Research progress on clinical application of minimally invasive acupotomy arthroscopy for joint diseases. *Rheumatism and Arthritis*, 2023, 12(4): 67-70.
<https://doi.org/10.3969/j.issn.2095-4174.2023.04.016>
- [82] Ge C, Zhang Y, Cheng SD, et al. Medium and long-term efficacy of acupotomy arthroscopy combined with manual release for severe frozen shoulder and its effects on serum inflammatory factors. *Chinese Journal of Traditional Medical Traumatology and Orthopedics*, 2023, 31(2): 35-39, 43.
- [83] Rao Y, Hou F, Huang H, et al. The combined treatment of entrapped infrapatellar branch of the saphenous nerve after ACL reconstruction: ultrasound-guided perineural injection and acupotomy. *J Back Musculoskelet Rehabil*, 2022, 35(3): 479-483.
<https://doi.org/10.3233/bmr-210110>
- [84] Chen FY, Zhou X, Wu BQ. Clinical efficacy of radiofrequency acupotomy combined with ozone injection for knee osteoarthritis. *The Journal of Practical Medicine*, 2022, 38(3): 335-339.
<https://doi.org/10.3969/j.issn.1006-5725.2022.03.014>
- [85] Mu HZ, Zhang QJ, Dong ZB, et al. Comparison of two imaging-guided plasma needle-knife combined with ozone for lumbar disc herniation. *Orthopedic Journal of China*, 2021, 29(13): 1226-1228.
- [86] An X, Wang T, Zhang W, et al. Chondroprotective effects of combination therapy of acupotomy and human adipose mesenchymal stem cells in knee osteoarthritis rabbits via the GSK3beta-Cyclin D1-CDK4/CDK6 signaling pathway. *Aging Dis*, 2020, 11(5): 1116-1132.
<https://doi.org/10.14336/ad.2019.1104>
- [87] Ji GF, Chen WX. Clinical application of ultrasound-guided acupotomy combined with platelet-rich plasma in the treatment of carpal tunnel syndrome. *Front Surg*, 2025, 12: 1629781.
<https://doi.org/10.3389/fsurg.2025.1629781>
- [88] Wang Y, Yang A, Dai S. Efficacy evaluation of acupotomy combined with platelet-rich plasma in the treatment of early and middle osteoarthritis. *Am J Clin Exp Immunol*, 2021, 10(2): 48-55.
- [89] Wu J, Huang YJ, Xiong P, et al. Effect of small needle-knife combined with acupuncture, massage, and traction for cervical spondylotic radiculopathy. *Chin. Mod. Med.*, 2024, 31(24): 27-30, 34. <https://doi.org/10.3969/j.issn.1674-4721.2024.24.008>
- [90] Fang WF. Clinical observation of small needle-knife closed release combined with Chinese herbal fumigation for ankylosing spondylitis. *J. Pract. Tradit. Chin. Med.*, 2023, 39(1): 119-121.
- [91] Koonen L, Van A, Smulders K, et al. Added value of ultrasound-guided percutaneous needle tenotomy over hydrodissection and physiotherapy in chronic lateral elbow tendinopathy: a pilot randomized controlled trial. *J Ultrason*, 2023, 23(95): e358-e364.
<https://doi.org/10.15557/jou.2023.0040>
- [92] Balshem H, Helfand M, Schunemann H, et al. GRADE guidelines: 3. Rating the quality of evidence. *J Clin Epidemiol*, 2011, 64(4): 401-406.
<https://doi.org/10.1016/j.jclinepi.2010.07.015>

- [93] Guyatt G, Oxman A, Akl E, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. *J Clin Epidemiol*, 2011, 64(4): 383-394.
<https://doi.org/10.1016/j.jclinepi.2010.04.026>
- [94] Jaeschke R, Guyatt G, Dellinger P, et al. Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive. *BMJ*, 2008, 337: a744.
<https://doi.org/10.1136/bmj.a744>

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