CHAPTER

7

Myofascial trigger points

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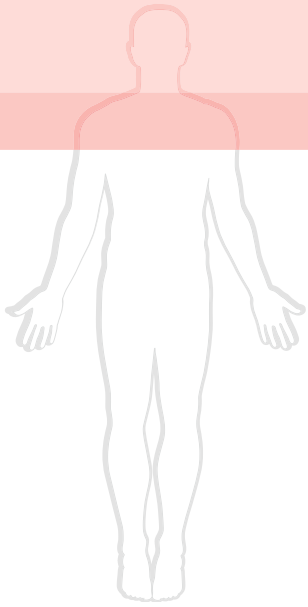

After reading this chapter you should be able to:

- describe the essential features of myofascial trigger points
- list four major diagnostic criteria
- describe the pain referral pattern of two myofascial trigger points.

Introduction

The one type of acupuncture treatment that we have not yet discussed involves the practitioner examining a muscle to find its most tender point and needling that point precisely. He or she then stimulates the needle, and may withdraw it straightaway. Sometimes, the patient experiences immediate relief of pain. We believe that acupuncture is most rapidly effective for a particular type of tender point called a *myofascial trigger point* (MTrP). It is not unreasonable to speculate that acupuncture may have been developed originally as a treatment for these MTrPs.

Muscles form the largest organ in the body. They usually recover rapidly from injury, but occasionally they develop a tender and hyperirritable spot,

the MTrP. This causes persistent pain, which has certain characteristics that can help distinguish it from other painful conditions. This chapter discusses all aspects of the MTrP, and is the final chapter on the mechanisms of Western medical acupuncture.

The two authors who have made the greatest contribution to the understanding of trigger points are Travell and Simons, physicians from rheumatology and pain-management backgrounds in conventional medicine (Simons et al 1999, Travell & Simons 1983, Travell & Simons 1992). Their rigorous approach to the diagnosis, mechanisms and treatment of MTrPs established them as a clinical condition and separated them from a confusing rag-bag of doubtful or non-committal diagnoses in soft-tissue pain disorders, such as fibrositis, myalgia and muscular rheumatism.

Many conventional healthcare practitioners are unfamiliar with the MTrP and have difficulty accepting it as a condition. Even physicians specializing in orthopaedics or rheumatology often dismiss MTrP pain, either because the condition is not common in the type of patient they see, or because they regard the whole subject of soft-tissue pain as a 'grey area' consisting of borderline diagnoses linked to psychological problems and dismiss it all as 'functional'.

There is now considerable accumulated clinical experience in treating the MTrP, and the evidence in support of the MTrP as a genuine clinical entity is marked by the following milestones:

- Pain arising from muscles is referred. In an extensive series of experiments, Kellgren injected himself and his colleagues with hypertonic saline: injections into most soft tissues produced local pain, but injections into muscle consistently caused pain to be referred at a distance (Kellgren 1938). This has been amply confirmed in many studies since that time.
- MTrPs continuously generate spontaneous electrical activity of very low voltage (Hubbard & Berkoff 1993).
- The diagnosis of MTrPs can be made reliably by blinded examiners – if they are appropriately trained (Gerwin et al 1997).
- A hypothesis for a mechanism has been proposed (Mense & Simons 1999).
- MTrPs show greater density of immunoreactivity to substance P (a nociceptive neurotransmitter) compared with normal muscle (De Stefano et al 2000).
- The precise location of MTrPs can be identified reliably by two examiners independently (Sciotti et al 2001).
- Extracellular fluid surrounding an MTrP and collected by micro-dialysis (Shah et al 2005) contains higher concentrations than normal of several known nociceptor compounds that sensitize high-threshold nerve fibres in muscle. These compounds include protons (H+), bradykinin, calcitonin gene-related peptide, substance P, tumour-necrosis factor-α, interleukin 1-β, serotonin and noradrenaline (norephinephrine).

Many practitioners only discover MTrPs when they learn acupuncture; some describe it as a revelation in their medical practice, especially in primary

care, as they are now able to diagnose and treat many patients who were previously classified rather unsatisfactorily as 'functional', and perhaps dismissed as impossible to diagnose or treat.

Although MTrPs were described by Travell and Simons within the context of conventional medicine, they do seem to correlate rather well with aspects of traditional Chinese acupuncture. Common trigger points are often situated at known acupuncture points, and one landmark study found 100% correlation between MTrPs and acupuncture points (Melzack et al 1977). Traditional acupuncturists have been using *ah shi* points for many years: an *ah shi* point is one which, when pressed, causes the patient involuntarily to shout out *ah shi*, which means 'Oh yes!' ('... that is my pain'). In addition, many of the traditional acupuncture meridians are strikingly similar to the patterns of referred pain from trigger points.

MTrPs are an example of how the best of complementary and conventional approaches can be integrated; a significant step forward in patient care.

Definition

Travell and Simons defined an MTrP as a 'hyperirritable locus within a taut band of skeletal muscle, located in the muscle tissue or its associated fascia' (Travell & Simons 1983).

An MTrP is a hyperirritable locus within a taut band of skeletal muscle.

The essential clinical features of an MTrP are:

- a taut band can be palpated inside the belly of the muscle
- part of the taut band is very tender
- pressing that tender spot causes pain that the patient recognizes
- movement of the joint that stretches the muscle is restricted by pain.

Pressure on an MTrP replicates the patient's pain when pressed.

An MTrP may be *active* and cause stiffness and pain, or *latent* and cause stiffness without pain. An active MTrP may be inactivated by treatment, and a latent MTrP may be activated by a number of precipitating factors, described in Mechanisms.

MTrPs tend to occur in rather constant positions within muscles, for example the anterior border of the upper fibres of trapezius (Fig. 7.1). Our diagrams mark the trigger point with cross hatches (with the long strokes in the direction of the fibres) and the pain either in colour, or with cross hatching.

Many points in the body are tender: only MTrPs have the characteristic features.

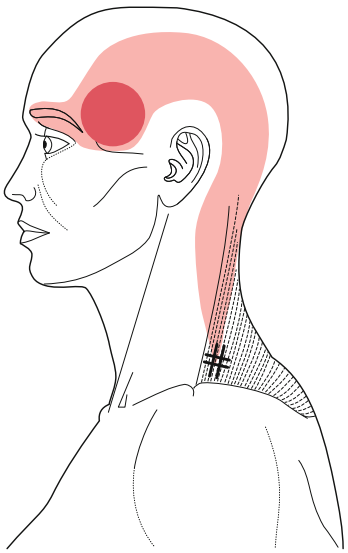

Figure 7.1 Trigger point in upper fibres of trapezius referring pain mainly to the neck and temporal region.

Incidence

MTrPs are common, and most people develop one or more during their lifetime. Physicians who are experienced in identifying trigger points could find at least one MTrP in about half of healthy, symptom-free young service personnel (Sola et al 1955). In one study in primary care, MTrPs were found in 30% of patients consulting for pain (Skootsky et al 1989). However, in reality they are not likely to be the *primary* cause of pain as frequently as this.

Aetiology

MTrPs may be caused by muscle injury or strain, but they may also occur secondary to other painful conditions. A strain that causes an MTrP in one patient may not bother a second patient – or even the same patient at another time, suggesting that there are other factors that make MTrPs more likely to develop. The same factors may prevent them healing.

Myofascial trigger points from acute or chronic muscle strain

Trigger points may arise rapidly in the few days following an acute strain of the muscle, or they may arise insidiously following chronic strain.

Most MTrPs are caused by muscle injury – acute or chronic.

The commonest acute strain occurs when the muscle is overloaded, for example from lifting something too heavy, or at an awkward angle. One muscle that is vulnerable to sudden overuse strain is pectoralis major (Fig. 7.2), commonly in young men with heavy occupations. Quadratus lumborum (Fig. 7.3), which is crucial in providing lateral support for the back, can easily be strained lifting a weight with one hand. In these cases, the onset of pain is usually rapid.

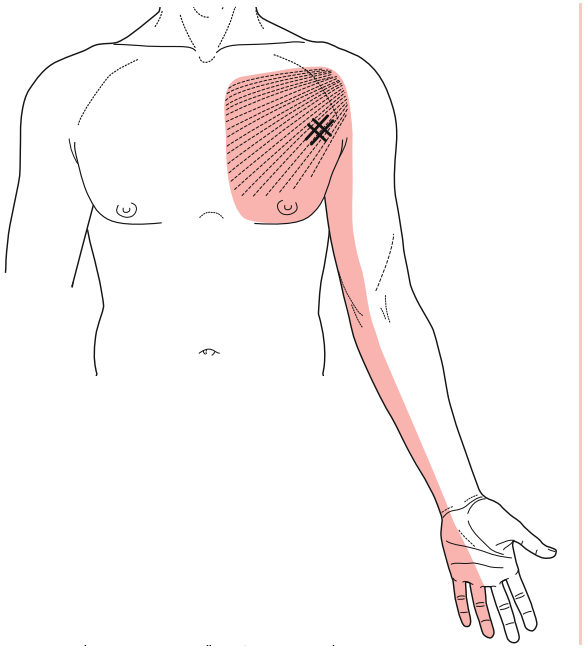

Figure 7.2 Myofascial trigger point in pectoralis major referring pain to chest and arm.

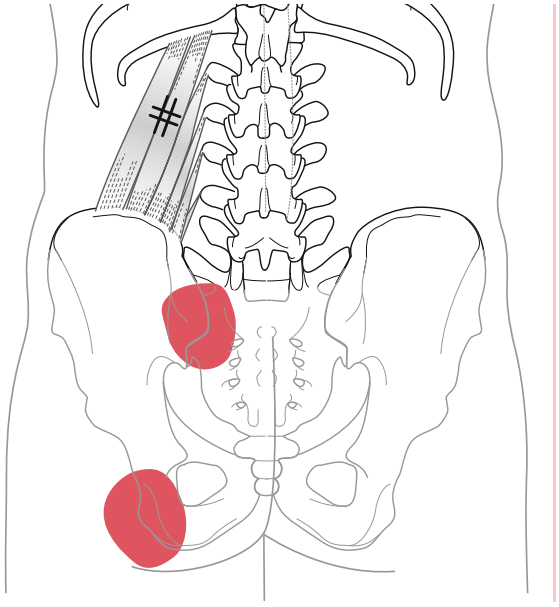

Figure 7.3 Myofascial trigger point in quadratus lumborum referring pain to sacrum and buttock.

Myofascial pain of gradual onset is likely to be caused by chronic, cumulative strain. This is common, for example, in the trapezius when many hours are spent in a poor working posture. A postural abnormality, such as kyphosis or scoliosis, puts extra strain on the muscles of the trunk (e.g. quadratus lumborum) or neck (e.g. trapezius). Constant mental tension can also produce prolonged muscle contraction: for example, tightly hunched shoulders may cause MTrPs to develop in the neck muscles, particularly trapezius.

Very occasionally, direct injury to the muscle can give rise to an MTrP, for example when it is compressed for a long period (e.g. sitting in a chair where the front edge compresses the hamstrings).

Because of the way MTrPs are caused by injury, they are often unilateral, though this is not always obvious in those that develop in the spinal muscles.

Primary MTrPs are usually unilateral.

Other causes of myofascial trigger points

MTrPs can develop in painful conditions, and then cause added problems for the patient. This is referred to as secondary myofascial pain. For example, arthritis of the hip is associated with MTrPs in the gluteal muscles, and MTrPs may develop in pectoralis major after myocardial infarction. This can lead to a confusing clinical picture as two diagnoses can be implicated for one set of symptoms. It is important to diagnose the original condition and give definitive treatment, but it may also be helpful to treat the MTrPs.

There is a strong relationship between the abdominal viscera and the muscles of the abdominal wall, via the nervous system. MTrPs can develop in the abdominal muscle wall after an acute condition, such as gastroenteritis, and subsequently cause pain and other symptoms, such as diarrhoea, even though the original condition has settled.

The diagnosis of an MTrP is not complete until an underlying cause is identified (whether injury or other condition).

Whenever pain occurs, including serious conditions such as cancer, an MTrP may also occur and confuse the diagnosis. Therefore, we cannot overemphasize the importance of making a conventional diagnosis.

Precipitating and perpetuating factors

Sometimes, the history of injury appears to be too trivial to have produced an MTrP, in which case the muscles may have been in a particularly vulnerable state. This can happen for a variety of reasons:

- Emotional: stress and anxiety, excitement
- Physical: exhaustion, poor muscle fitness from lack of exercise or exposure to cold
- Metabolic: poor nutritional status, low vitamin levels, hypothyroidism or chronic infection.

These factors that precipitate an MTrP also perpetuate it, and will also interfere with the response to treatment. They may need to be corrected before treatment can be successful and lasting.

Emotional, physical or metabolic factors can perpetuate an MTrP.

Mechanism

An MTrP is best regarded as a pathophysiological disorder rather than a purely pathological one, so 'mechanism' is a more appropriate term than 'pathology'. An MTrP feels distinctly hard, and it is surprising that microscopy of biopsy specimens shows little more than increased spacing between the fibres, a little leukocyte infiltration, and some contraction of individual sarcomeres.

Most research on the mechanisms of MTrPs has concentrated on the muscle fibres rather than the overlying fascia, and that is the approach that we reflect here. However, it is important to keep in mind that MTrPs may involve the fascia and the name 'myofascial' was originally introduced because the pain was produced by stimulation of the fascia, as well as the muscle.

Electrical activity has been detected from electromyography (EMG) needles placed within 1 mm of an MTrP (Hubbard & Berkoff 1993). This activity arises in muscle endplates, and is called 'miniature endplate potentials' (MEPPs). It shows the effect of the release of packets of acetylcholine (ACh) in an abnormal fashion. It is this persistent release of ACh that is the basic marker of an MTrP. Simons (Mense & Simons 1999) has proposed a hypothesis (Fig. 7.4) in which trauma to the endplate sets off the following sequence:

- Sustained release of ACh
- Inhibition of calcium pump
- Endplate depolarizes in an uncoordinated way, the potential is not propagated along the muscle cell wall
- Local contracture of sarcomeres in the immediate vicinity of the endplates
- Muscle shortening.

Although this is still a hypothesis and not yet an established mechanism, one of the predictions that arise from it has been supported in further experimentation: there is an accumulation of nociceptive transmitters around an MTrP (Shah et al 2005).

Clinical features

Presenting symptoms

Patients with active MTrPs usually present with a deep ache or pain. More rarely, they present with the associated stiffness or restriction of movement. Symptoms can vary greatly in severity – both between different patients, and over time in the same patient – often for no obvious reason.

MTrP pain is usually deep and aching, and fluctuates for no apparent reason.

The pain is usually referred away from the MTrP, and the painful zone may not even include the MTrP itself. For example, trapezius refers pain to the

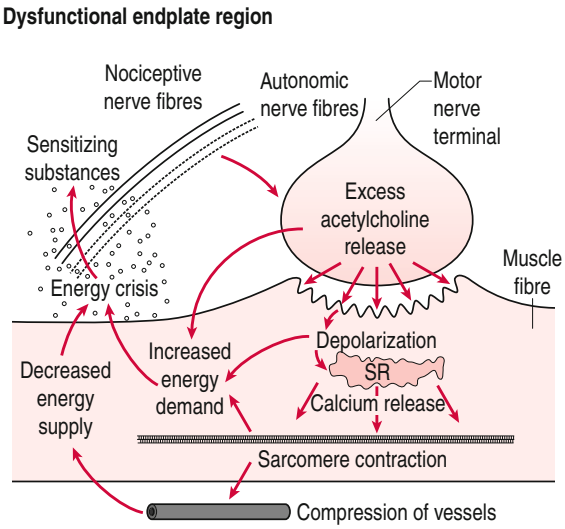

Figure 7.4 Integrated hypothesis of mechanism of myofascial trigger point. The primary dysfunction hypothesized here is an abnormal increase (by several orders of magnitude) in the production and release of acetylcholine packets from the motor nerve terminal under resting conditions. The greatly increased number of miniature endplate potentials (MEPPs) produces endplate noise and sustained depolarization of the postjunctional membrane of the muscle fibre. This sustained depolarization could cause a continuous release and inadequate uptake of calcium ions from local sarcoplasmic reticulum (SR) and produce sustained shortening (contracture) of sarcomeres. Each of these four highlighted changes would increase energy demand. The sustained muscle fibre shortening compresses local blood vessels, thereby reducing the nutrient and oxygen supplies that normally meet the energy demands of this region. The increased energy demand in the face of an impaired energy supply would produce a local energy crisis, which leads to release of sensitizing substances that could interact with autonomic and sensory (some nociceptive) nerves traversing that region. Subsequent release of neuroactive substances could, in turn, contribute to excessive acetylcholine release from the nerve terminal, completing what then becomes a self-sustaining vicious cycle. (Reproduced with permission from Simons D G, Travell J G, Simons L S 1999 Travell and Simons' Myofascial pain and dysfunction: the trigger point manual. Volume 1. Upper half of body. 2nd edn. Williams & Wilkins, Baltimore.)

neck and head, and there may be little pain at the site of the MTrP. The pain referral pattern for each muscle is reasonably consistent, so an accurate description is important in identifying the MTrP (Simons et al 1999, Travell & Simons 1983).

The patterns are often reminiscent of the 'channels' of traditional Chinese acupuncture, and they may well be the same phenomenon (Hong 2000). For example, the MTrP in trapezius is at the location of GB21, and the pain referral zone is remarkably similar to the Gall bladder channel as shown in Figure 7.5.

The pain pattern may reveal the location of the MTrP.

Patients with very active MTrPs show a characteristic clinical picture: the pain is deep, gripping and unremitting; the patient is restless, continually

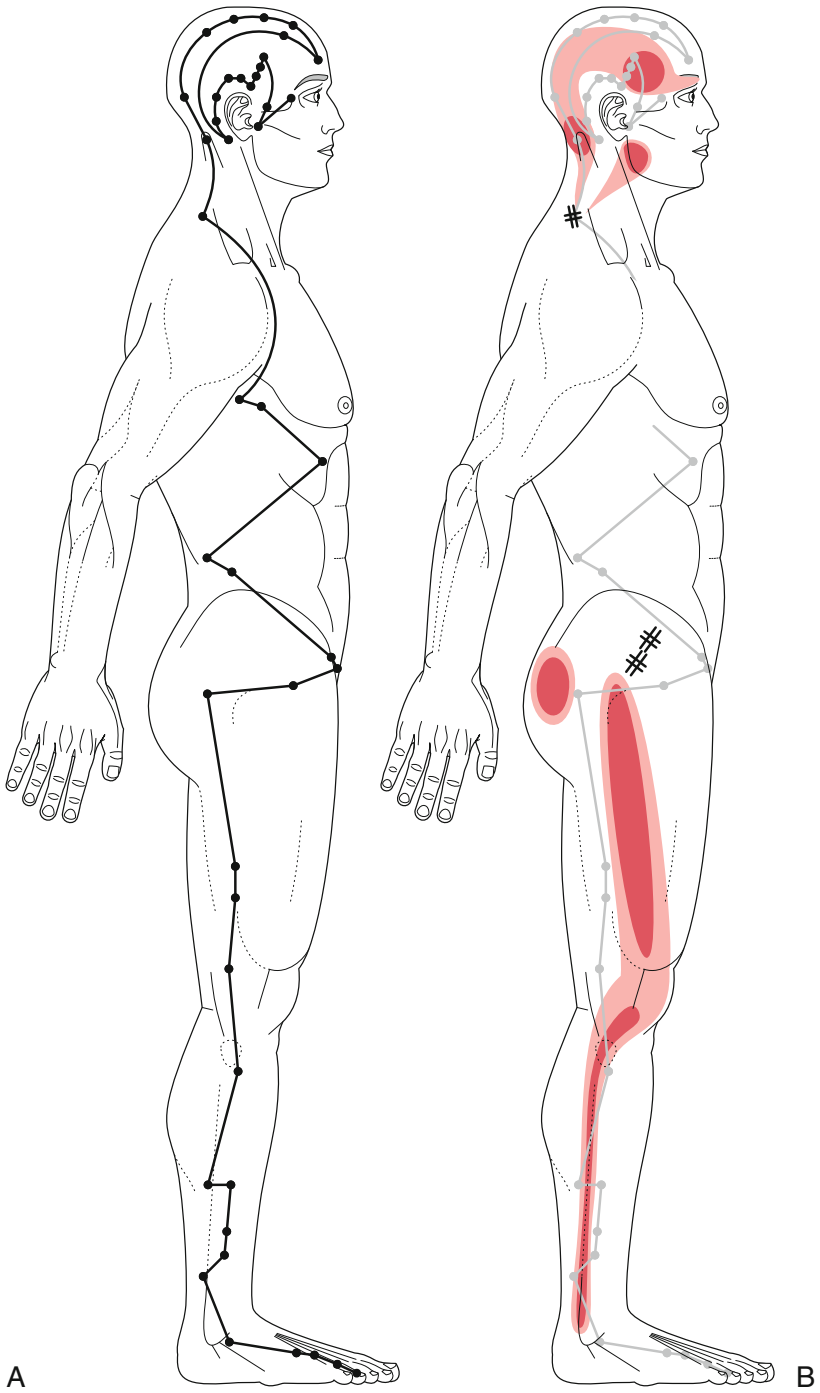

Figure 7.5 The correlation between trigger points and acupuncture points. (A) The trigger point in the upper fibres of trapezius is equivalent to the classical point GB21, and refers pain around the neck and head in a way that is remarkably similar to the GB meridian. (B) The trigger points in gluteus minimus are close to GB30 and GB31 (allowing for variation due to the patient's position) and refer pain down the leg to the ankle, in a pattern which is very close to the classical description of the GB meridian.

pressing deep and hard in the painful area, or stretching the affected part to try to relieve the pain. Movement may ease the pain and patients may even walk the streets at night in an attempt to escape the pain. If the patient can get rest in bed, the pain may be set off again if the muscle is kept shortened. For example, a patient with an MTrP in the left pectoralis major who sleeps on their side with the left arm folded across the chest is likely to wake in pain from the shortened muscle. Patients might sit or lie in an unnatural posture to keep the muscle in a lengthened position – the 'position of ease'. Patients often try to relieve the pain with a hot shower or bath.

The pain from an acute MTrP may simulate a medical or surgical emergency.

Less active MTrPs produce a less dramatic clinical picture: the pain and stiffness seem similar in many ways to the picture of osteoarthritis – which often co-exists. The pain is often deep and aching in nature, and the stiffness is worst after immobilization and eases with exercise.

History: direct questioning

It is important to obtain a precise history of the injury in cases of sudden onset, and details of work pattern in cases of insidious onset. Aggravating and relieving factors may help in establishing which muscle contains the MTrP. Pain due to MTrPs is often worse in cold weather, at times of stress and anxiety and, anecdotally, just before or during menstruation.

A few MTrPs have pathognomonic symptoms, such as the superficial prickling sensations over the chin and face from MTrPs in the platysma. Interested practitioners can discover these with experience, as long as they keep an open mind about the cause of 'peculiar' symptoms, and keep a copy of a detailed reference book close at hand, such as Travell and Simons' manual.

History: other symptoms

Occasionally, autonomic symptoms dominate the clinical picture: for example, one MTrP in the sternomastoid muscle causes dizziness and disorientation rather than pain.

The shortening and swelling of some muscles leads to pressure on nearby nerves and produces symptoms of nerve entrapment. For example, an MTrP in the piriformis can compress the sciatic nerve as it passes through the greater sciatic foramen. The patient may complain not only of the pain in a typical referral pattern, but also of paraesthesiae and numbness in the leg, as shown in Figure 7.6. This combination of symptoms is easily confused with sciatica caused by nerve-root compression.

Trigger points and spinal pain

MTrPs commonly cause spinal pain, or at least contribute to it. Low back pain may be produced by MTrPs in muscles of the various paravertebral groups (multifidi, longitudinal group, additional muscles such as quadratus

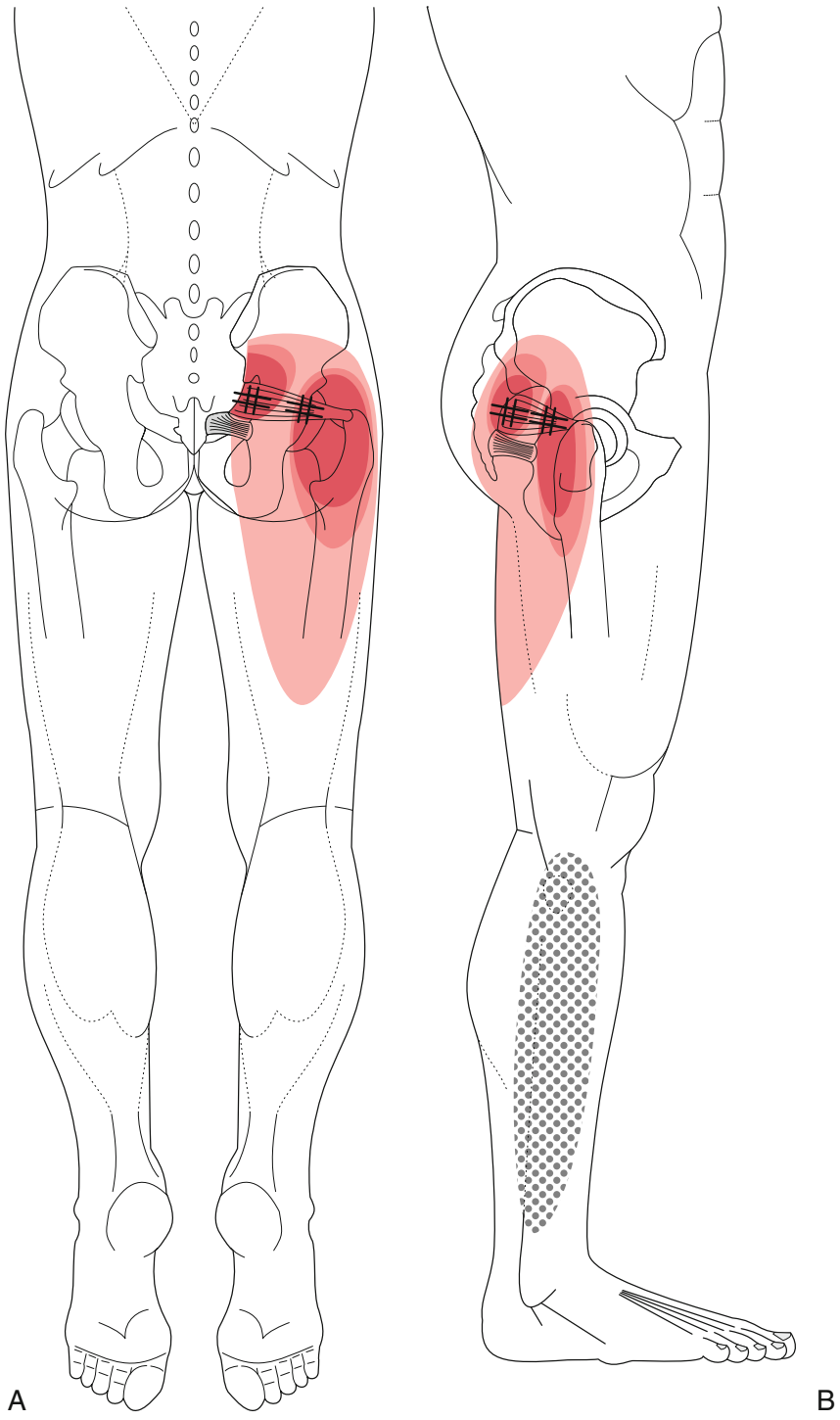

Figure 7.6 This figure shows trigger points in the (A) medial and (B) lateral sections of the piriformis muscle, which can lead to shortening of the muscle. This shortening compresses the sciatic nerve causing paraesthesiae in the lower leg. The important point to note is that paraesthesiae in the leg are not invariably caused by lesions to the nerve root.

lumborum) or the hip girdle such as piriformis. Neck pain may be due to MTrPs in the neck muscles, or in the shoulder girdle muscles, such as trapezius. Patients who have been told their X-ray films show 'degenerative change' may actually have pain that is due to MTrPs.

MTrPs may mimic other medical conditions.

Diagnosis

A convincing diagnosis of an MTrP can be made when the following features are found on history and examination:

- A history of pain that fluctuates for no good reason
- A taut band in the muscle
- An area of tenderness in the taut band
- Patient's pain reproduced by pressure on the tender area
- Passive stretch of the muscle restricted by pain.

Proper examination for MTrPs requires a good knowledge of anatomy, and many acupuncturists find they need to re-learn the attachments and functions of muscle.

Palpation

It is important to be able to identify an MTrP by palpation, to make the diagnosis and needle it precisely. It is crucially important to draw the fingers *across* the muscle, at right angles to the fibres. Many clinicians are used to feeling through muscles to the structure below: this is one of the rare occasions when it is the muscle fibres themselves that are of interest.

Firstly, prepare and position the patient so that the muscle is:

- not tense – the patient has to be warm, relaxed and comfortable, with the part well supported. This usually involves treating the patient lying down, with pillows for support
- accessible – a limb might have to be placed in a particular position; for example, pectoralis major in the anterior axillary wall can only be examined fully with the arm abducted; quadratus lumborum can only be accessed with the patient lying on the opposite side, with the upper leg lowered right on to the couch to open the angle between the ribs and the iliac crest
- the right length – if the fibres are fully stretched the taut band may not be palpable, if fully shortened the bulk of the muscle hides the MTrP. The appropriate length is achieved by moving the limb, for example increasing or decreasing the abduction of the arm when examining pectoralis major.

Examine for MTrPs by drawing the fingers across the muscle fibres.

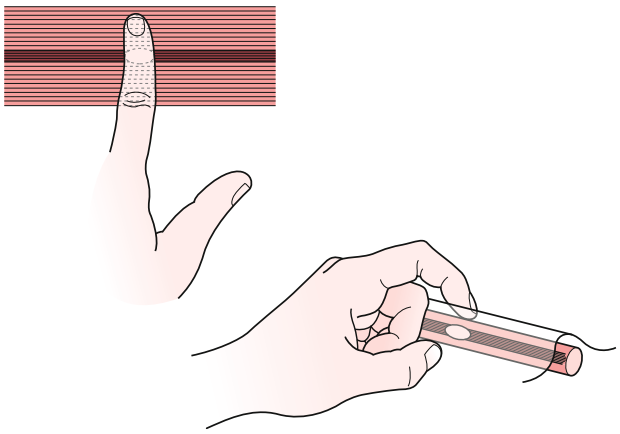

Figure 7.7 Diagrams showing flat palpation of myofascial trigger points and pincer palpation when the muscle belly can be encircled with the fingers.

There are two techniques for palpation: flat or pincer (see Fig. 7.7). In both cases the fingers are drawn across the fibres. Flat palpation is suitable for most muscles, such as quadratus lumborum or the medial portion of pectoralis major. But if part of the muscle can be lifted off underlying structures – for example, the upper trapezius, the lateral portion of pectoralis major in the anterior axillary fold, or the teres major and latissimus dorsi in the posterior axillary fold – the examiner's fingers and thumb encircle the muscle, and gently and systematically palpate it between the tip of a finger and the tip of the thumb. It does not take long to learn to recognize normal muscle fibre density and to identify the thicker, harder 'taut band', like a rope running the length of the muscle.

Having identified the band, then examine it gently for a tender spot, which is the MTrP itself, usually at about the midpoint. Finally, press on the tender spot for about 5 seconds and ask the patient what he or she feels. The best response is: 'That's my pain', i.e. pain recognition. Be careful not to hint that that is the response you want, as some patients will be eager to please you. The patient's pain is also likely to be reproduced by needling.

Forceful examination can aggravate MTrPs.

Twitch response

Trigger points may show another clinical sign on palpation – the twitch response – but remember that this may be painful and is not necessary for diagnosis. It is produced by 'snapping' palpation, which involves a firmer pull or tweak across the fibres, rather like twanging a guitar string in slow motion. It appears as a brief twitch under the skin, in line with the MTrP. It does not involve the whole muscle, like a tendon reflex, and should be distinguished from the effect of simply snapping the muscle border. Twitch responses

should be generated during treatment with the needle, since they are regarded as a sign that treatment is likely to be effective.

A twitch response, with pain recognition, from needling is likely to indicate a favourable outcome.

Difficulties in myofascial trigger point examination

Palpation is not always straightforward. In deeper muscles, such as piriformis, the MTrP is not accessible. In these cases, a careful history is important, and examination for limitation of range of movement and weakness. In addition, compare the two sides: MTrPs are generally unilateral, at least in the early stages. Accurate palpation is difficult in patients who are obese.

MTrP pain is usually limited to one side (or the midline).

Patients rarely have a single MTrP; other nearby muscles are also likely to develop MTrPs. It is important to note that both the target area and the trigger point may be tender: only the MTrP has the taut band, tender nodule and pain recognition on pressure. When practitioners first start examining muscles, they often find difficulty in distinguishing between tender points (there are often many) and MTrPs (there are usually few). The key to success is to concentrate on developing the feel for a taut band. Diagnosis becomes easier with experience and practice, but sometimes it is simply not possible to be sure if a particular tender point is the origin of the pain. In this case, it is entirely justifiable to treat the point speculatively, but carefully, as a 'therapeutic trial'.

Tenderness of the pain reference zone can be a distraction: the MTrP itself must be found.

Differential diagnosis

Suspect an MTrP if the clinical picture suggests a musculoskeletal condition (i.e. is related to activity), but does not precisely match another clinical diagnosis. Anomalous symptoms that are often labelled 'atypical' or 'idiopathic' could be due to MTrPs, for example atypical facial pain. Several conditions may give rise to MTrP pain that persists and may cause difficulty in diagnosing a chronic problem, as shown in Table 7.1.

Investigations

There are no investigations that can assist the diagnosis of MTrPs. Thermography has been suggested, but subsequently rejected as unreliable. Ultrasound and MRI have not, up to now, revealed any diagnostic features. Electromyography may be diagnostic, but is only relevant as a research tool. Blood tests are

TABLE 7.1

Myofascial trigger points that develop secondary to medical conditions and produce a similar clinical picture

Original condition	Persistent functional diagnosis	Muscles typically involved	Somatovisceral symptoms
Myocardial infarction	Post-infarction pain	Pectoralis major	Chest pain
Oesophagitis	Chronic epigastric pain	Rectus abdominis	Epigastric burning pain, nausea, anorexia, vomiting
Gastroenteritis	Irritable bowel syndrome	Rectus abdominis, internal obliques and external obliques	Pain, diarrhoea, constipation, bloating
Cystitis	Chronic cystitis	Lower rectus abdominis	Lower abdominal pain and frequency of micturition
Dysmenorrhoea	Chronic pelvic pain	Lower rectus abdominis	Cramping lower abdominal and pelvic pain

of no value, except that they may be useful to exclude hypothyroidism if this is clinically suspected, because it may cause resistance to treatment.

Treatment techniques

Needling is not the only way to treat MTrPs, but it is quick and effective. This section is not intended on its own to give enough information to guide treatment with needles: full details of needling techniques are given in Chapter 12. There are four general approaches to needling MTrPs:

1. Direct deep needling, which means inserting the needle directly into the MTrP itself. This is swift and effective for acute MTrPs. The practitioner must know the local anatomy to avoid serious harm. Very often the MTrP is not located on the first thrust of the needle, and repeated thrusts are needed, spreading in a fan-like pattern from the skin insertion point (called 'fan-like lift and thrust') (Fig. 12.2). Direct needling seems to have a local effect, but it is not clear precisely what that is: it may simply physically disrupt the dysfunctional unit, and perhaps provoke local vasodilation, which assists tissue healing.
2. Superficial needling, which is simply inserting the needle into the tissues precisely over the site of the MTrP. When using this method, it is essential that all tender MTrPs are treated together in the treatment session, and that treatment is repeated until they are no longer tender.

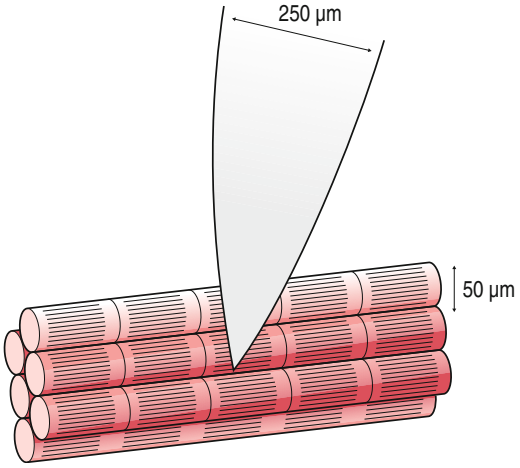

Figure 7.8 Tip of acupuncture needle in relation to skeletal muscle fibres, drawn to scale.

The mechanism of this effect is unknown, and not based on obvious anatomical connections since the overlying skin usually has different innervation from the MTrP. It is very acceptable to patients, and unlikely to cause reactions. It is particularly useful for treating MTrPs situated in an anatomical area where deep needling carries excess risk, for example in the anterior neck or just medial to the scapula.

3. Needling local classical Chinese acupuncture points seems to have some effect on MTrPs, from clinical observation.
4. Electroacupuncture (see Chapter 12) is mainly used to treat chronic MTrPs. Insert one needle into the MTrP, the other a few centimetres away along the MTrP band.

After needling MTrPs, ask the patient to move the affected part through its full range of movement, slowly and deliberately, to achieve a gentle stretch. This helps to inactivate the MTrP and re-educate both the muscle and its owner that the muscle shortening has been abolished and the range of movement is normal. At the same time, warn patients not to overload the muscle.

After needling, stretch the muscle slowly – but do not overload it.

Patients should also be warned that they may feel soreness in the muscle for a few hours after treatment, and can use a hot-water bottle, bath, shower or their usual analgesic medication for relief. Simple analgesics seem more effective than non-steroidal anti-inflammatory drugs.

These recommendations on needling are based on clinical experience, since there is little definitive research on treatment techniques. Some practitioners, particularly in America, inject MTrPs with local anaesthetic, saline, steroid solution or botulinum toxin, but a systematic review found none of these was superior to dry needling (Cummings & White 2001). Botulinum toxin has a theoretical advantage since it blocks release of acetylcholine and thus may 'switch off' the pathological mechanism of the MTrP at source, but early

studies have been disappointing. Other physical therapies that are likely to work for MTrPs include deep massage and stretch of various sorts.

Prognosis

MTrPs of recent onset, limited to a single muscle and not overly active, may respond very swiftly to needling, possibly even to a single treatment. However, when MTrPs have developed in several muscles in a group and have been present for more than about 6 months, treatment needs to be repeated weekly for several weeks and patients may need to work hard at active stretching exercises between treatments to reinforce the effect of needling. Even so, the MTrP may not dissipate permanently, but revert to being a latent MTrP.

A patient can reduce the likelihood of reactivating latent MTrPs by continuing a daily stretching routine, keeping the muscle warm, and avoiding overload, which includes correcting underlying ergonomic or postural stresses.

It is interesting to note that some patients who have had successful MTrP therapy feel a major improvement in their general wellbeing. The physical limitation, pain and the sleep disturbance caused by the MTrP had adverse effects on their lives in ways that they had not recognized until they were treated. This fact may contribute to the improvement in wellbeing that is frequently reported as a general benefit after acupuncture treatment.

Summary

MTrPs arise when a muscle or its associated fascia fail to heal after injury, and should be distinguished from other tender points. MTrP pain is probably under-diagnosed through lack of awareness of the condition. Sufficient clinical and scientific evidence has accumulated for it to be considered in a differential diagnosis.

The cause of MTrPs is usually acute injury or chronic cumulative strain from postural problems or repetitive activity. They may also arise in other painful conditions, for example in the abdominal muscles from referred visceral pain. They occur at relatively fixed positions in each muscle.

Certain factors precipitate and perpetuate MTrPs, including strong emotions, physical states such as exhaustion, and certain metabolic conditions, including hypothyroidism.

One hypothesis for the mechanism of MTrPs involves sustained release of acetylcholine at the muscle endplate and sustained contraction of individual sarcomeres. This creates additional energy demands, but impedes circulation, thus perpetuating the problem and releasing nociceptive transmitters.

Patients with MTrPs usually present because of the pain. The trigger point may vary in activity from acutely painful, through chronic persistent pain to latent, i.e. only causing stiffness. The pattern of pain is typical for each individual trigger point and may assist in finding the point. MTrPs commonly contribute to the overall picture of spinal pain, whether or not other pathology is

present. MTrPs frequently cause symptoms that mimic other conditions. The predominant clinical features of MTrPs are the palpable taut band, tender point and patient recognition of pain.

Treatment with acupuncture usually involves deep, precise needling of the MTrP, though some recommend superficial needling. Electroacupuncture is sometimes used for chronic cases, although this is the one circumstance where vigorous manual needling may be more effective if tolerated by the patient. The patient should put the affected muscle(s) through a complete range of movement after needling. The prognosis is good, provided the MTrP is treated early and perpetuating factors can be removed. Chronic MTrPs may be successfully inactivated with repeated treatment, but are less likely to be abolished permanently.

Further reading

Baldry P E 2005 Acupuncture, trigger points and musculoskeletal pain. 3rd edn. Elsevier, Edinburgh

This text provides a thorough explanation of the most common myofascial trigger points encountered in practice. The author recommends treatment by superficial needling.

Simons D G, Travell J G, Simons L S 1999 The trigger point manual. 2nd edn. Williams & Wilkins, Baltimore

This pair of books is expensive, but regarded as the canon of myofascial trigger points pain. Full of terrific detail and wonderful anatomical diagrams to serve as a handbook for life time of practice.