

Connective tissue massage

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Connective tissue massage (CTM) is a manipulative technique that facilitates the diagnosis and treatment of a wide range of pathologies. Observation and subsequent manipulation of the skin and subcutaneous tissues can have a beneficial effect upon tissues remote from the area of treatment. These effects appear to be mediated by neural reflexes that cause an increase in blood flow to the affected region together with suppression of pain. CTM is becoming accepted more widely as research confirms the claims of an expanding population of practitioners.

Keywords: Connective tissue, massage, manipulation, physiological and therapeutic effects

Connective tissue massage (CTM) is a manipulative therapy distinct from traditional massage in both technique and physiological effects. CTM has gained in popularity as therapists introduced to it during their initial training observe and report the various therapeutic benefits more widely. This renewed interest also follows the continuing exploration of alternatives to orthodox Western medicine. These manipulative procedures are directed at the superficial connective and subcutaneous tissues and have an effect upon organs distant from the site of local stimulation in a manner not yet understood fully.

The techniques were developed in 1928 by the German physical therapist E. Dicke. A sufferer from lumbosacral pain, she used vigorous stretching strokes on her own back to relieve the discomfort. Fortunately, she also observed that in her legs, which were affected by endarteritis obliterans, a sensation of tingling and warmth followed the back treatment. Regular therapy correlated with a gradual improvement in blood flow and the seemingly irrevocable onset of gangrene was avoided¹. These phenomena were investigated further and the techniques developed into those used today²⁻⁴.

CTM is characterized by robust and sometimes uncomfortable distortion of the connective and subcutaneous tissues, and as such is more akin to manipulation than massage (Figure 1). The technique

can be time consuming and became unpopular as the reliability of drug treatments, electrotherapy and other manipulative procedures improved.

The principles of CTM rest upon the empirical observation that dysfunction of an internal organ is reflected in the increased tone of superficial muscles, especially of the back (Mackenzie's zones), and a changed character of interstitial fluid in the subcutaneous tissues together with hypersensitivity to touch (Head's zones). Such signs are usually distributed in the dermatomes corresponding to the segmental innervation of the affected organ^{5,6}. A beneficial therapeutic effect is directed at the diseased organ by stimulating mechanically the appropriate dermatome. Primarily, although not exclusively, the dermatome is stimulated as it appears on the dorsal surface of the trunk. The therapeutic effects seem to arise from altered blood flow within the deep tissues or as a result of pain suppression.

Such interactions between the deep and superficial tissues are mediated by neural mechanisms known as cutaneovisceral reflexes^{7,8}, which involve both the autonomic pathways and the rich somatic sensory plexuses present in the skin and subcutaneous tissues^{9,10}. These referred phenomena arise in addition to the well documented local responses to traditional massage, which include the alleviation of muscle spasm, increased mobility of connective tissue, superficial hyperaemia and local analgesia¹¹.

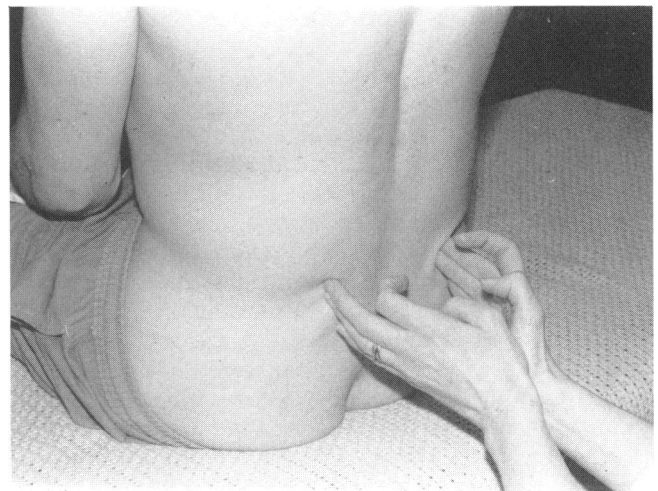


Figure 1. The initial stages of connective tissue massage

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Connective tissue massage techniques

Accurate assessment is essential if therapy is to be successful. The patient sits with his or her back exposed to the therapist who first observes the contours of the skin and then palpates the subcutaneous tissues, either by a series of small symmetrical finger pulls (the skin and subcutaneous tissues are lifted at a tangent away from the underlying fascia) or by long pulling strokes that pass over the whole length of the back. Once Mackenzie or Head zones are identified, they must be interpreted. Usually the zone will reflect a dermatome that corresponds to the segment containing the diseased tissue. Occasionally this correspondence is not exact, or may even relate to sites of previous or potential disease. Once assessment is complete the treatment session begins.

A detailed description of the therapeutic technique appears elsewhere^{2,3,4,9} although the main elements may be summarized thus. Treatment commences with a series of short strokes over the sacrum, lumbar spine and posterolateral pelvis, which are developed into longer paravertebral and subcostal strokes. The pressure is firm and may feel like an uncomfortable scratching or cutting. CTM induces a triple response, and once the condition of the subcutaneous tissues in the massaged region returns to normal, treatment can progress to the thoracic and cervical regions of the spine, the limbs and the head. Short paravertebral strokes precede those passing from the transverse to the spinous processes. Once developed into longer strokes (*Figure 2*), the massage then fans out from the line of the vertebrae to follow the intercostal spaces towards the scapulae and the occiput. Manipulation of the thorax frequently has a marked effect upon autonomic function and patients may report palpitations or dizziness; a minority may even faint^{2,3,12}.

Indications and contraindications

The indications for CTM may be subdivided into those recognized by practitioners in Germany, where the technique has a long history and is well accepted, and those accepted by the more conservative British and North American therapists.

German experience indicates that CTM can benefit patients suffering from cardiac and respiratory diseases, peripheral circulatory deficits, neurological pathologies, gynaecological and obstetric problems and disorders of the digestive and urinary tracts. The other community of therapists, although accepting some of these recommendations, use CTM primarily to relieve the symptoms of spinal and peripheral joint dysfunction, osteoarthritis and rheumatoid disease, nerve root pain, sciatica and neuralgia⁴.

The contraindications to CTM are few. The most important include restrictions on the treatment of patients with malignancy, acute inflammation or closed abscesses, and those who are in the third trimester of pregnancy. Patients with a history of hypotension or who are menstruating should be treated with considerable caution.

Physiological effects

The physiological effects of CTM are both local and general. Local effects include release of histamine from mast cells which leads to a triple response, local swelling and arteriolar dilatation mediated by local axon reflexes. The increased blood flow to the region assists the resolution of subacute or chronic inflammation and reduces pain by removing nocigenic chemicals from the tissues. The mechanical distortions produced by CTM strokes help to mobilize connective tissue and improve function in much the same way as traditional massage.

The value of CTM lies with the capacity to induce more generalized alterations in physiological state, and for this reason the technique has become used more widely. Effects appearing in the deep tissue distant from the site of superficial stimulation are mediated by the autonomic nervous system and are expressed as changes, usually an increase, in blood flow and a reduction of pain. CTM appears to affect the parasympathetic system preferentially¹³. Others consider that, after a delay, the sympathetic system is also stimulated¹⁴. Little good quality research verifies these statements, although in one such example the authors report that CTM applied to the sacral region increased blood flow to the foot measurably³, thus supporting the earlier observation of Dicke. Empirical

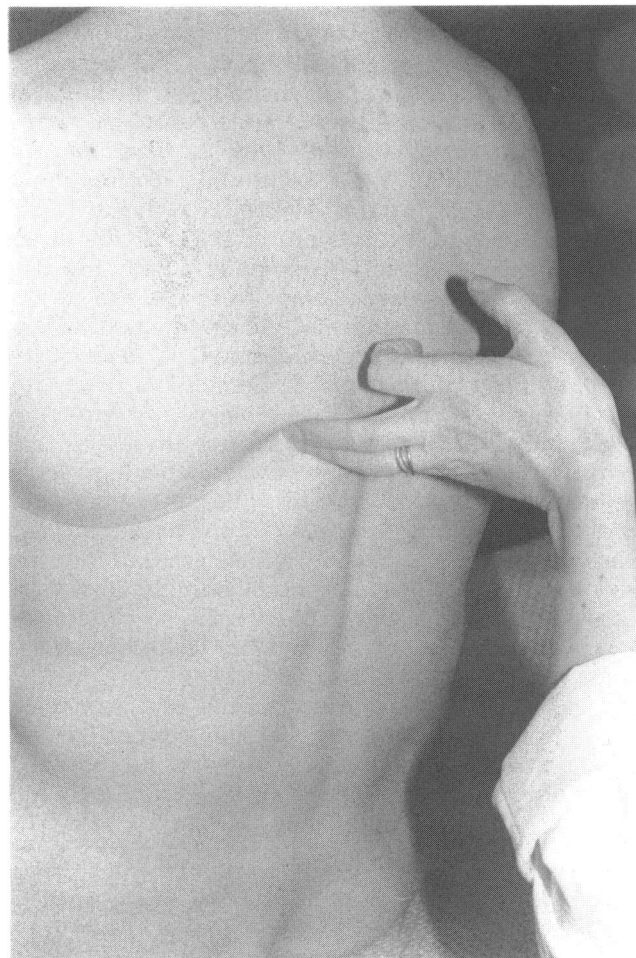


Figure 2. Connective tissue massage consists of pull strokes that vigorously stimulate and mobilize the tissues

observations are reported frequently in the literature^{2, 3, 15, 16}.

This type of manipulation also appears to exert a powerful analgesic action⁴. Vigorous stimulation of cutaneous mechanoreceptors by CTM probably activates the 'pain-gating' mechanism: i.e. it reduces discomfort by blocking the transmission of information along small diameter peripheral sensory fibres that carry pain to the ascending pathways in the spinal cord^{17, 18}. This mechanism is active during physical therapy designed to control pain by using other manipulative techniques¹⁹ or electrotherapy²⁰.

Most recipients would agree that CTM is not comfortable, and as such the strokes may also activate the 'descending pain suppression mechanism'^{21, 22}. Noxious stimuli pass from the periphery to the brain, initiating reflex activity leading to the release of endogenous opiate substances in the spinal segment at which the pain bearing nerves enter. Analgesia thus induced lasts longer than that arising due to pain-gating²².

Some authors claim that endocrine function is also affected by CTM²³, particularly the levels of hormones controlling the menstrual cycle^{24, 25}.

Conclusion

Connective tissue massage can be used as a tool for diagnosis or therapy. Dysfunction of deep-seated organs is reflected in the changed character of subcutaneous tissue. Suitable mechanical stimulation can increase blood flow and reduce pain in these inaccessible tissues and allow the restoration of normal function^{2-4, 15, 26}. The claimed therapeutic benefits of CTM are diverse, many relevant to the treatment of sports injuries, and all merit further investigation.

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