

# CLINICAL IMPORTANCE OF ACTIVE SCARS: ABNORMAL SCARS AS A CAUSE OF MYOFASCIAL PAIN

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## ABSTRACT

**Background:** Active scars are a model of soft tissue lesions. Soft tissues surround the locomotor system everywhere. These tissues shift and stretch in harmony with joints and muscles. Active scars interfere with this type of movement, thus disturbing the function of the entire motor system.

**Objective:** The purpose of this article is to show the importance of such scars, their diagnosis, and the importance of manipulative therapy.

**Methods:** After discussing the diagnosis, 51 cases are presented, the majority being scars after operation. The patients suffered from various types of myofascial pain from all sections of the locomotor system. The type of operation and the clinical symptoms are given. The method of treatment is soft tissue manipulation, making use mainly of the barrier phenomenon.

**Results:** In 36 of the cases, treatment of scars proved highly relevant, giving striking results at first treatment and in the course of therapy. In 13 further cases, the scar was partly relevant, ie, one of several pathogenic lesions. It proved irrelevant in 3 cases.

**Conclusion:** The treatment of active scars can be of importance in a great number of cases; untreated, active scars are an important cause of therapeutic failure. Treatment also widens the scope of manipulative therapy. (J Manipulative Physiol Ther 2004;27:399-402)

**Key Indexing Terms:** *Myofascial Pain; Soft Tissue; Chiropractic Manipulation*

## INTRODUCTION

As early as in the 1930s, the brothers Huneke (who were not physicians) injected scars with Novocain, obtaining surprising effects mainly in painful conditions of the type now diagnosed as myofascial pain syndromes. They ascribed the therapeutic effect entirely to Novocain. So prompt was the effect that they coined the term “Sekundenphenomen” (effect within a second). This was the beginning of “Neuraltherapie,” making use of Novocain for painful conditions (mainly in Germany). It was later found that it did not matter what was injected and finally that the same effect could be brought about by just using the needle. It was therefore no coincidence that the

same therapists finally adopted acupuncture. In this development, however, the scar was largely forgotten.<sup>1-5</sup>

An important change took place when we made soft tissue manipulation part of our routine diagnosis and therapy. The importance of soft tissues for functioning of the motor system is widely underrated. This is so because we are not sufficiently aware that every movement of the trunk or extremities is accompanied by a corresponding movement (stretch and/or shift) of the soft tissues surrounding muscles, joints, and bones. This is also true of visceral organs. These synkineses have hardly been studied; hence, norms do not even exist. Clinical experience has taught us that impaired mobility of soft tissues can greatly impair motor function and that both trigger points (TrPs) and joint movement restriction recur as long as soft tissue mobility is not restored. This is true particularly with fascia.

At first glance, it may seem that our muscles are sufficiently strong to overcome such obstacles. The way both muscles and joints react to soft tissue treatment can be explained best by reflex inhibition. This is also borne out by some manual fixation techniques where fixation is achieved by using minimal force.

For both diagnosis and treatment, the barrier phenomenon is essential (Fig 1). As in joints, there is always a range

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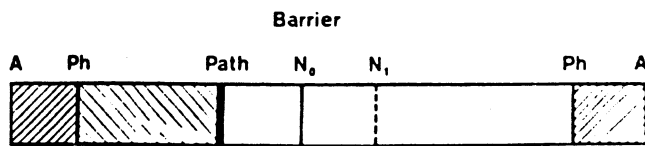
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**Fig 1.** The barrier phenomenon: A, the anatomical barrier; Ph, the physiological barrier; Path, the pathological barrier; N<sub>0</sub>, the neutral point; N<sub>1</sub>, the pathologically shifted neutral point.

of movement in which there is next to no resistance to stretch or shift. The moment the first resistance is met, the barrier is reached. Under normal conditions, this barrier is soft and can easily be sprung or shifted. Under pathological conditions, however, the barrier is abrupt, does not spring (“end feel”), and restricts movement. For treatment, we engage the barrier, and after a short latency, release is obtained (Fig 1).<sup>6-8</sup>

Just as for TrPs, palpation is essential, since both increased resistance and release must be sensed. Only palpation enables us to feel where the patients experience pain; the TrPs, as well as other painful soft tissue changes, are diagnosed by increased (altered) resistance on palpation.

Scars affect soft tissue in all its layers from the skin to the subcutaneous tissues, the superficial and deep fascias, the muscles, and even the tissues of the abdominal cavity. If the scar is perfectly normal, clinical examination will show no changes whatsoever. Once soft tissue changes occur, we speak of “active scars.”

The characteristic findings on the skin are increased skin drag, owing to increased moisture (sweating); skin stretch will be impaired and the skin fold will be thicker. If the scar covers a wider area, it may adhere to the underlying tissues, most frequently to bone. In the abdominal cavity, we meet resistance in some direction, which is painful. Just as with other soft tissue, after engaging the barrier and waiting, we obtain release after a short latency, almost without increasing pressure. This can be of great diagnostic value, because if after engaging the barrier the resistance does not change, this is not due to the scar but to some intra-abdominal pathology.

Not all layers of the scar need to be active; we should therefore examine all layers for adequate treatment. This can be difficult. For cosmetic reasons (in surgical scars), the skin is incised where it is less seen, but the operation is carried out in deeper layers at a distance from where the skin was cut. That, however, is where the deeper layers must be treated. In laparoscopy, there is hardly any lesion at all at the surface.

After having diagnosed an active scar, the crucial question is whether the scar is relevant, ie, whether its treatment will have an effect on the patient’s condition the way Huneke<sup>1</sup> described it. To make this possible, it is essential to make a complete examination of the patient, ie, find all

TrPs, joint dysfunctions, and also soft tissue changes but without giving any treatment whatsoever. The scar has to be treated first, and only then will we reexamine all clinical findings. If the active scar is relevant, we find that, with some exceptions, everything will have reverted to normal. But even that can be misleading. The effect has to be lasting, so that the patient will still be improved at the control examination at least 2 weeks later. If this is true, we know the active scar is relevant and how further rehabilitation should be conducted.

Anamnestic data are important if the complaints of the patient can be traced to the period following the injury (operation) producing the scar. Stressful situations like infectious diseases can activate or reactivate scars.

## METHODS

Since 1998, we have had 51 patients under observation (38 female patients, 13 male patients; aged 16 to 85 years [average age 50]).

### Inclusion Criteria

Inclusion criteria included myofascial pain syndrome and a sufficient number of control examinations to assess the results of treatment.

The main complaints were low back pain (14), pain in the arm and shoulder (14), headache (8), neck pain (3), pain in the thoracic region (3), back pain at several sections (4), abdominal pain (2), vertigo (3), and root pain (2).

There were scars after appendectomy (18), breast operation (11), gynecological operation (4), thorax operation (3), extremity operation (injury) (2), cholecystectomy (2), inguinal hernia (2), laminectomy (2), thyroidectomy (2), orchectomy (1), hip replacement (1), umbilical fistula (1), muscle tear of the rectus abdominis muscle (1), pylorostenosis (1), operation of the rectum (1), and laser treatment of a duodenal ulcer (1).

### Treatment

Treatment is aimed at restoring skin stretch close to the scar and making all soft tissue layers affected by the scar shift normally one against the other, ie, the skin, the subcutaneous tissues, and the superficial and deep fascias. If the scar is close to bone, treatment is aimed at restoring its mobility against bone. In the abdominal region, scars frequently involve the abdominal cavity, where painful resistance in 1 or several directions is felt. Treatment proceeds from the superficial layers into the deep layers by tissue manipulation, which is very gentle. A great advantage of manual techniques is that the hand is an instrument which senses, establishing a feedback relationship.

In every tissue layer we proceed by the barrier phenomenon; we engage the barrier with minimum force and wait for

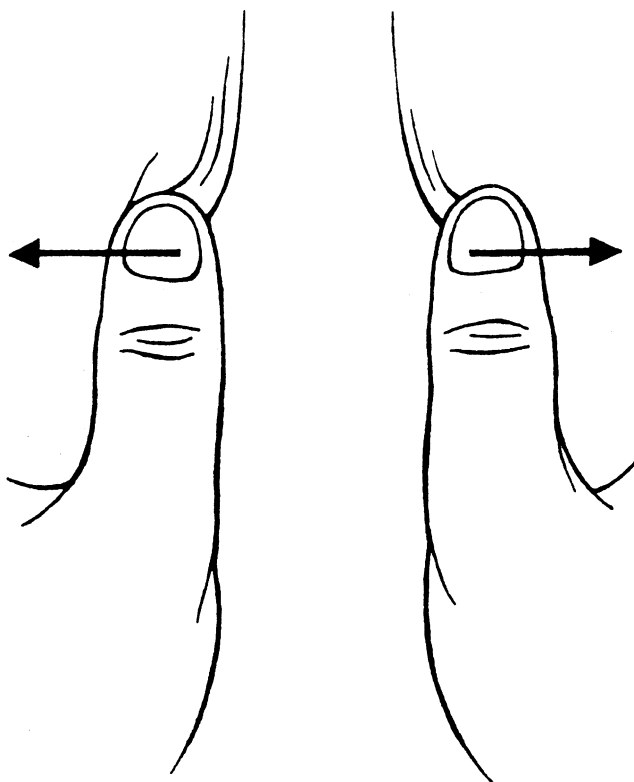


Fig 2. Skin stretch.

release. This has to be followed to the end without changing the force but, if it is convenient, with changing direction. Treatment is stopped when release has been completed in all directions and layers.

The principles outlined here were adhered to throughout, except in a few cases which will be detailed later. Treatment was given 2 or 3 times a week for a total of 12 sessions, covering 4 to 8 weeks, and followed by control examination 2 to 3 weeks later.

The course of treatment included:

1. We began each session by stroking the whole area of the scar and the area around it for relaxation.
2. This was followed by skin stretch in all directions (Fig 2).
3. This was followed by the application of a hot pack. This consisted in the short application of a rolled bath towel soaked in boiling water. This was combined both with shifting the soft tissues and with pressure. It should not, however, be applied to cases after breast operation for fear of provoking recurrence of cancer.
4. After application of the hot pack, we stretched a fold of connective tissue and restored mobility of all connective tissue layers involved with the scar (Fig 3).
5. Where resistance was found in the depth, most frequently in the abdomen, simple pressure was applied in the direction of the pathological barrier.

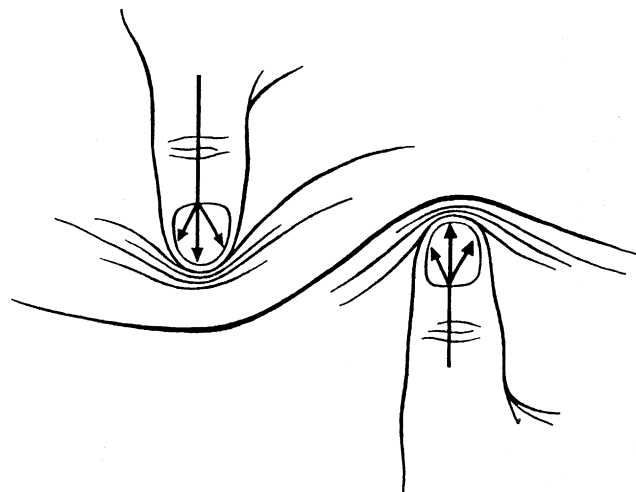


Fig 3. Stretching of a soft tissue fold.

6. If scars were adhered to the bone (periosteum), we made them move (shift) freely.
7. Every session ended with stroking the scar and its surroundings to obtain relaxation.

In abdominal scars, point 6 is irrelevant. In scars in the thoracic region, it is important to restore tissue mobility at the ribs, particularly at the angle of the rib and at the sternum close to the sternocostal joints. Mobility against the periosteum after operation of the spinal column and the coccyx is also a matter mainly of the spinous processes and the posterior superior iliac spine.

After operation on a limb, points 1, 5, and 7 need not be followed, except for the sole and the palm.

Patients after breast operation need special consideration. They have psychological difficulties and react particularly well to stroking (points 1 and 7). It is important to treat soft tissues that may be at a distance from the scar, which is visible on the skin. Here, we do not apply hot packs (point 3), but we have added respiratory exercise to restore normal respiration. Nor did we apply hot packs to a patient after surgery for melanoma. In a case with a torn straight abdominal muscle in which the skin was intact, only hot packs and pressure were applied where resistance was increased.

It is important to point out that very frequently the most active section of a scar is at the ends, and it is there where treatment must be applied.

## RESULTS

The scars were considered relevant in 36 of 51 cases, ie, their treatment produced marked immediate results at first examination and further treatment of the scar played a prominent role in the course of therapy and rehabilitation. In 2 of these cases, it was the scar that caused recurrence, and treatment was effective each time.

The scars were partly relevant in 13 cases, and treatment produced no results in 3 cases.

## DISCUSSION

The overwhelming majority of active scars are due to an operation, ie, a complication of surgery, yet are completely ignored by surgeons. The activity of the scar seems to be in no relation to its age; it may date from early childhood. There seems to be a higher incidence if there is suppuration and healing per secundum (eg, after appendectomy); keloid formation, however, has no significance.

In typical cases, the diagnosis is easy for those familiar with soft tissue techniques. All layers of the scar, in particular on the surface, show signs of activity, ie, increased skin drag, restricted skin stretch, a thicker and tender skin fold, resistance to shifting against underlying tissues including bone. But in less typical cases, there can be problems. In breast and gynecological operations, for cosmetic reasons, the surgeon may locate the skin incision so as not to be very visible and then perform the operation at a distance. We therefore have to look for resistance (pathological barriers) in the deeper tissues at a distance from the superficial incision. This is even worse if the operation is carried out by laparoscopy or laser, causing no changes on the surface but important soft tissue changes in the deeper tissue layers.

Another problem is differential diagnosis. If resistance is felt in the deep tissues, eg, in the abdominal cavity, it can be due to pathology or to an active scar. We have to rely on palpation. If after engaging the barrier we obtain release after a short latency, the resistance "melting away," pressure exerted by the therapist is no longer painful, and most symptoms have cleared up, we can conclude that an active scar is the cause. If there is pathology, no such effect is obtained and resistance remains unaltered. We have repeatedly sent patients to surgeons (gynecologists) after this type of examination.

Without going into detail, the importance of active scars can be illustrated by some examples. A patient with severe abdominal pain for 5 years had been repeatedly hospitalized undergoing the innumerable examinations of modern technical medicine for such conditions, and (as frequently happens if nothing can be found) the patient was suspected of malingering and was sent to psychiatry or to rehabilitation. In this case, the scar (after appendectomy) was so active that he could hardly bear us to touch it, let alone treat the deep layers, but with gentle techniques, he dramatically recovered.

Another elderly patient complained of severe low back pain of 5 years duration after an operation by laser for a duodenal ulcer. With this information, we looked for resistance and found it below his navel on the right; after

obtaining release, the patient improved dramatically. Treatment was repeated with excellent results.

A patient with pain in her arm and shoulders had given birth 3 years earlier to a baby of over 4 kg, after which she had not only bled heavily but also had had a high temperature and been treated by antibiotics. Her shoulder pain began soon afterward. Three years later she came to our department. This history led us to examine her lower abdomen, where typical resistance was met on the left. After treatment, most of her symptoms in the arm and shoulder were greatly improved. One local treatment of the cervicothoracic junction was followed by total recovery.

Treatment of active scars is important not only because it frequently gives excellent results but also because if active scars are left untreated, they constitute a perpetuating factor which may frustrate all our therapeutic efforts. If we have diagnosed an active scar, it is essential to start treatment at the scar to assess its relevance, ie, to decide to what an extent treatment of the scar can improve the clinical picture, by testing TrPs, joint movement restriction, and the relief the patient feels. If there is marked improvement, further treatment of the scar is indicated. If there is no such response, we treat those changes that we consider most relevant.

## CONCLUSION

Treatment of active scars makes use of soft tissue manipulation. It is not just a form of massage, since for diagnosis and treatment, it makes use of the barrier phenomenon and release. We have to engage the barrier and obtain release, as in any other form of manipulation or mobilization. Thus, the scope of manipulative treatment is greatly widened. If the scar is relevant, it may be the most effective type of treatment; untreated, it may be the cause of therapeutic failure and recurrence.

## REFERENCES

1. Huneke F. *Krankheit und Heilung anders gesehen*. Koln, Germany: Staufien; 1947.
2. Dosch P. *Lehrbuch der neuraltherapie nach Huneke*. Ulm, Germany: Haug; 1964.
3. Gross D. *Therapeutische lokalanasthesie*. Stuttgart, Germany: Hippokrates; 1972.
4. Lewit K. The needle effect in the relief of myofascial pain. *Pain* 1983;6:83.
5. Lewit K. *Manipulative therapy in rehabilitation of the locomotor system*. 3rd ed. Oxford, United Kingdom: Butterworth-Heinemann; 1999.
6. Gattermann MI. *Foundations of chiropractic: subluxation*. St. Louis: Mosby; 1995. p. 92.
7. Ward RC. *Foundations for osteopathic medicine*. Baltimore: Williams and Wilkins; 1977. p. 1128.
8. Lewit K, Liebenson C. Palpation—problems and implication. *J Manipulative Physiol Ther* 1993;16:586-90.