Abstract: Soft tissues follow every movement of bones and joints. Their free movement is essential for normal functioning of the motor system. Scars form mainly in the soft tissues, and if abnormal, or ‘active’, can interfere with the function of the motor system as well. For diagnosis and treatment the barrier phenomenon is a most useful concept: a pathological barrier restricts movement and does not spring when engaged. After engaging the barrier and waiting, relief and normal mobility are obtained. An illustrative case with an active appendectomy scar is presented, with both low back and abdominal pain. Extensive and costly examination were all negative. After diagnosis and treatment of the active scar symptoms were promptly relieved. Diagnosis and treatment of active scars should become part of the physical therapist’s approach to the patient’s problems.

INTRODUCTION

The role of soft tissues is largely under-rated by practitioners who treat the locomotor system. It is often not fully appreciated that whenever we move our trunk or the extremities, it is not only muscles, bones and joints that move. Movement of all the soft tissues occurs. Skin, fascia, ligaments and tendons have to move in harmony, i.e. all these structures have to stretch and to shift against one another. These movements are frequently overlooked, but they could be seen to be essential for the normal function of muscles and joints.

Scars are most frequently situated in the soft tissues. If a scar is dysfunctional, it may interfere with the elasticity and shifting movement of all soft tissue layers. The clinical picture of such a scar is similar to that of other soft tissue lesions: at the surface we palpate increased skin drag (due to moisture-sweating) and the skin does not stretch normally as compared to the healthy side (Fig.1). The skin fold associated with a scar is thicker and tender when pinched, and is not as extensible (Fig.2). Flat scars do not move freely against the underlying bone. After abdominal surgery, scars may even cause palpable resistance in the abdominal cavity and this must be distinguished from signs of possible visceral disease.

A CASE OF A PATHOGENIC ACTIVE SCAR

Alena Kobesova M.D.*
Professor Karel Lewit M.D., DrSc.†

* 150 00 Praha 5, Velka Chuchle, k Vapence 432/16
Czech Republic. Tel. 00420/2/57941277
† 252 29 Dobrichovice, Ruska 360, Czech Republic.
Tel. 00420/2/9911950
Rehabilitation Clinic, 2nd Medical Faculty, Charles
University, Prague, Czech Republic

Resistances in the abdominal cavity and this must be distinguished from signs of possible visceral disease.

The diagnosis of an active or symptomatic scar is, however, only the first step. The second is to assess its relevance, for even a symptomatic scar may not be relevant to the patient’s problem. Its relevance can be only tested by the effect treatment of the scar has on the clinical condition.

According to our theory of diagnosis and manual treatment, the barrier phenomenon is most important. Whether we stretch or shift during diagnosis, there is always a free range in which we meet practically no resistance. In our definition the barrier is reached (engaged) at the point when initial slight resistance is felt. This definition implies that the barrier is soft, it easily gives and can be ‘sprung’. It is thus examined by a very gentle movement, which is stopped at this barrier, then after a short pause springs it. If this physiological barrier is altered (pathological) it restricts the free range and once it is engaged, it springs very little. In delivering treatment, we engage the (pathological) barrier and then wait: after a short delay release takes place until the normal (physiological) barrier is restored (Fig.3).
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KOBESOVA / LEWIT

Case History

Patient P.A., born in 1951, male, electrician, manager of a firm, married, non smoker. As a child he suffered from recurrent streptococcal tonsillitis and chronic appendicitis which was operated on in 1984. In 1997 he was treated for gastro-duodenal ulcer with positive heliobacter pylori, which resolved with antibiotics. Since 1976 he has occasionally experienced some low back pain which resolved without any treatment.

The condition for which he was treated in our rehabilitation department began in 1995 with pain in his right lower abdomen. He was repeatedly examined, but no pathology was found. After playing golf on April 4th 1999 he experienced excruciating pain the following day. Pain in the right lower abdomen and the waist radiated into the right groin, testicle and to the anterior aspect of the right thigh. The patient was completely immobilised.

He was first examined at the urological department where renal colic was excluded. On April 6th he was hospitalised at the neurological clinic of the medical faculty in Prague, Motol. There, in addition to neurological examination, a number of laboratory tests were carried out (Table).

| Examination                          | Result                        |
|-------------------------------------|-------------------------------|
| Complete blood and urine examination| Negative                      |
| Cerebrospinal fluid examination     | Negative                      |
| Ophthalmological examination        | Negative                      |
| Physical internal examination       | Conclusion: recurrent abdominal colic of unclear origin |
| Radiographic examination of the lumbar spine | Degenerative spondylosis with osteophytes on the ventral aspect, most prominent at L1 and L2 with narrowing and chondrosis of the L1/2 disc.  |
| MRI of the thoracic and lumbar spine| Slight disc protrusion at T9 level |
| CT Scan of the abdominal cavity     | Small cyst in the right hepatic lobe, slight liver steatosis |
| Urological examination              | Normal                        |
| Excretory urography                 | Normal excretory renal function |
| Psychological examination           | Normal excretory renal function |

Physical examination revealed antalgic posture and gait, slight scoliosis, pain in the thoracolumbar region with spasm in the back and the iliopsoas muscles. Neurological findings included right sided dysesthesia at the L1 nerve root level. A working diagnosis was made of nerve root irritation of L1 on the right.

The only treatment the patient received at the neurological clinic consisted of medication. Orally the patient had been prescribed Indometacinum, Tramadol, Metamizolum, Pitofenoni + Fenpiverinumen, Pthidini hydrochloridum, Amitryptilin, Carbamazepinum. The patient had also been administered intravenously natrium salicylate, guafenesinum, Trimecaini hydrochloridum. All of these medications appeared to have next to no effect.

After all these lengthy (and costly) examinations and frustrating treatment the patient was sent to our rehabilitation clinic on September 9, 1999.

At examination we found antalgic posture with the trunk in anteflexion with pelvic shift to the left (trunk deviation to the right). The patient took his weight off the right leg when walking. Extension produced immediate pain in the low back and at the groin. Springing the lumbar spine with the patient lying on his side revealed painful movement restriction at the L5/S1 segment.

In addition we found an unusually symptomatic appendectomy scar. There was erythema surrounding the scar which was tender even on gentle palpation, and skin drag due to moisture. The skin resisted stretching and there was hyperaesthesia with allodynia. A pathological barrier was found not only at the superficial layers but also in the subcutaneous tissues mainly at both ends of the scar. In addition deep palpation was painful with resistance felt in the abdominal cavity.

Treatment began with gentle skin stretching which was painful at first, but after a few seconds release was obtained followed by relief of pain. After this we obtained release in the deeper layers of the scar, including fascia and muscle, in a similar manner by engaging the barrier in each layer with minimum force, then waiting at the barrier until full release was obtained. The patient felt pain at the very start, but it soon gave way to relief. The entire treatment took about 10 minutes.

Immediately after treatment the pain in the lower abdomen, in the groin and the low back had disappeared. The patient was able to straighten up and to walk normally. The restriction on palpation at L5/S1 was gone. The day after, on September 23, the patient was discharged from hospital. Due to residual pain in his lower abdomen he visited our clinic at regular intervals until October 29th, attending 7 times in total. The scar was treated by application of hot packs followed by manual soft tissue treatment. In addition, stretching and mobilisation of the dorsal fascia and mobilisation of the lumbar spine was applied. The patient was taught how to treat both the lumbar spine and the scar himself by self-mobilisation and by stroking the scar.

DISCUSSION

This 49 year old male patient was hospitalised in the neurological clinic for severe pain in his right lower abdomen, groin and low back. After exhaustive medical, surgical, x-ray and laboratory examination he was sent to...
the rehabilitation department where the apparent cause of his symptoms, an active appendectomy scar, was revealed.

Scars as a frequent cause of otherwise unexplained symptoms were first described by Huneke (1), and later by Dosch (2) and Gross (3) in Germany. The proposed treatment was Novocaine anaesthesia. Some acupuncturists applied dry needling, as did one of the authors of this paper (4). Only after learning the diagnosis of soft tissue lesions with the characteristic barrier phenomenon and its changes, did we realise that the same diagnostic criteria may also be applied to scars, which are also connective tissue structures (5). It is therefore no coincidence that the same therapeutic procedures suitable for scars can also be applied to soft tissue lesions and vice versa.

It is therefore understandable that if soft tissue lesions, particularly of fascia, can cause motor dysfunction, this can also be the case with scars. In our patient this diagnosis was particularly striking, as the scar was so obviously painful, with visible erythema. This is not usually so evident, and as with other soft tissue lesions the significance of a scar may only be revealed by palpatory diagnosis. Our patient’s symptoms are easily explained: the tender appendectomy scar is stretched by extension and left side bending and relieved by anteflexion and right trunk deviation. This may explain why the patient adopted a reflex relief (antalgic) position, although lumbar spine involvement may be responsible for this posture.

There is always the crucial problem of differential diagnosis requiring exclusion of serious pathological conditions. However, we should also reduce wasteful, costly and frequently unpleasant diagnostic procedures to a reasonable minimum.

It is therefore important to make the diagnosis of an active (symptomatic) scar, then to treat it before giving treatment to any other diagnosed lesion - segmental movement restriction, myofascial trigger points etc., and to assess the effect of this treatment on the patient’s condition. Only in this way can we establish the relevance of the (active) scar. If the response is positive and the condition of the patient improves, we have to follow up the effect. If the improvement is permanent, we may desist from further examinations. Differential diagnosis is particularly important if the painful resistance can be felt in deep structures, for example in the abdominal cavity. There is, however, an important diagnostic criterion: if resistance is due to a scar, we can sense release after engaging the barrier, i.e. the resistance ‘melts away’ under the palpating fingers, if we wait at the barrier. This is never the case in a pathological condition, and then clinical follow up is mandatory.

The diagnostic criteria for an ‘active scar’ are:

1. Movement restriction of the skin and soft tissues in the vicinity of the scar
2. A hyperalgesic zone
3. Resistance against distraction and shifting
4. Tenderness on palpation
5. Resistance in the deeper layers.

Once the diagnosis of such a scar is established the scar should be treated. Manual therapy of scars consists of stretching the skin and the subcutaneous tissues and gentle pressure of deep structures where a tissue fold can neither be formed nor stretched. Large flat scars adhering to the bone are treated like fascia. In addition hot packs may be used and the patient is taught self treatment.

It is most important to start the patient’s treatment by treating the scar first and thus assess the effect on the patient’s condition. If the effect is dramatic we may desist from unnecessary and costly diagnostic and therapeutic procedures. Manual treatment of such scars is non-invasive, almost painless and without little risk or side effects.

CONCLUSION

Diagnosis of active scars should be part of our routine management of painful conditions of the locomotor system. This is mandatory if there is frequent recurrence of symptoms not otherwise explained, if the clinical findings do not sufficiently explain the patient’s symptoms or if the patient’s complaint begins, or significantly deteriorates, when the scar is formed.

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