SOFT TISSUE MANIPULATION

Adhesions generally form as a result of the body's nonspecific attempt to ***heal*** a soft tissue injury with a prolonged inflammation process. However, when soft tissues are exposed to the "burning" effects of prostaglandins (an integral part of the inflammation process) for too long, the body will flood the area with collagen. This collagen appears in the form of fibrils (strands of collagen), designed to form a scar matrix "to heal the burn". Since there is no real burn to heal and no scar matrix to form, the little collagen fibrils start "sticking" tissue layers together instead (a process sometimes termed fibrosis). This becomes a problem because the tissue layers that are supposed to slide past one another no longer can. The tissues then "pull" against one another causing further stress and pain, extending and possibly spreading the inflammation process.

Indeed, this is the source of most of the chronic painful conditions seen in the physical medicine, orthopedic, chiropractic, and rheumatologic fields. These conditions become chronic because most are unaware of the existence of the adhesion problem and, quite understandably, fail to effectively treat the condition. These fields continue to successfully treat many of the attending symptoms, often providing temporary relief (especially with pain), but until the adhesions are broken, no real "cure" will be produced. This makes soft tissue manipulation an invaluable technique. Once adhesions are broken the tissues have a chance to return to normal, especially if the inflammation process has also been simultaneously relieved, thus preventing the reformation of the adhesions and ending the vicious cycle.

Soft tissue manipulation is defined as the manual manipulation of the soft tissues of the body for the purposes of breaking adhesions. There are two basic types of adhesion breaking techniques:

(1) Probing and shearing

(2) Rolling

In the first technique an intense deeply ***probing*** pressure should be used. The point of contact varies in width, depending on which fingers are used and how many. The ***probing*** is performed by forcefully inserting the finger or fingers into the patient's subsurface tissues and then "shoveling" with the fingertips, creating a ***shearing*** force that will break the adhesions by separating the tissues from one another.

This technique is often painful because of the high degree of pressure required to break the adhesion formations, and because the manipulated tissues have generally been sensitized by the inflammation process (an effect of the bradykinin). To minimize the pain, pressures should be increased gradually and contact with the skin's surface should be kept as broad as possible.

Rolling, the second technique, involves lifting the tissues between the fingertips and thumb, forming a dome of tissue. The dome should then be rolled between the thumb and fingers forcing the dome to a point or ridge, thereby producing a sub dermal shearing force sufficient to break the adhesions. Initially, the shearing force is exerted one to three cm. below the apex of the tissue-roll dome and travels toward the apex of the dome as it is minimized. When successfully applied, the practitioner should feel a "popping" or "crunching" sensation with the fingertips as the adhesions break. Sometimes the "popping" or "crunching" may actually be audible and quite loud (these effects also occur when the probing technique is utilized). These techniques must be adapted and modified as the types of tissues vary. Adhesions, which form within the larger structure of the musculature, exist between the fascial layers surrounding each muscle fiber bundle. These adhesions interfere with the natural expansion of the muscle as it contracts, sometimes prohibiting full contraction and producing pain. The focus of treatment should be on separating the fascial layers surrounding the involved muscles. This is accomplished by inserting the fingers between the muscle bundles (as much as is feasible) and using deep transverse friction to broaden the muscle and force the muscle bundles apart, thus allowing free movement of individual muscle bundles.

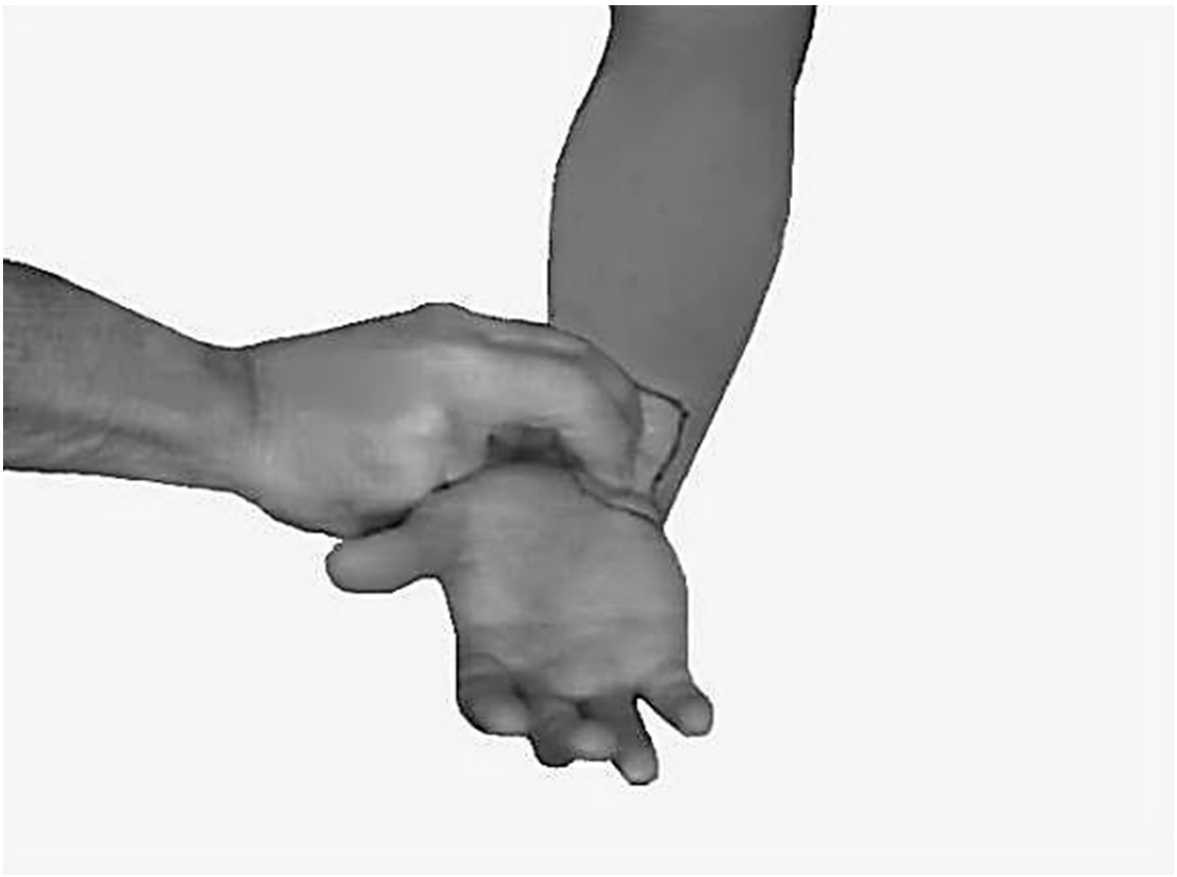
Ligaments typically link two bones and allow hinged motion of the joint they cross. Therefore, they too possess a range of motion over the bone at right angles to the long axis. This range of motion may be lost if posttraumatic adhesions have formed. To regain this motion, the ligaments should be manually moved over the involved bone or joint, both following the pathway of its normal movement

and at right angles to it. Likewise, the skin over the ligament must be probed and any adhesions broken to restore normal motion and eliminate the pain common to this condition.

Superficial adhesions occurring between the skin, muscle and tendon layers and are associated with prolonged inflammation of deeper tissues. They may be found by lifting the skin in a broad pinch. When pinched, the skin over the adhesion site will be difficult to pick up and separate from underlying muscle layers.

Likewise, when a broad pinch is finally achieved, the affected skin is generally thickened and will produce a snapping or crinkling sensation under the manipulating fingertips when rolled. It should be noted that abnormal thickening of the skin may exist simply as a collagen build up, without appreciable adhesion to other structures, as in the “dowager hump.” These conditions can be successfully treated with soft tissue manipulation and greatly reduced, especially in combination with ultrasound, at the appropriate amplitude.

In areas that are normally difficult to "pinch", especially over the backbone, shin, foot and palm of the hand, a technique similar to that used for fascial adhesions between muscle bundles, described



Fingertip “probing” to break adhesions within the Carpal Tunnel using the *Probing and Shearing Technique*

Deep soft tissue manipulation to break adhesions present in the region of the Piriformis Muscle using the *Rolling Technique*

Rolling to break sub dermal adhesions in the forearm as a partial treatment of Tennis Elbow

above, should be used (refer to Soft Tissue Manipulation in Tight Areas).

Simply lifting the dermal layers in a broad pinch and rolling the tissues between the fingers until free from the muscle layers or well softened may relieve most superficial adhesions. This procedure should continue until the snapping and crinkling has disappeared. It may be initially painful, but the pain lessens as the adhesions break up. It should be noted that some adhesions between the skin and muscle layers may be so well developed that they will not break. In such cases, one must resort to stretching to restore some mobility.

Tendons that may be affected by adhesions are most commonly (though not always) those that have synovial sheaths associated with them. When an adhesion forms, it is usually said to be between the inner surface of the synovial sheath and the tendon itself, inhibiting the free movement of the tendon and possibly creating a considerable amount of pain. Such adhesion formations are generally thought to occur as a result of tenosynovitis (inflammation of the synovial sheath).

Putting the tendon on stretch creates an immobile base against which the fingers can move the tendon sheath. This may be useful for relieving tendinous adhesions. The tendon should be massaged by rolling the tendon sheath back and forth transversely against the tendon; this serves to smooth the gliding surfaces. To manipulate areas without a synovial sheath, a back and forth transverse deep tissue friction should be applied to the tendon with sufficient force to move the tendon across its bony pathway. Relief of tendon adhesions can (in many cases) generate almost immediate pain relief and restoration of function.

Precautions:

Soft tissue manipulation is contraindicated over the site of acute phlebitis, thrombophlebitis, or phlebothrombosis. Soft tissue manipulation over such a site may cause the dislodgment of a blood clot or embolus, which may proceed to lodge in various organs including the lungs, heart, or brain causing ischemia or infarction.

Soft tissue manipulation is also contraindicated for patients suffering from acute inflammatory diseases of the skin or other soft tissues, including joints or surface layers of the bone. Such conditions may be complicated or exacerbated by soft tissue manipulation. Skin with furuncles, ulcerations, or open wounds should not be manipulated.

Soft tissue manipulation is contraindicated over areas of soft tissue calcification, traumatic arthritis of knee, or over joints that suffer from infective arthritis.

SOFT TISSUE MANIPULATION IN TIGHT AREAS

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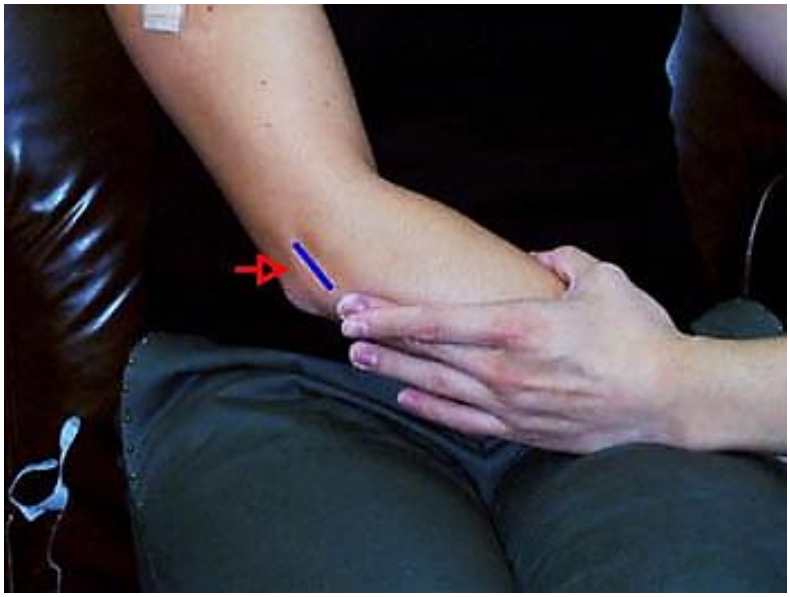
As stated earlier, soft tissue manipulation is defined as the manual manipulation of the soft tissues of the body for therapeutic purposes. For most areas in the body, the techniques described above are effective. However, their usefulness is greatest in large open soft tissue areas, and diminished in areas restricted by bones and joints, such as between vertebral transverse processes, around the AC joint, and in the joints of the elbow. Therefore, to break adhesions in these tight areas, a modification of techniques must be applied.

The key is to use the probing and shearing technique directly within the bony groove while holding the soft tissues in tension. However, getting the tissues into the correct tension can be a bit tricky, since tension must be maintained in all three dimensions.

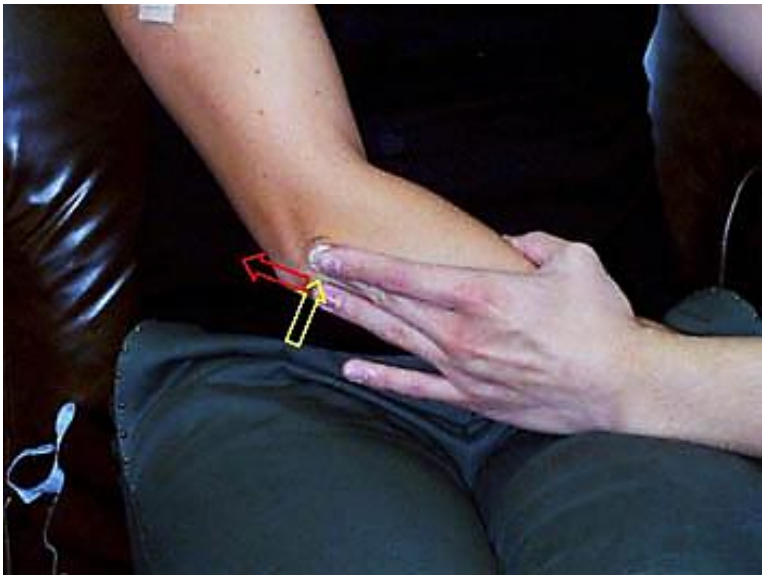
Technique

First, lay your finger (in this case the middle finger) near the area to be manipulated (in this case the radial channel). Press down to gain superior to inferior (S-I) tissue slack. Note that the starting point is actually away from the radial channel.



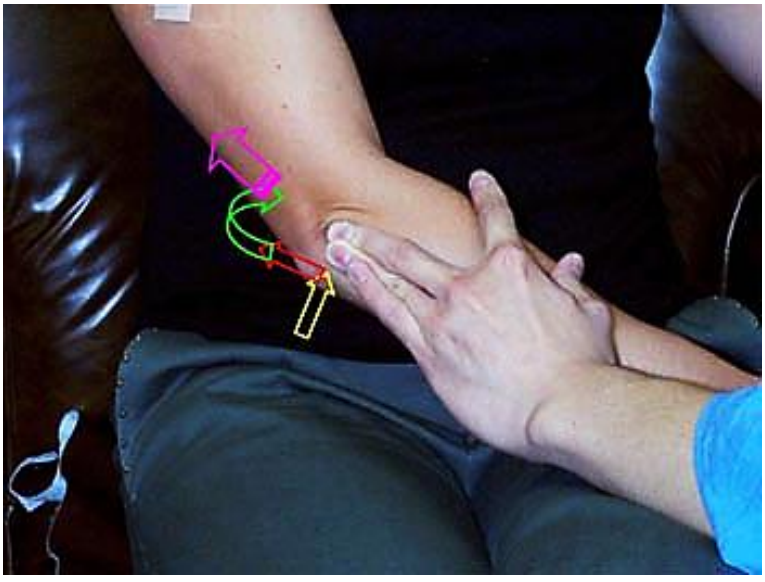
Next, holding the S-I tissue slack, move your finger medially to gain medial to lateral tissue slack (M-L),

then move your finger distal to proximal to gain tissue slack perpendicular to your first movement.

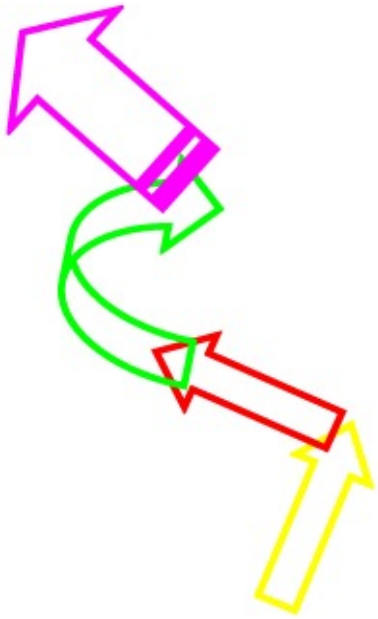


Next, I have found that by rotating your finger, you can both add tension along the outside of the finger and hold the tension well. (fourth finger side of the middle finger in the picture below)

Then finally, after all the tissue slack has been taken, and the finger is within the area to be manipulated, simply drive proximal to distal along the area to break adhesions.



Really, the exact steps taken can be interchanged as long as slack is taken in all three dimensions like the figure below.



Remember that once all the slack is taken up, the ending position will be away from the starting position, so start away from the area to be manipulated. This technique can be used on any tight bony area. The exact angles and slack will differ by area, as well as from patient to patient, but the principle remains the same.

In summary –

1. Take up tissue slack.
2. Maintain tension in all three dimensions.
3. A short drive will break adhesions if tissue slack is maintained.
4. Adjust angles to break adhesions along other planes.

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