

The principle of using an irritant to stimulate the production of nature's repair tissue (fibrous connective tissue) has been known and used for a long time. A blow will irritate tissues and produce a lump (fibrous connective tissue); a burn will produce

Basic Techniques of Sclerotherapy

Richard F. Leedy, D.O.
Woodbury, New Jersey

scar tissue (fibrous tissue); and a chemical will irritate and produce connective tissue. More than a hundred years ago hernias were treated successfully by injection of chemical irritants. Today, joint ligaments, internal hemorrhoids, and varicose veins, as well as hernias, are being treated by injection of controlled chemical irritants.

About 1937, Dr. Earl H. Gedney introduced the idea of using sclerosing injection techniques for ligaments of joints (particularly in the low back) that sprain recurrently. Ligament weakness and stretching were recognized then, as now, as principal underlying causes of joint instability that lead to recurrent sprain-subluxation. This continued sprain mechanism commonly resulted in arthritis, "slipped disk syndromes," sciatica, and other problems. Some of Dr. Gedney's co-workers began to experiment with the new treatment and gradually they developed their own techniques and skills.

The new technique has progressed slowly—but steadily. It has encountered the usual disbelief and even active opposition. About 1946, an orthopedic surgeon, Dr. George S. Hackett, began using and experimenting with the technique and, in 1956, he wrote a book titled *Joint Ligament Relaxation Treated by Fibro-Osseous Proliferation*. Dr. Gedney called the technique sclerotherapy and Dr. Hackett proposed the name prolotherapy. Today, the ligament injection of controlled chemical irritants is called sclero-

therapy in osteopathic medicine and prolotherapy in other fields. In sclerotherapy, solutions injected into a soft tissue produce hardening, thickening, and toughening—a sclerosis. The term is applied to joint ligaments and tendons only discussed in this article. In the current technique, a standard chemical irritant is injected in a well-established pattern to produce a local, predictable result with no systemic effect. Exceptions are solutions that contain washed pumice, which causes a mechanical irritation. The active principle is that of local tissue irritation to stimulate proliferation of fibrous connective tissue.

Factors of Low-Back Syndrome

All too frequently statements such as that which follows are made in relation to common symptom complexes: "The acute back syndrome is a familiar condition. It is benign, yet disabling and painful. If we are honest, then we must admit that we do not know the true mechanism or pathology of this syndrome." It would be more accurate if the writer had used the word "I" instead of "we." Similarly, one is disturbed by patients who report a previous diagnosis of "arthritis" of the lumbar spine or knee without any thought to the mechanisms that produce the arthritic degenerative changes or any hint that the changes may be secondary to a primary mechanism. It is not much different from telling a patient with head pain that he has a "headache" (cephalalgia). In my experience, there is a logical sequence that is responsible for the majority of these symptom complexes. Consider the following:

—Study of bony structure in the



lumbosacral region with the subject erect shows that the acetabulum and femoral head are located well anterior to the sacroiliac joint. Also, the sacral base carrying the fifth lumbar body plus the weight of the torso is anterior to the canted sacroiliac joint. Thus, the sacroiliac joint is a vulnerable fulcrum that is subject to a scissorlike motion by forces from above and below.

—Traumatic force from below such as stepping down from a bus or stool is transmitted directly to the first movable joint—the sacroiliac. With counterforce exerted from above by body weight, a sprain-sUBLUXATION situation inevitably results.

—Attached to the 12th rib above, and the pelvic crest and facets of L-4 and L-5 below, are the broad, flat quadratus lumborum muscles. Any force that drives the pelvis posteriorly and moves the sacroiliac joint is bound to stretch and/or jerk the quadratus lumborum. A jerk would be followed by contraction, rigidity, and a drawing up. As a result, the pelvic rim would be drawn up and tilted anteriorly. Pain and spasm of this muscle then could account for

cough pain, lumbago pain, and the reason pelvic subluxations are usually anterior in patients with low-back problems.

—Pelvic movement on the sacrum is not only anteroposterior but in a twist-bend or torsion pattern as described by Pratt.¹ This twist-bend pattern must drag or involve the lower lumbar vertebrae by means of the strong iliolumbar ligaments, producing powerful twist-bend or torsion force on the posterolateral aspect of L-4 and L-5 (where most disk extrusions are found). It seems logical to assume that pathologic disk conditions occur *after* the sacroiliac is involved.

—Although muscles move joints, they account for only a small percentage of the joint's stability. Ligaments maintain joint stability and limit motion. Thus, exercise usually is not the answer to back conditions in which ligament integrity is lost. Ligaments become weaker, not stronger, by exercise.

—It has been proven experimentally and clinically that ligaments have a profuse nerve supply and when traumatized they become stretched, and swollen and pain-

ful, affecting associated nerve pathways.

—All movable body articulations move easily with little force, if they are not restricted in any way.

Basic Concepts and Workup

The articulations of the lumbar spine and pelvis (as well as every joint in the body) are held in position and limited in motion by a heavy continuous mass of ligaments that surround the joints. In the low back, failure or insufficiency of this ligamentous structure permitting excess movement of the joints often results in a torsion mechanism; in a traumatic degree, it is the principle underlying cause of low-back problems (including sacroiliac sprain-subluxation, acute and chronic myofascitis, sciatic neuralgia, arthrosis, and disk extrusion).

Recurrent episodes of traumatic sacroiliac sprain-subluxation are leading causes of degenerative changes in arthrosis and disk degeneration leading to extrusion.

Pain, incapacity, body lists, and sciatic neuralgias, which are encountered in the acute low-back syndrome, are caused primarily by pressure of edema or effusion (inflammatory changes) as a result of the sprain-subluxation mechanism coupled with bony malpositioning. Experience has shown² that correction of the bony malpositioning and balancing of muscle tensions followed by adequate sclerosing injections into the involved ligaments corrects these abnormalities in a high percentage of patients.

In a relatively small percentage of cases, pressure of disk extrusion is the major factor in the sciatic syndrome. If it is persistent

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after the primary cause is removed or treated, probably there is a need for hospitalization and consultation.

For the purpose of this article, it is not necessary to go into detail about the basic examinations that should be done on a new patient with a structural problem for which manipulation or injections are to be used. General history, detailed history of chief complaint, blood chemistry, radiographs, and special examinations should be done.

The osteopathic physician should certainly be skilled in structural evaluation and be able to differentiate the true short leg syndrome as indicated by the erect postural radiographic technique and the apparent leg shortening of lumbopelvic structural dysfunction.

In our office, structural evaluations are done routinely with the patient prone or supine. From the supine position the entire spine may be palpated, leg length determined, knees examined, arms and shoulders evaluated, and cervical structure palpated.

From the prone position, the same areas can be observed and checked. The sacroiliac joints are tested for movement with the patient in the position for lithotomy which locks the lumbar vertebrae.

General evaluation should indicate need for neurologic testing of basic reflexes, particularly those of the lower extremities, plus measurements of the calf and thigh if there is any question of atrophy.

Radiographic help is absolutely necessary when injection methods are used, not only for successful results but for medicolegal reasons. Patient cooperation is improved by demonstrating on a viewer the defects and changes you plan to treat. Radiographs that are needed for low-back injections are: lumbar spine and the pelvic erect postural (with shoes removed). A chest film is also done. The series should be in the physician's possession permanently for study of landmarks and review as treatment progresses.

Technique

Medical practice is an art and by no means a pure science. The addition of sclerotherapy and needle techniques to osteopathic medical practice provides another skill with the probability of better results. No doubt the "art" of needle techniques as practiced by the beginner is different from that of the established sclerotherapist. Excessive postinjection reactions such as pain, fainting, and sweating, which were fairly frequent some years ago, are now almost nonexistent in our practice. This probably is because of the full confidence the patient has in the physician's ability and the manner in which the patient is handled.



Figure 1: Method of evaluation of low-back and sacroiliac mobilization.



Figure 2: Most satisfactory method of sacroiliac mobilization.

Although it is not always possible to achieve what the patient would like because of factors such as age, degenerative changes of long standing, congenital anomalies, concurrent diseases, and poor cooperation, the following management principles will help. Since the low back is by far the most common area in which ligament injections are used, it will be given major attention.

After history and physical examination have indicated a low-back structural pathologic condition

and ligament sprain and joint subluxation with possible disk involvement, the next step is to differentiate.³ If recommended injections completely or partially relieve the pain, treatment should be full sclerotherapy buildup plus other associated measures. If sciatic pain persists, further testing and investigation are indicated before radical treatment is considered. In preliminary preparation for the injection procedure, the sacroiliac articulations are first put through their range of

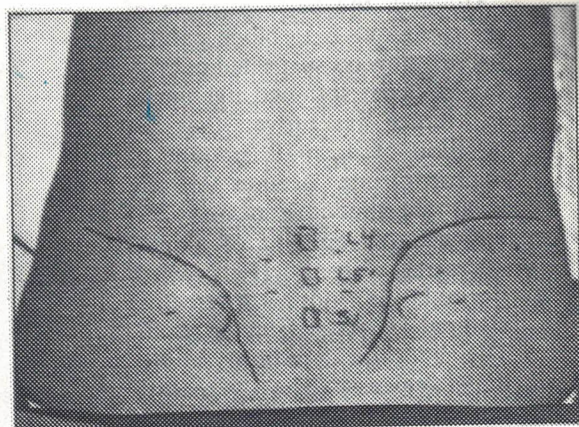


Figure 3: Necessary low-back bony landmarks.

motion (if possible). With the patient either on his side or back, the sacroiliac articulation should be manipulated gently by maneuvering the bent leg (Figs. 1 and 2). The patient is then turned over on his stomach and a small pillow is placed under his lower abdomen to flatten the lumbosacral curve. The plan of procedure must be explained to the patient and his agreement obtained. Next, the landmarks of the lower back such as the posterior superior iliac spines, spinous processes of L-3, L-4, and L-5, S-1 and S-2 vertebrae, outline of the crest of ilium, line of the lower sacroiliac area, and the probable position of sacral foramina should be marked. With experience, this marking should not be necessary every time (Fig. 3).

A Gabriel 5-cc glass syringe, which has a short stylus attached for puncturing vial caps, and a 2-in 23- to 25-gauge needle are used. Since a 25-gauge needle is thin and "whippy," a 23- or 24-gauge needle may be preferred by the beginner; this is more traumatic but less apt to "wander." With experience, a 25-gauge 2-in needle may be used routinely.

Although the basic purpose of the technique is to block painful nerve pathways suspected of originating from sprained ligaments, experience has proven that the addition of a small amount of hydrocortisone acetate to the local anesthetic (lidocaine 2%) and a small amount of a mild sclerosing agent (Farnsworth Formula 61) add a corrective element and give a better result. The lidocaine produces immediate analgesia. The hydrocortisone has an anti-inflammatory action that extends beyond the length of the action of lidocaine. The action of the sclerosing agent is delayed and prolonged, thereby stimulating the repair process (proliferation of fibroconnective tissue). A safe combination, then, would be 1 ml Formula 61, 0.5 ml hydrocortisone acetate (50 mg/ml) and 3 ml lidocaine 2%. A 5-ml syringe and a 23-, 24-, or 25-gauge needle should be used. Three to four milliliters of lidocaine alone may produce the desired results for differential diagnosis if the physician is hesitant about adding the other solutions.

For injection of the patient's left sacroiliac area, a right-handed physician stands facing the prone patient's left side. The index finger is placed on the posterior superior iliac spine; the other fingers touch the curve of the pelvic rim, with the thumb over the lower gluteal area (Fig. 4). The center of the area to be injected is thus under the index and middle fingers. The syringe is held like a lead pencil.

First Visit—The injection is begun about halfway between the posterior superior iliac spine (index finger) and L-5 spinous process (this varies). The angle is about 45° down and out (anteriorly and laterally) under the posterior superior iliac spine. The

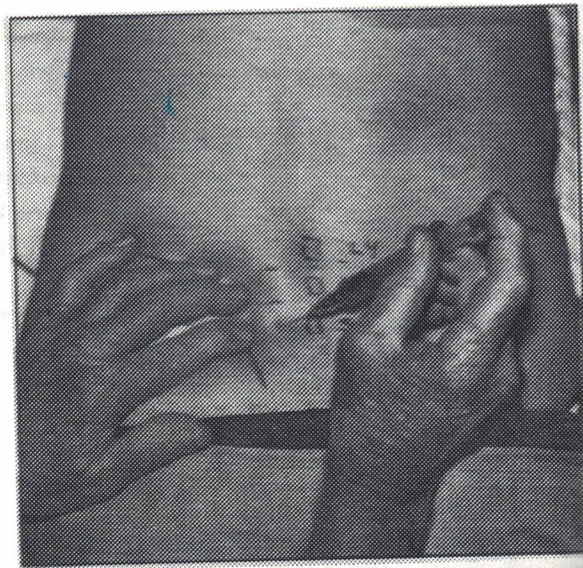


Figure 4: Midsacroiliac injection on the left side.



Figure 5: Angle down toward foot by drawing needle part way out and redirecting.

needle is passed in until bone is lightly touched and backed off slightly; the plunger is withdrawn to check for blood and an injection of 0.50 to 0.75 ml is made while the needle is being withdrawn 1/2 to 3/4 in. The solution will spread an inch or so. The needle is withdrawn until the point is just

beneath the skin; then at the same lateral angle of the needle is pointed to the sacroiliac articulation (Fig. 5). The ligaments are then injected; 0.5 ml is injected. The needle is withdrawn until the needle point is brought beneath the skin.

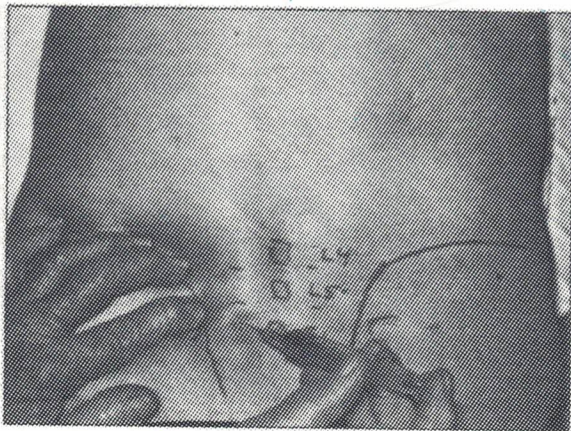


Figure 6: Angle up—using same procedure as given for Figure 5.

and injection is made 45° up under the curve of the ilium above the posterior superior iliac spine (Fig. 6). (It has been found that a 2-in needle will reach the involved area in most patients.) In the upper sacroiliac and lumbosacral areas, the ligaments are deeper and thicker, so 1 to 2 ml of the solution may be injected. Small amounts of the recommended solutions in these areas where no large arteries or nerves are normally found are quite safe.

For injection of the right sacroiliac and lumbosacral ligaments, the physician stands on the patient's right side with the index finger of the left hand resting on the posterior superior iliac spine while the thumb is along the curve of the ilium. Injection is made in the same manner.

The patient is then turned on his side, his legs are dropped off the table, and he is instructed to push himself up. He is asked to walk around the room. In a high percentage of cases, the patient will be free or relatively free of pain, thereby pinpointing the basic pathologic defect to be in

the sacroiliac and lumbosacral ligaments. Sciatic pain can often be traced to other origins. If such pain is not blocked by sacroiliac and lumbosacral injections, it still does not necessarily signify disk extrusion as the cause.

The details of this injection are given here because I think the procedure to be within the capabilities of most general practitioners. The sclerotherapy follow-up requires added supervision and study.

Sclerosing solution should not go into muscles. Muscles soon enough become fibrous as life progresses. Sclerosing solutions should only go into weak ligaments, tendons, or fascia.

Local anesthetics or steroids, or both, injected into painful spastic muscles that are probably guarding inflamed joint ligaments may break the guarding action, thus intensifying the ligament pain. To avoid this, always inject the associated joint ligaments also. I rarely inject spastic muscles. Stopping the ligament pain will do the job well. The best follow-up for this injection technique is two to three days of bed rest.

Muscle relaxing and anti-inflammatory medication should be given four times a day. In recurrent joint conditions, the standard weekly ligament buildup is given for permanent results. After the first visit, the patient is sent to be radiographed.

Second Visit—The radiographs are shown to the patient and explained. If the patient improved during the week, a good outcome is probable.

Warn patients that full-strength injections may cause different types of reaction. Generally, minor pain may be experienced for 48 hours, then there may be two to three good days, then the old pain will start to build up until the next visit. Each treatment should cause the "good" period to lengthen. Usually definite improvement is noticed in three to six visits.

If the patient is not sure if he is better or worse, I record "so-so." If the patient reports a good week, the second injection is usually 2 ml Formula 61 plus 2 ml lidocaine: $\frac{2}{3}$ in bad low-back area ligaments and $\frac{1}{3}$ in good ligaments. If the previous week was painful, the first injection is repeated or a weaker combination is used.

The patient's activity must be controlled. Bed rest for patients with an acute back problem for a period of two or three days after injection is necessary, but not often. After three to four injections a better understanding is reached.

Third Visit—If the last injection was well tolerated, I use (same solution) 2 ml Formula 61 and 2 ml lidocaine: $\frac{2}{3}$ on the bad side and $\frac{1}{3}$ on the good side. Injections are always preceded by osteopathic manipulative therapy as indicated.

Fourth Visit—The patient is questioned in regard to progress.

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If progress is according to plan and solutions are well tolerated, the fourth injection consists of 1 ml quinine urea-HCl and 3 ml lidocaine: $\frac{2}{3}$ on the weak side and $\frac{1}{3}$ on the strong side.

Fifth Visit—On this visit the standard injections are given (1 ml quinine urea and 3 ml lidocaine). Also, lifts indicated by radiographs should have been completed. Laboratory work should be completed and abnormal conditions treated. Medication should be adjusted to the patient's needs as experience in the first four visits dictates. By this time, muscle spasm or inflammatory changes, or both, are usually gone so relaxants and steroids are not needed. Mild apprehension or moderate pain may have to be treated.

Sixth Visit—Begin injecting interspinous ligaments or facets, or both, as indicated, usually in addition to sacroiliac and ilio-lumbar injections. Indications for interspinous ligament sclerotherapy are pain on pressure, soft edematous feel, and recurrent sprain-subluxations (instability). Usually, interspinous ligaments require only three to five injections.

Indications for injecting facet articulations are radiographic evidence of degenerative changes (facet syndrome), abnormal facing of facets (sagittal), and instability. Facets usually injected are L-4 and L-5, although sometimes L-1 through L-4 need treatment. (The aftereffects of interspinous ligament injections are more painful.)

A typical sixth injection would be 1 ml QU urea plus 3 ml lidocaine, 0.75 ml to L-4 interspinous to 0.75 ml L-5 interspinous (2.5 ml into originally weak sacroiliac); treatment to a "good" sacroiliac is omitted (Fig. 7).

Seventh Visit—Ligament injec-

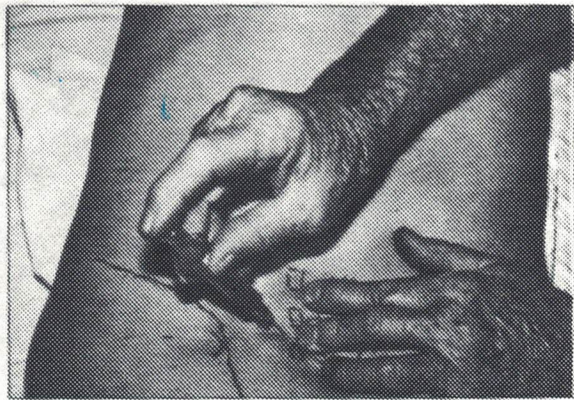


Figure 7: Interspinous—approach slightly from side (may be straight down).

tion and an exercise or stretching instruction sheet are given to the patient after a demonstration. Exercise is not a cure all. In instances where arthrosis and hypermobility are present with joint weakness and degeneration, exercise is harmful. In long-standing degenerated low backs, the patient should never do twist-bend types of movement; however, there are safe and efficient movements.

Back muscles in long-standing low-back conditions are usually spastic and hypertrophic on one side and atrophic on the other. Because we think leg weakness as a result of inactivity is the cause of many repeated falls, particularly in the elderly, we advise stretching and exercising.

Most patients with low-back problems do not need and should not do strenuous exercises that further irritate already weak and aching joints. The involved muscles already have excessive fibrous connective tissue in proportion to healthy contractile muscle. Strenuous exercise will only produce more connective tissue. What is needed is muscle conditioning by mild use such as

walking and stretching. Therefore, about the seventh visit when the injected articulations are becoming stronger and more stable, these activities should be begun.

Stretching—Lie on the back with feet flat on the table or bed, knees up. Bring knees to chest while wrapping arms around legs, curl up, count to 15. Gently increase tension while concentrating on "letting back muscles go." Always do both legs together, never singly. Do this four or five times, four or more times a day, increase as it becomes easier.

The same stretch can be done by standing with feet apart. Bend knees and lean forward, hands on knees. Extend hands and arms toward floor until low-back stretch is felt; keep knees only slightly bent and increase stretch for eight to ten seconds. Replace hands on knees and push trunk to standing position. Do this four or five times, four or five times a day.

Exercising—In older, inactive or obese patients with low-back problems important groups of muscles are often in need of activity. I recommend these exercises.

—Partial knee bends: bend slightly forward, hands on knees, and do partial knee bends ten times (no more than ten times) four times a day and increase as thigh and leg muscles improve.

—Lie on back, knees up and hands on back of neck, lift head and upper spine four to ten times. Repeat three to four times daily. This is a safe abdominal exercise; it does not harm the back and can be done by almost everyone. Walking, swimming, and bicycling also are excellent methods for body conditioning and are usually possible for patients with low-back problems.

—Isometrics: This method of contracting and relaxing muscles regularly and rhythmically can be done anywhere and anytime by anybody.

—Deep breathing: I recommend deep breathing for a minute or so four to five times daily (for older people especially).

Low-back problems frequently are associated with well-defined muscle and fascial symptom complexes. The two most common are tension of the piriform and gemelli muscles and contraction of the gluteal and tensor muscles of the fascia lata. The following stretching techniques have proven effective in treatment.

—Piriform and gemelli stretching: Lie on back, legs straight; rotate one foot and leg inwardly while the other foot is rested on it, thereby applying the pressure of its weight. Hold for 15 to 20 seconds. Release and repeat four to five times, four times a day. The same stretching can be done while sitting, legs on a stool.

—Gluteal stretch: Lie on back, bring one knee up and over the other leg. Apply pressure by hand on the knee for 12 to 15 seconds to stretch the gluteal muscles in varying directions. With one knee up, the foot a little to the outside,

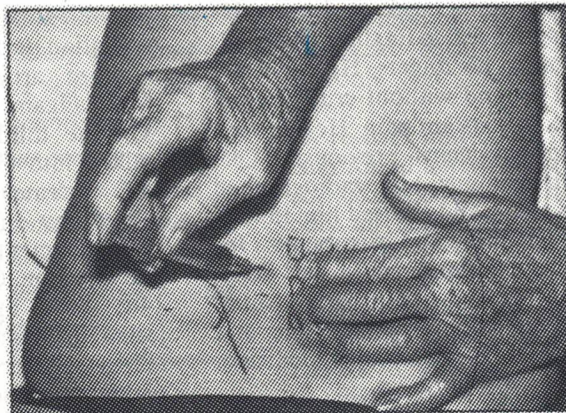


Figure 8: Left L-4 facets (study radiographs)—this joint is not deep.

allow knee to fall inward. Rest other leg on the bent leg; its weight produces a powerful stretch. Hold for 15 to 20 seconds. Repeat three to four times, three or four times a day.

Eighth to Twelfth Visits—The standard solutions are used weekly as before to build ligament strength to firm “needle feel” throughout the affected ligaments. Needle feel is the criterion for a safe and satisfactory degree of ligament proliferation. This may not be acquired easily, but at about the eighth injection, resistance should be felt to the needle as further injections are given. We begin to lengthen the time between visits when a fairly firm resistance is felt to the needle; sometimes this occurs at 6 to 8 visits, often at 10 to 12, and less often at 12 to 20. Patients are usually symptomfree at five to six injections, but if needle feel is unsatisfactory I continue weekly to ten or more injections. I then have patients return in two to four weeks (one visit), then monthly for as many months as are necessary to secure firm needle feel, then three months,

and finally for six-month booster injections.

The booster injections usually consist of 1 ml QU plus 3 ml lidocaine in both sacroiliac and lumbosacral areas; high, low, deep, and shallow plus lumbar interspinal region, and facets as needed (Fig. 8). Booster injections are very important. After the patient is symptomfree, a recall notice should be sent for regular rechecks and boosters. In some instances, regular booster injections are necessary indefinitely.

Case Histories

Case 1—A 73-year-old man came to our office in 1968 on crutches. He had recently been retired from his work as a heavy construction electrician. His health had been good except for minor aches and pains in his back periodically until approximately six months ago. At that time, “something happened to his low back.” It came on suddenly; one side was affected first with severe, crippling pain that did not radiate down his legs, but stiffened his

whole spine, neck, and arms. He experienced a tingling down his arms to his fingers. He could not get around without crutches and was in constant pain. He had seen two physicians previously. One had examined him, radiographed his spine, and advised him that he had arthritis and osteoporosis for which nothing could be done. The second hospitalized him, recognized low-back trouble, and advised a brace and medicine, which did not help.

This man was discouraged and anxious. He admitted he did not care to go on living in his present condition. He was also suspicious that the other doctors may be wrong—the problems had come on too suddenly.

On examination, the patient's general health seemed good; blood pressure, weight, general appearance, and reflexes were normal. Structurally, his entire back musculature was rigid and splinted; both sacroiliac joint ligament regions were extremely sensitive to deep pressure. Bony landmarks were altered; that is, internal malleoli were uneven and anterior and posterior iliac spines were unequal—a typical "pelvic twist" picture. Radiographic examination of the lumbar spine and pelvic erect postural radiographs showed arthrosis, osteoporosis, and disk degeneration.

The diagnosis was pelvic twist with sacroiliac sprain-subluxation, muscle splinting, and ligament deficiency. Treatment followed the usual plan detailed herein. On the first visit, hydrocortisone, lidocaine, and Formula 61 were injected into both ilio-lumbar and sacroiliac joint ligaments. Medicine and two days of bed rest were prescribed. On the second visit, the patient's condition was improved considerably; he came to the office using a

cane. Treatment consisted of manipulation to relax muscles and mobilize articulations followed by intraligamentous injections.

On the third visit the patient walked into the office without a cane or crutches. He drove himself to the office for the fourth visit; treatment was manipulation and injection. On the 5th through 14th visits, ligaments were injected throughout the low back. All symptoms disappeared. The patient was discharged and asked to come back for regular booster injections, which he did not do. A telephone check five years later indicated no recurrence.

Case 2—A 47-year-old man was referred to our office for a nagging backache that had begun about three years ago. It began as vague stomach distress, moved gradually up to the right upper part of the abdomen then to the right lower part, and finally settled in the lower right side of the back and groin. The pain did not follow a sciatic pattern. The entire spine became stiff and painful. He had seen an osteopathic physician in the early stages; this physician ordered a gastrointestinal study but had no

other suggestions. His next doctor was an MD who recognized the possibility of a structural problem and had the patient hospitalized for tests and radiographic studies (negative). His treatment consisted of hot baths, exercises, and medication, which did not help much.

The patient seemed to be extremely apprehensive and depressed and had lost 23 lb in the past year. His appetite was poor; he was tired all the time, and he was so irritable that he upset the whole family. He could not work as a salesman and was becoming desperate. His only relief came from lying down. On examination, a trigger area of pain and sensitivity was found to be his right sacroiliac articulation; there was associated hypersensitivity of the right inguinal ligament and the dorsolumbar spinal musculature. When tested for motion, the right side was definitely hypermobile. Radiographs showed a right-sided deficiency of 0.5 in plus motion and arthrosis of the lumbar area.

The diagnosis was unstable current sprain-subluxating of the sacroiliac articulation as a result



of ligament insufficiency and short leg. An important treatment factor was reassurance. The patient had been told what he did not have, but no one had explained his symptoms or told him what he did have. He was convinced that he had cancer or a hidden disease. When the causes and effects and the probable result of ligament rebuilding by sclerosing injections were explained, his attitude changed immediately.

Treatment followed the plan given in this article; response was immediate. He had the usual course of 12 to 13 weekly treatments and regular boosters to the present time (every six months). On a recheck five years later, he was 100% symptomfree and working normally.

Case 3—An attractive 60-year-old woman was referred to our office with severe pain in the right lower rib area that radiated to her back and solar plexus. The pain began about ten years previously and was becoming increasingly severe. It now involved her entire spine. In the past two years, there had been episodes of nausea and vomiting, loose bowels, and fainting. She had been hospitalized twice, once for complete workup by an internist who diagnosed diverticulitis and colitis. She felt better after rest and hospitalization. Symptoms built up again when she returned to her work as a housewife and bookkeeper. Her next hospitalization was with an orthopedic group; an extensive three-week evaluation included a rib biopsy at the site of greatest pain. Nothing pathologic was found, so she was advised to seek psychiatric help and wear a brace. She was unable to wear the brace and was indignant in regard to the psychiatric advice.

Examination followed the usual plan of structural evaluation with

Patients are usually symptomfree after five or six injections, but if needle feel is unsatisfactory it is wise to continue weekly injections for ten or more visits. Patients' conditions are then evaluated biweekly, monthly, every three months, and finally at six months for booster injections.

the help of erect postural radiographs. The dorsal spine musculature was hypertrophic and spastic on one side and atrophic on the other; a trigger area of myofascitis was present in the middorsal spine at the head of the painful rib. The diagnosis was intercostal neuralgia resulting from lumbopelvic imbalance, severe scoliosis, and ligament failure complicated by neuromuscular depletion and short leg.

The patient was shown the radiographs and the sequence of her trouble was explained. Treatment followed the customary plan of mobilization of all spinal segments; sclerosing solution was injected into badly deteriorated low-back ligaments, and later into interspinal middorsal ligaments. Lifts were advised for the short leg beginning with $\frac{1}{4}$ in and going to $\frac{1}{2}$ in then $\frac{3}{8}$ in. She was advised to cut her work schedule in half for several months. Reassurance was necessary at each visit since she had been thoroughly discouraged. Limited improvement was immediate. Then progress was slow but steady for

several months. After that time, she went back to a full-time schedule that slowed the recovery.

A recheck and booster injection later found her working full time and taking care of her home with only an occasional twinge as a reminder.

Application of sclerotherapy to specific problems will be discussed in another article to be published in a future issue of *Osteopathic Medicine*.

Addendum

Since this article was written, Formula 61 (Farnsworth and Co., Hebron, Ill) is no longer available. This formula was mild, and it was mostly used for small joints and beginning injection dosages. However, satisfactory substitutions can be made. We recommend that instead of 1 ml of Formula 61, the physician should use 0.5 ml of Hackett's solution (Chase Pharmacy, Baltimore, Md), 0.5 ml of QU (Farnsworth), or 0.33 ml of sodium morrhuate.

The total volume given at each injection site should remain the same as the volume used in the text. []

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