

In any body joint where ligaments are inadequate, soft, painful, and edematous (thereby permitting joint instability with resultant sprain-subluxation mechanism), the injection of sclerosing solutions is indicated. Some specific instances are as follows.

Applications of Sclerotherapy to Specific Problems

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—Suboccipital tendo-fibrositis producing tension headaches often responds dramatically to injections of combined solutions into the weak and painful muscle attachments.

—Shoulder girdle and elbow problems are frequently a result of ligament failure, and respond well to injection therapy.

—Recurrent cervicodorsal osteopathic spinal lesions, which often are due to loss of interspinous ligament strength, respond to interspinous ligament injections.

—Whiplash is frequently prolonged by ligament injury and insufficiency that responds to sclerotherapy.

—The low-back symptom complex is probably the most important and rewarding area in which sclerosing techniques are indicated.

—Knee problems, instability, and arthritic degenerative changes respond to sclerotherapy.

In the elderly, the acute or recurrent sacroiliac sprain-subluxation mechanism that cripples and incapacitates contributing to general deterioration and frequently early demise has responded dramatically to osteopathic evaluation and joint ligament sclerotherapy.

Swollen, painful, crippling arthritic knees, especially in the elderly, respond to the technique given herein and for which patients are most grateful. Degenerative changes are of course irreversible, but the periarticular pain and distress are relieved. Most frequently this situation is

found to involve one knee more than the other, and to have a direct relationship to a low-back problem.

Interspinous Ligament Sclerotherapy

The importance of strengthening supraspinous and interspinous ligaments by the injection of sclerosing solutions to improve joint stability and stop or reduce the frequency of "lesioning," as known in osteopathic medicine, is steadily gaining recognition.

Indications for this therapy are signs and symptoms of ligament inadequacy or failure, as in the recurrent sprain-subluxation mechanism found in the osteopathic vertebral lesion, persistent whiplash aftereffects, intercostal neuralgia, and radicular syndromes.

Before intervertebral injections are begun in other areas of the spine, it is important to repeat that the lumbopelvic area should be evaluated and normalized as much as possible by manipulation, lifts, and sclerotherapy.

Before injection, the paravertebral soft tissue should be treated by short, specific manipulation and the area mobilized by a gentle osteopathic technique.

Interspinous ligaments from C-3 through L-5 can be, and are, safely and effectively treated with injected sclerosing solutions. The most common areas in our experience are C-3 to D-10 and L-4 and L-5. Along with the patient, X-ray films and an articulated spine should be carefully studied to determine the correct angle of insertion and the approximate depth.

Interspinous Injection Techniques—At the C-6 level, needle insertion of $\frac{3}{4}$ in usually carries the needle point to the middle of

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the ligament in the average adult. From C-6 to D-4 the depth is about 1 in. In the middorsal area, the insertion should be $1\frac{1}{8}$ to $1\frac{1}{4}$ in. The needle's point must meet firm tissue resistance at all times; do not go too far.

Cervical Dorsal Injection in summary—Patient is seated on a table, his back to the physician and head bent well forward to separate spinous processes.

A mark is placed alongside the interspaces to be injected.

The doctor places his forefinger alongside the interspace opposite the mark touching both spinous processes.

Injection is made directly into the center of the interspace or slightly below center. The needle is angled up as predetermined and passed between the spinous processes to the predetermined depth. Of the volume planned for each interspace, half is deposited at about an estimated halfway point and should spread for $\frac{3}{4}$ in. The remaining half is spread along the area as the needle is slowly withdrawn. The patient will usually give a slight start as the needle passes through the supraspinous ligament into the

interspinous area. On the whole, interspinous injections are well tolerated.

Usually two to four interspinous ligaments are injected at each visit. However, it is not unusual to inject both sacroiliac articulations—three sites each and three or four interspinous ligaments at a visit in special instances.

In interspinous ligaments, the sclerosing solution usually used is 1.5 ml Farnsworth 61^a plus 1 ml lidocaine. Only 0.5 to 1 ml is used in each site. Quinine urea hydrochloride (QU)^a is used at times if a stronger solution is needed.

A series of four to six weekly injections is usually sufficient for interspinous areas to decongest, to alleviate pain, and to stabilize. The cervical and dorsal spine ligaments respond quickly. Too much treatment is not desirable. The aim should be to strengthen an area sufficiently to produce a balance with the rest of the spine.

Booster injections may be necessary later if more symptoms or signs develop.

Knee Sclerotherapy Technique

There is little in the literature about the low-back-knee syndrome or symptom complex, although most osteopathic physicians understand it. Here again, the lumbopelvic area becomes suspect as being the underlying cause of much pathology of the knee. There are many cases in our records in which the patient had a crippled knee and it was found that knee injections were unnecessary. Manipulation and/or sclerotherapy of the low back

^aFarnsworth Laboratories, Inc. Hebron, Ill.

corrected the problem. With altered low-back mechanics, such as short leg and pelvic twist, it follows that altered tension of muscles from the pelvis to the lower leg inevitably transmits altered forces, stresses, and strains. Thus, before sclerotherapy is used, the lumbopelvic area should be evaluated and abnormalities corrected by manipulation, lifts, and sclerotherapy as indicated.

Sclerotherapy treatment for knee problems is highly successful. With its questionable aftereffects in later years, one wonders how much of the current knee surgery done especially on athletes could be avoided by first using adequate osteopathic evaluation and ligament repair available in sclerotherapy procedures.

If knee injections are necessary after lumbopelvic therapy is complete, this is my choice of technique.

The best results can be achieved by spreading the chosen solution in small amounts throughout as much ligament tissue as possible. Knees are sensitive, so the smallest possible needle is used—25 gauge, 1 or 3/4 in. A mild sclerosing agent such as Formula 61 is used (1 to 2 ml plus 1 to 2 ml lidocaine), and usually nine sites are injected for internal knee ligaments at each visit from three needle insertions. The solutions are mixed and usually given together because it is less traumatic to make three rather than six or nine insertions. The anesthesia takes effect quickly and little pain is felt. The solution is spread carefully throughout the capsular, coronary, and internal collateral ligaments (Figs. 1 and 2). With the patient supine and a small pillow under the knee, the exact location of the internal knee ligament area is located by grasping

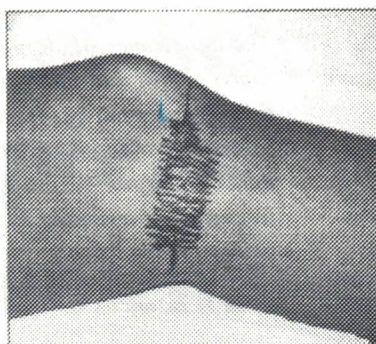


Figure 1: Area of medial involvement of left knee.

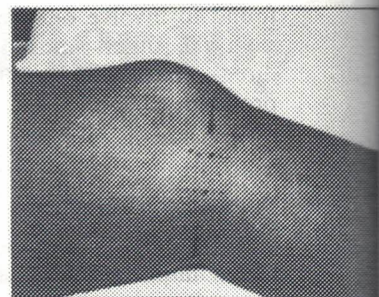


Figure 2: Three entry points; three sites each entry.

ing the knee with both hands, thumbs over the joint and moving the articulation in all directions. Horizontal marks are made indicating the tibiofemoral line. The injection is made at the anterior end of the joint by directing the needle straight into the capsule upwards to the femoral rim and down to the tibial rim. The second set of injections is made midway at the internal collateral area with three sites injected. The third injection is made at the posterior aspect of the joint. If 1.5 ml of Formula 61 and 1.5 ml lidocaine are used, the 3 ml are spread as evenly as possible at nine sites. With some practice, the procedure should not take more than 30 to 60 seconds.

This technique spreads the solution over a wide area and produces immediate pain relief plus mild fibro-osseous proliferative stimulation. Injections are given once a week four to six times, which is usually sufficient to relieve pain, decongest, and toughen the entire internal ligament area thereby producing stabilization.

Occasionally, the lateral ligaments need injections. This area is smaller and requires less solution. With good tolerance and

cooperation, both knees can be injected at the same visit.

After the basic buildup series, the knee ligaments should receive booster injections at monthly intervals to produce sufficient strength for permanent stability.

If hypermobility is evident when the knee is put through its range of motion, if full flexion and extension is possible, and if the internal ligamentous area is soft, edematous, and painful, in my opinion the knee should have the benefit of sclerotherapy regardless of evidence from X-ray films of degenerative changes as thinning of disks, arthrosis, and so on. Many damaged knees that are apparently candidates for surgery can be rendered symptomfree and fully functional with this treatment. There is no need for arthrography in these situations.

CASE 1.—A 55-year-old woman came to the office using a cane and in obvious distress. She had been under physicians' care for two years for a generalized rheumatic condition affecting her low back, knees, and feet. She had become progressively worse. She had gained 30 lb in two years and seemed to be puffy and edematous.

Examination showed generalized edema and extremely painful low-back and knee soft tissue. Blood

(from p. 81)

chemistry was normal except for a high serum uric acid value.

X-ray films did not show excessive joint degeneration in the lumbosacral and knee articulations.

The diagnosis was gouty arthritis. There was ligament insufficiency of the knees and low back—general debility.

Treatment consisted of a high-vitamin, low-purine diet regimen; gout medication; and injections of sclerosing agents plus local anesthetic and anti-inflammatory medication to lumbosacral ligaments and both knees. At each visit, all four areas were given mild injections.

Results were dramatic. The patient lost weight steadily, her knees and back became less painful at each weekly visit. After ten weeks, she was painfree and able to resume her normal life pattern. As determined by telephone recheck seven years later, the patient had no recurrence.

Upper Extremity Problems

The management of upper extremity problems must of necessity involve the cervicodorsal spine, as well as the entire arm and shoulder in examination and evaluation. This should follow taking a general history and giving a physical examination plus making complete spinal evaluation. There are three parts to management in this area: examination and treatment (physiotherapy and manipulative procedures); various types of needle techniques as indicated and complementing manipulative techniques; medication, home care, and treatment with the patient following instructions given specifically by the physician as to exercising, stretching, massage, and so on.

Examining the Patient in a Sitting Position—The upper cervicodorsal spine and shoulder are examined for paravertebral and intervertebral abnormalities such as painful trigger areas and re-

stricted range of motion (Fig. 3).

Examining the Patient in a Supine Position—This position is the easiest for the physician and the most comfortable for the patient. From this position, the hand, wrist, forearm, elbow, and shoulder can be evaluated and treated manipulatively. Upper cervicodorsal manipulation may be effectively given in this position also. The aim is to produce or reestablish full and painfree function of all tissues to the extent possible.

CASE 2.—A woman came to the office with a severe, stabbing pain in her upper left side of the chest. She was apprehensive and was unable to take a deep breath. She had had similar minor attacks before, but this attack was the most severe. On examination, she showed no cardiovascular signs or symptoms. Structurally, her dorsal spinous processes from D-2 to S-5 seemed rotated and the intervertebral and paravertebral structures were hypersensitive and "hot." Her second and third ribs were prominent anteriorly at the costosternal junction and hypersensitive.

The provisional diagnosis was intercostal neuritis; arthritis of D-2 to D-6 vertebral and ligament inadequacy.

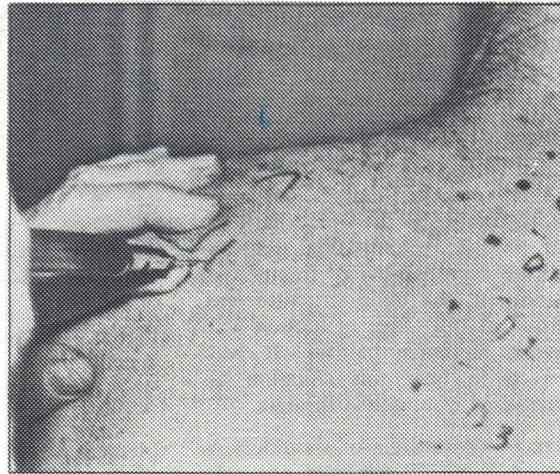


Figure 3: Painful trigger points along spine of scapula.

With the patient on her side, the chest wall was gently lifted and stretched by lifting the shoulder and arm. Then injections of cortisone, local anesthesia, and a mild proliferant were given into the interspinous ligaments of D-2, D-3, and D-4, and at the sensitive rib angles. (Anterior costosternal junction injections are rarely necessary.) This treatment gave immediate relief. It released the "catch" and pain faded promptly.

Medication in the form of prednisolone with a muscle relaxant was given four times a day—after meals and on retiring—for three days.

The patient was sent for X rays to be taken and the area of D-2 to D-6 was found to have advanced arthritic degenerative changes.

As follow-up, the patient receives booster injections into intervertebral ligaments in the arthritic dorsal area about every six months.

Injections for Shoulder and Arm Problems

In recent years with the development of injection techniques to complement osteopathic management of shoulder and arm problems, results have become much more satisfactory with much less energy expended. Typical reports

of cases follow covering the most commonly used techniques and current procedure.

CASE 3.—Arthralgia of the shoulder (subdeltoid bursitis, capsulitis)—A stocky, muscular farmer stumbled and fell on his shoulder ten days before coming to the office. History and physical examination did not indicate a probability of fracture or dislocation; the bone structure was normal. A full range of motion was present although painful. It was decided to treat this situation as generalized traumatic arthralgia.

CASE 4.—Arthralgia of shoulder—A woman about 50 years of age was sent to our office presumably for sclerotherapy by her D.O. general practitioner. She had had a hot and painful shoulder for three days. There was no history of trauma, no other painful joints, and no limitation in her range of motion. This case was diagnosed as a generalized type of arthralgia of undetermined cause possibly rheumatic or gouty.

Both patients were treated with subacromial intrabursal injections consisting of 1 ml of slow-release steroid (Aristocort Forte Parenteral) plus 1 ml of 2% lidocaine using a 1½-in. 25-gauge needle and entering posteriorly under the acromial process (Fig. 4).

Both patients were also given small doses of prednisolone four times a day plus an analgesic for four days. Both patients had immediate relief and no recurrence.

Shoulder Problems

Acute Tendo-Bursitis of the Shoulder—This condition is quite common and frequently involves the long head of the biceps, its insertion, and its tendon sheath. It usually is very painful and "hot." The most effective treatment is the direct injection of a local anesthetic into the involved area such as plus 1 ml of 2% lidocaine, 0.5 ml of hydrocortisone (20 mg), and 0.5 ml of a mild sclerosing agent as Formula 61.

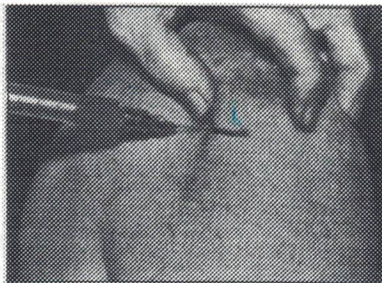


Figure 4: Subacromial intrabursal injection.

The shoulder is put at complete rest, preferably in a sling, for two to three days. Percodan to be taken four times a day can be given if necessary.

Ice packs applied to the inflamed area for 10 to 15 minutes at a time for the first 24 hours may help. After 24 hours, the shoulder usually can be put through its range of motion and its use gradually increased. After a week follow-up is needed; more sclerosing agent should be used to toughen the weakened tendon attachments. Be sure the bone is touched gently at each injection site and use small amounts of solution (0.5 ml).

CASE 5.—Painful shoulder of long duration—A 48-year-old farmer and chemical plant operator had held two jobs for several years which involved carrying heavy objects and climbing stairs. Understandably, this stretched and strained his shoulders and both shoulders were becoming progressively more painful.

Examination showed tired, drooping shoulders with muscle flaccidity, a full range of motion, and highly sensitive ligaments and muscle attachments along the humeral head. X-ray films showed several areas of calcareous deposits in the cuff. The patient was otherwise in good health except for a long-term ache in the low back that was becoming more bothersome.

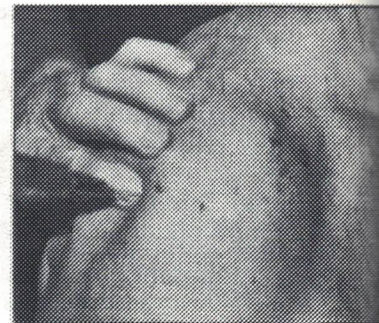


Figure 5: Injection of painful cuff areas of right shoulder.

This case indicated a definite need for sclerosing injections. No other treatment that I know of would strengthen and repair the degenerative changes in both shoulders and low back of this patient. Injections in both shoulders and low back were given at each visit. Lidocaine, hydrocortisone, and Formula 61 (2 ml, 0.5 ml, and 2 ml, respectively), were distributed in the most painful area of the shoulders. In low-back areas, 1 ml QU plus 2 ml lidocaine were injected into the sacroiliac and ilio-lumbar ligaments; anti-inflammatory medication plus an analgesic was to be taken four times a day three or four days after injections. After a few weeks as his condition improved, medicine to be taken orally was unnecessary. The patient was advised to reduce his work load (Fig. 5).

Results were very good. Pain decreased steadily. All areas were symptomfree in three to four weeks. On last check, three years later, the patient was still doing both jobs without pain.

CASE 6.—Tear of anterior shoulder ligaments (traumatic)—A short, heavy man who was a construction worker had lost his balance and, to prevent falling, grabbed a scaffolding by one arm and held on until help arrived. After the incident, his chief complaint was severe pain anteriorly in his shoulder. He had seen several doctors, and the last one ordered vigorous exercise. After several months of trying the exercises, he

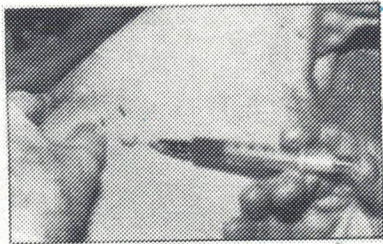


Figure 6: Injection of coracoclavicular region of anterior shoulder.

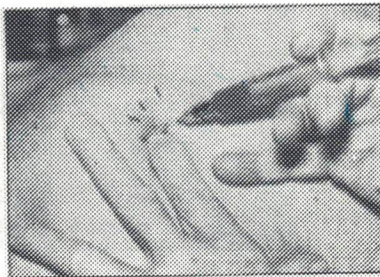


Figure 7: Injection along coracohumeral ligament.

came to our office in severe pain. His previous doctor had told him that exercise was the only treatment indicated and that he must learn to live with it. He had been unable to work for six months.

X-ray films showed nothing. Examination of the involved area showed extreme sensitivity in the coracoacromial, coracohumeral, coracoclavicular, acromioclavicular, and part of the capsular ligaments. Otherwise, the patient was in good health.

In this case, where ligament tear was probable, a series of sclerosing injections was the one and only indicated treatment. The exercise regimen that had been advised previously was contraindicated. Treatment consisted of weekly injections of a mixture of 1.3 ml of Formula 61, 2 ml of lidocaine, and 0.5 ml of hydrocortisone for the first two or three weeks. After that time, the steroid was omitted. A 1½-in, 25-gauge needle was used and with one finger on the coracoid process as a guide, injections were made up under the clavicle and into the acromial process at two sites, then angled out to the humeral and capsular ligaments as predetermined by palpation (Figs. 6 and 7). Usually, six to eight sites were injected at each visit. After a few weeks, the acromioclavicular area and the area along the coracoid process were injected. Usually, a total of 4 ml of solution was used, 0.5 ml at each site at each visit. No postinjection medication was necessary in this instance.

The pain decreased after each visit and he was able to use his arm for normal activity after three to four

weeks. The patient moved to Canada when he was about 75% improved and was not followed up.

Elbow Problems

Acute Medial Epicondylitis—This term is often applied to the painful swollen attachments of the forearm flexor muscles whose tendons travel across the medial epicondyle. Since small bursa under the tendons are also involved, the condition should more accurately be called tendobursitis. This condition is mostly due to excessive use of the forearms.

CASE 7.—A man who was an operator in a refinery had a job involving constant turning of valves. In the few months before his office visit, both elbows on the inner sides were becoming swollen and painful. On examination, both medial epicondyles were red, edematous, and very painful to touch and use. The diagnosis was tendo-bursitis resulting from excessive use.

CASE 8.—A woman worked as an operator in a factory. She used her hands and arms for eight hours a day, five days a week. In recent months, both elbows on the inner side had become red, swollen, and painful to touch and to use. Otherwise, the patient was in good health.

Both of these patients were told they must take a month or more leave of

absence and limit the use of their hands and arms. They were shown how to massage and stretch the forearm muscles without involving the sore attachments, which was to be done for a few minutes four times daily. Injections of hydrocortisone, 2% lidocaine, and Formula 61 were made at three sites around each medial epicondyle at each visit. Painful trigger areas indicated by the patient and the physician's examination were the guides. About 0.5 ml of solution was injected at each site with a 25-gauge, ¾-in needle. After three weekly treatments, about 75% of the pain had disappeared. Both patients were able to return to their regular work after four weeks. They were advised to avoid or at least vary the pull on the involved group of muscles while doing their work. On rechecking a year later, both patients were normal; there were no recurrences on checking two years later.

Lateral Epicondylitis—The conditions that elicit pain that occurs around the lateral epicondyle are more complex than those of the medial epicondyle. The tissues involved are the annular ligament, radiocollateral ligaments, supinator muscles, interosseus membrane. In this group of articulations, the head of the radius butts up against and rotates on the humerus. The head of the radius also articulates and rotates against the ulna. Strong ligaments surround the head of the radius, and strong ligaments hold all three bones together. Powerful muscles produce the rotating action of the radius against the ulna and the humerus. These muscles—when overused as in tennis, baseball, or using tools in a twisting motion—tend to become overdeveloped, tense, and spastic. Their continued use then produces an abnormal amount of stress on the radiohumeral and radioulnar articulations, the trauma of which produces bursitis, fibrositis, and sometimes a lock-

ing or jamming of the joint (lesioning). This mechanism may be caused by one acute episode such as strenuous use of a screwdriver, or as in a recent instance of a dentist doing an extraction, by a specific twist-jerk motion. The term "tennis" elbow is loosely applied to this condition.

Management obviously includes: (1) manipulation of forearm muscles and fascia by deep pressure with patient following up at home; (2) avoidance or careful use of elbows for a sufficient amount of time—at least several weeks; (3) manipulation by the doctor of the radioulnar joint to release any restriction of motion; (4) injections of two types: one into myofascial trigger points at one or two of the most sensitive spots of the forearm using small amounts of lidocaine and hydrocortisone for the release of muscle spasticity, and the other around the radioulnar trigger points with injections of lidocaine, Formula 61, and hydrocortisone. Not more than 0.5 ml of solution should be used at each site.

In my experience, treatment at weekly intervals brings the best results. Muscle and fascial normalization is important in correcting the primary cause, whereas the injection into the periarticular ligaments, capsule, and tendons relieves pain, repairs, and strengthens the secondary conditions. This treatment is not too painful and quite successful.

When injections are used with or without sclerosing solutions, it is advisable to give additional medication regularly for several days since reactions vary as individuals vary. In inflammatory conditions give 2.5 mg prednisalone and an analgesic four times daily for four or five days. In acute and severe situations, a narcotic (Percodan)

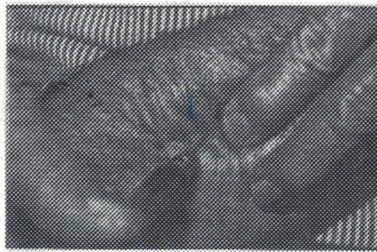


Figure 8: Injection of painful myofascial triggers along radius.

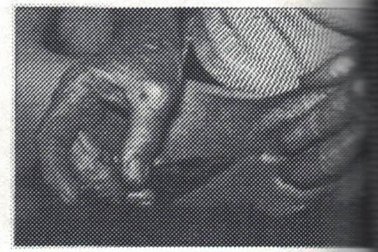


Figure 9: Injection of radial collateral ligament.

should be available to reinforce the analgesic if needed (Figs. 8 and 9).

Acromial Clavicular—The acromioclavicular articulation on the top of the shoulder is involved frequently. This is a flat, end-to-end joint that responds well to sclerotherapy. The acromioclavicular ligaments are flat and thin and not difficult to inject. The same technique as described for lateral epicondylitis is used for this condition.

The Ankle Joint

Injection technique, primarily sclerotherapy, has proven to be a highly effective method of ligament strengthening and repair in recurrent spraining of the ankle joint. In this condition, the lateral aspect of the ankle is swollen and painful and collapses easily. At times, the medial area is also involved. Occasionally, the cuboid bone enters into this ankle syndrome and is found to be painful to pressure and often depressed.

The most effective treatment approach to this type of ankle-foot problem involves four parts.

—Correct evaluation includes bony positioning; checking for dropped cuboid bone or other bones of the transverse arch;

evaluating longitudinal arch for muscle insufficiency and flaccidity; and determining foot "roll in" with patient standing.

—Correcting structural abnormalities with wedging to correct "roll in"; manipulation of the foot to restore normal positioning of transverse arch bones; recommending foot exercises to restore muscle tone; and recommending the correct shoes.

—Injection of weakened ankle ligaments should be done weekly using the recommended techniques, which include injecting a mixture of 2 ml Formula 61 and 2 ml lidocaine to which 0.5 ml hydrocortisone is added in acute inflammation. Inject a third of the mixture around the malleoli, a third of the mixture directly around the capsule, and the rest into the lower ligament attachments. Usually only one side (medial or lateral) is treated at a visit. Four or five multiple-site treatments are necessary (Fig. 10). Observe the usual precautions.

—Correct type of shoes have medium heels and a straight innersole design.

Basic Conclusions

These are basic conclusions that have become evident after some 35 years of practice.



Figure 10: Lateral ligament injection sites of ankle. Three entry points, three sites each entry point.

—The ligament rebuilding and joint stabilizing of sclerotherapy blends with and definitely complements structural evaluation—manipulative techniques and structural correction (lifts) in osteopathic medicine.

—In the situations involving recurrent sprain-subluxation of articulations after osteopathic evaluation and correction methods are not entirely successful, the injection of sclerosing solution using the technique described in this article will effectively relieve pain, decongest, strengthen, and shorten the ligaments and can also provide the support necessary for normal function of the joint.

—With proper follow-up and booster injections, a permanent result can be obtained in a high percentage of cases treated.

—There are no contraindications to the injection of sclerosing solutions in indicated conditions except the rare instances of sensitivity to the anesthesia. There have not been more than three instances of mild allergic reaction to the local anesthesia with no serious effects in my experience.

—Also, in the past seven years in which eight patients required surgery for a low-back disk

syndrome following adequate ligament sclerosing, all had successful results surgically, which supports the opinion that preliminary ligament strengthening was the deciding factor. The surgeons did not report any interference to the surgical procedure because of the sclerotherapy injections.

—Recurrent sprain-subluxation of articulations in the cervical and dorsal spine, which is the basic pathology of the osteopathic lesion, cannot usually be permanently corrected without correcting pelvic imbalance and providing adequate ligament support.

—When postlaminectomy pain persists after surgery, it is probably of fascial or ligamentous origin. Sclerotherapy usually is effective in this situation.

—Pain often encountered in postsurgical scar tissue after surgical procedures involving the low back responds well to needle techniques.

—The role of ligaments in body mechanics and dysfunction has been and still is greatly overlooked and undervalued.

—On the basis of years of experience and thousands of cases, I think that failure to recognize the importance of sclerotherapy and to treat ligament weakness and insufficiency before surgery in the low-back symptom complex is the major factor in poor surgical results.

Comments on Other Injection Techniques—Steroids—Steroids are anti-inflammatory agents with some analgesic action. Their action is short in duration except in the aqueous suspension form which absorbs slowly (Depo-Medrol). Acute local inflammatory conditions such as bursitis, tendonitis, and tenosynovitis are most successfully treated by both fast- and slow-acting steroids. Injections are either intra-articular or periarticular for joints.

For bursal sacs, the injection is into the sac.

Steroids must not be confused with sclerosing solutions. Steroids relieve acute inflammation for a short time, but actually have the lytic effect of softening ligaments thus providing further weakening. Sclerosing solutions relieve pain but promote growth of new connective tissue also and offer a probability of permanent correction of joint problems if used correctly.

Local anesthesia—Some doctors use local anesthetics by injection as their primary approach to musculoskeletal problems. This technique blocks painful nerve pathways, but does not have the reconstructive action of sclerosing solutions and, therefore, gives only temporary relief.

Acupuncture—After attending symposiums and reading the literature, it is my observation and opinion that acupuncture has two effects.

Acupuncture is best described as a temporary interruption of nerve pathways, thus relieving pain and producing temporary analgesia and a mild tonic effect resulting from stimulation of nerve pathways by various methods. There seems to be very little of value that acupuncture can add to the techniques described in this article.

With controversy raging concerning the value of acupuncture, I will not offer further comment with this one exception. There is no doubt about what sclerotherapy does—it produces joint strength, it stabilizes, it relieves pain, and its use results in a high percentage of permanent cures: its action is definite.

Chymopapain—The injection containing chymopapain continues to be a controversy between orthopedists and neurosurgeons. At present, it is banned by the

(from p. 91)

government. The investigative reports are certainly not good or supportive of the procedure. The results of the methods covered in this article outshine those of this questionable enzyme treatment.

Discussion

So much of the reading material in every physician's office deals with the unusual, the spectacular, or the dramatic—diseases very few general practitioners will ever see or have any interest in. On the other hand, a recent study showed that the second most frequent chief complaint of patients entering the physician's office is musculoskeletal; the first was upper respiratory problems. Thus, one would think that every effort would be made to improve treatment for these common complaints. This has not been so. Sclerotherapy, for instance, has had more than its share of opposition. If the critics and skeptics of this valuable technique were knowledgeable, if they had thoroughly investigated, observed, and compared, this criticism would be understandable. But such is not the case.

It is difficult to forget in my own practice the 30-year-old plant employee with a recurrent low-back problem. My evaluation indicated ligament insufficiency and he was progressing nicely after about four injections when the chief of the plant's medical department hinted that his job might be at stake if he did not have surgery. The man gave in and went to an orthopedist. Surgery was done and a few days later the man died. About a year or so later another patient under exactly the same circumstances was paralyzed from the hips down after disk surgery and died 2 years later; before surgery he

The second most frequent complaint of patients is musculoskeletal. One would, thus, think that every effort would be made to improve treatment for these complaints.

was improving under our injection therapy. These cases were tragic and unnecessary. There should be little doubt that if there is a way other than surgery to restore the person debilitated by low-back pain to normal life, it should be used.

In the *Forum of Osteopathy* some time ago, the question was asked, Do you use sclerotherapy in your practice? The question should have had a second part such as, How much exposure or experience have you had in sclerotherapy? The answers were interesting, from "do not need it" to "of no value," and so on. But a good percentage of replies were from physicians who honestly said "do not know enough about it to evaluate." It is obvious that one must see sufficient patients before, during, and at the end of treatment to fairly evaluate the results.

Solutions—The solutions we use in sclerotherapy are:

—Lidocaine (2%) used exclusively for the past five years with only one proven allergic reaction

which was mild. It is best to use small amounts.

—Aristocort Forte Parenteral or Depo-Medrol (40 mg/cc) is for special use as mentioned before.

—Hydrocortisone acetate suspension (50 mg/cc) is used in small amounts 0.3 to 1.0 ml usually mixed with local anesthesia for hot areas typical of bursitis, tendonitis, tenosynovitis, and in inflamed large muscle masses or fascial planes. However, we have found that by adding a small amount of a mild proliferant (Formula 61) the effect is more prolonged in tendons and bursa.

—Formula 61 is a mild tissue proliferant in aqueous solution containing well-tolerated irritants, used in small areas or as the first injection, and usually mixed with lidocaine and sometimes with hydrocortisone (see Addendum section at end of article).

—Plasma QU contains some of the solutions used in Formula 61 plus glycerin, quinine and urea hydrochloride, and 2.43% phenol in aqueous solution.

This is a basic solution used by many sclerotherapists for ligament strengthening. The phenol is probably the most active stimulant along with quinine and urea hydrochloride. This solution is mildly anesthetic, can be spread with a thin needle, and does not cause a slough or untoward side effect.

—Other solutions include one developed by George Hackett, M.D. In his books, he describes a "sugar" solution which has a formula that contains 25% dextrose, 25% propylene glycol, 2.5% phenol, and distilled water.

Sugar and phenol are both well-known tissue irritants. This solution is used by many doctors. In my experience, this solution is not as effective as the one recommended in this article.

Sodium morrhuate is used by some sclerotherapists. It is specific for varicose vein sclerosing, but is not as efficient as the recommended solutions in ligament injections in our experience.

I have been informed that silica solutions have been banned by government orders (personal communication).

Syringes and Needles—In all joint ligament injections, I use a 5-cc Thermex-glass-Luer syringe with a Gabriel lock.^b The syringe has a short ¼-in stylus for puncturing vials in mixing solutions. Glass syringes work more smoothly than disposable ones and 5 cc is about right for ease in handling. They must be carefully cleaned and autoclaved.

Needles used and recommended are of four lengths.

—Two-inch 23-, 24-, and 25-gauge needles will reach most sacroiliac and lumbosacral ligaments using the technique described. Occasionally, a 3-in 22-gauge needle is necessary. The 2-in 25-gauge needle is difficult to get and is thin and whippy, but with experience can be safely used and causes less trauma and discomfort.

—One-inch 25-gauge needles will reach interspinous ligaments without danger of going too deep. In the dorsal area, a 1½-in 25-gauge needle may be used. The 1-in 25-gauge needle is also suitable for knee injections.

—A 1½-in 25-gauge needle may be necessary for injections of middorsal and upper dorsal interspinous and facet ligaments and for the first rib and the insertion of the levator scapula. The latter injection is into tendinous attachments on the superior border of the scapula, a spot frequently found to be painful and weak.

These needles are all thin but strong. The point will easily bend and hook if bone is touched too roughly. When this happens a new needle should be attached before any reinjection. Silica solution requires heavier needles, only aqueous solutions will flow through a 25-gauge needle. A recent article advised that a needle should be long enough so that it need not be injected as far as the hub to minimize the chance of breaking. If used correctly, breaking is almost impossible. But for the beginner, a 2-in 22- or 23-gauge needle may be preferable for the sacroiliac and lumbosacral injection. There is a possibility of a 25-gauge needle wandering and slipping over the pelvic brim during a sacroiliac injection.

Dangers, Errors, and Limitations—Possible errors of omission are mentioned here.

—In lumbopelvic injections, it is fairly easy for the needle to slip over the pelvic crest. Bony anatomy differs widely. Therefore, it is important to move the leg back and forth, with the patient in a

prone position, to identify accurately bony landmarks and the injection starting point. If the needle slips over the pelvic crest the feel will be different. A small amount of sclerosing solution in the gluteal area will do no great harm but no good either.

—Insufficient treatment: Fibrous connective tissue stimulation is slow. Time and sufficient treatment produces successful results in many cases not readily responding.

—Too much solution: The amounts given will do the job.

—Too frequent injections: A week should be allowed between injections to permit normal body reaction.

—Depositing sclerosing solutions in already irritated muscle tissue such as into lumbar muscles before or after entering ligaments as in a low-back injection should be avoided. This further irritates the already painful and spastic muscle that will remain sore for several days causing the patient distress. If muscle pain is to be dealt with use procaine plus hydrocortisone—injecting into the



^bEisele and Co, Inc, Nashville, Tenn.

As a recommendation to a beginning sclerotherapist, be sure to see and follow-up as many and as great a variety of injection cases as possible from start to finish.

muscle, fascia, and ligaments, respectively. Follow this with the sclerosing agent into ligaments only.

—Not insisting on rechecks and booster injections at regular intervals depending on symptoms, needle feel, and type of work done by patient is a mistake.

—Limitations: Sclerotherapy only rebuilds ligament and tendon support causing stability to an articulation. The ravages of wear and tear plus the associated soft tissue changes such as myositis, tendonitis, and arthritis must receive the appropriate treatment in support of or subsequent to the injection therapy.

Recommendations for the Beginner in Sclerotherapy—(1) An articulated human spine and pelvis, articulated knee, or articulated shoulder girdle are desirable. Careful study of these models (and the patient) is basic for good results. (2) X-ray film viewer should be used, preferably one that will show three 14 × 17 films at the same time. The constant study of X-ray films is absolutely necessary. (3) Study cadaver dissections if possible. (4) Contact experienced doctors for consultation and help. Join and attend conventions held by the American Osteopathic Academy of Sclerotherapy. (5) Be certain to see and follow up as many and as

great a variety of injection cases as possible from start to finish. The weakness in the present teaching system is failure and inability to do this. An occasional lecture or demonstration is inadequate.

Summary

In this article, case histories were given of typical musculoskeletal problems common in every general practitioner's practice. Management using specific procedures such as obtaining patient history, doing workup, and osteopathic technique and injection technique are given. Underlying anatomic and physiologic factors were discussed with interpretation and applicability to musculoskeletal problems, in general and the case histories, in particular. Recommendations for promoting better understanding and a wider use of this adjunct, which is vital to the improvement of the musculoskeletal phase of osteopathic medicine, is also considered.

Addendum

Since this article was written, Formula 61 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 instead of 1 ml of Formula 61 the physician should use 0.5 ml of Hackett's solution,^c 0.5 ml QU, or 0.33 ml of sodium morphuate.

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

^cChase Pharmacy, Baltimore, Md.