the technique of the surgeon and of the theatre staff is perfect, and nothing less must suffice, it will be found that bones are not filled with "black ingratitude" as was formerly thought, but will fulfil the surgeon's highest expectations.

Failure to treat the soft tissues gives as bad an after-result as failure to treat the fracture adequately. Thus active exercises, physiotherapy, occupational therapy and general rehabilitation must be started from the first day of injury as described previously.

Finally, the financial and economic side of the patient's happiness should be attended to. The writer is reminded of one of his patients, who was off work for seven months with no compensation. This was due to the fact that he fell and fractured his femur on his way to work and not while at work. Both he and his family, including two children, were on relief throughout treatment. The patient's treatment should not be marred by such financial worry. Such cases are questions for legislation, but it is the duty of the medical profession to make its voice heard in such matters.

The patient should always be treated as a whole and not, for example, merely as a case of a fractured femur.

SCLEROTIC THERAPY IN PRACTICE IV.

The Injection Treatment of Hydrocele and Some Other Conditions

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Varicose veins and haemorrhoids have been discussed in previous articles, and it now but remains to say a few words about some common conditions occurring in general practice, which may be frequently benefited by injection treatment. The mention of rare conditions and of conditions in which opinion is divided as to the value of sclerotic treatment are especially avoided. Cystic hygroma, branchial cysts, ranula, certain mammary cysts, varicocele, enlarged prostates and herniae have all been the subject of writings regarding the advantages of injection treatment.

If some of the statements in this short article appear too elementary and trivial to warrant mention, it must be remembered that attention to detail is of paramount importance in these simple treatments. Dickson Wright, that great teacher of our times, will spend much time teaching students how to sharpen a needle before injecting a varix (5 c.c. of lithocaine in the wrong place makes a nasty mess!). He frequently states that

it is harder to apply a bandage *correctly* than it is to remove many a gall-bladder.

For some reason difficult to fathom, the injection treatment of **idiopathic hydrocele** appears to be a much neglected therapy. Patients are constantly being advised surgical treatment when a simple injection will produce a permanent and perfect result. Campbell (1937) wrote regarding 76 cases of infection in 502 cases treated by surgery. Furthermore, he showed that there was a 6 per cent recurrence rate, and that there was some post-operative haemorrhage in 18 per cent. Add to this hospitalisation, expense, and anaesthetic risks, and it is difficult to understand *why* cases are so treated, since the only contra-indications to this form of treatment are in those cases in which a preliminary aspiration of fluid has demonstrated the presence of an abnormal testicle. It is agreed that the hydroceles of the new-born and those of early infancy should be left alone for some time, since spontaneous resolution is probable. Should this condition persist into later life, surgery is the best treatment having regard to the possibility of the persistence of a congenital opening into the peritoneal cavity. The presence of a haematocele or of a spermatocele is a further indication to avoid injection. There is some difference of opinion among surgeons regarding the injection of the spermatocele. Some advocate it, but owing to the frequently associated disease of the epididymis it is wiser to attack the matter from the surgical angle so that the organ may be removed at the same time if it be considered necessary. Injection of a spermatocele may anyway be a painful matter owing to the active communication with the testicle or epididymis. Beyond these provisos it is safe to say that there are but few cases of hydrocele which cannot be cured easily by injection. Bilateral hydrocele occurs in about 4 per cent of cases, and the two sacs may be treated at the same time, although a time interval is preferable. The patient must be warned that from one to four injections *may* be required in order to effect a cure. He should not lose any time from his work however, and with normal care runs very little risks of a complication. This care consists in putting the right amount of solution into the right place and the strict avoidance of sepsis.

The following are the rules for successful injection treatment.

1. The patient should lie on a couch with the legs well separated. The scrotum is supported by means of a sling of elastoplast stretching between the thighs.
2. The site of injection must essentially be *high up* towards the neck of the scrotum. This is of importance, since neglect of this precaution

may allow the leakage of sclerosant through a puncture situated in the dependant part of the scrotum. The resulting gangrene may lead to septic complications of serious import.

3. Transilluminate the hydrocele so that veins may be avoided by the needle.
4. Use tincture of metaphen to disinfect the scrotum before puncture. This is a septic area, and this disinfectant appears to be the most reliable for this type of work, and is also less irritant than iodine.
5. Anaesthetise the puncture site by means of novocain in 2 per cent solution, using a fine needle.
6. Evacuate the sac contents through a wide-bore needle, using either a 50 c.c. or a "two-way" type of syringe.
7. Carefully palpate the testicle to exclude abnormalities of this organ.
8. Being fully satisfied that the needle has remained in the sac, inject from 5 to 8 c.c. of Quinine-Urethane solution.
9. Remove the needle, seal the puncture with collodion flexile, and massage the parts thoroughly so that the solution may be properly spread in the sac.
10. Apply a scrotal support, with instructions that it should be worn throughout treatment, give a sedative for the night, and tell the patient to report in one week's time.

During this time the fluid frequently re-accumulates in the sac. Aspiration should only be done if this collection is excessive. A further injection should not be considered for about a month, and is frequently not required.

In the case of having to give further injections the choice lies between increasing the dosage of sclerosant or else giving a "twin injection" as in the case of resistant varices. In such cases the quinine may be followed by from 4 to 8 c.c. of lithocaine (Maingot's solution). The only disadvantage to the use of lithocaine is that it can produce a severe degree of pain, not present when quinine alone is being used. Sometimes severe shock may be added to this complication. When using lithocaine it is as well to wash out the sac with 4 per cent novocain before injecting, this lessens the pain and mitigates against shock.

Dosage of sclerosant depends upon the size of the swelling. Most operators err in giving too small a dose. The common causes of failure are in the use of too small a dosage, in the neglect to evacuate all the fluid from the sac, or in failing to persevere with this safe and simple method for a sufficient length of time. The commonest mistake is to inject

too low down in the scrotum, with the complication already described.

The results of the injection treatment of **ganglion** were discussed in the first of these articles, and it now but remains to give the practical details of the injection technique.

All simple ganglia may be safely treated by injection, but in the case of those which are situated deeply in the tissues it is better to remove them surgically owing to the possibility of infiltration of the sclerosant during the injection. Multilocular ganglia are also best treated surgically, but beyond these two types of case, injection is generally successful, and is certainly less likely to give rise to complications. It is of interest to note that it has been reported by Carp and Stout that there is only a recurrence rate of 2 per cent after ganglia have been treated by simple rupture.

Ganglia occur more frequently in women, and the common situation is in the neighbourhood of the wrist joint. Other sites of frequent occurrence are around the knee and ankle joints. The palmer aspects of the fingers and hands also commonly demonstrate these rounded swellings filled with a gelatinous fluid.

The method of injection is simple.

1. "Fix" the swelling by either flexing or extending the joint.
2. Make an anaesthetic wheal with novocain over the most prominent part of the swelling.
3. Insert a wide bore needle and express the jelly-like contents of the sac.
4. Inject 4 per cent novocain and aspirate this solution after a minute.
5. Inject Collodion Flexile in such a quantity that the sac is moderately distended. Leave this in place for *at least five minutes*.
6. Aspirate the major part of the collodion, leaving a small amount only in the sac.
7. Apply a pressure dressing of elastoplast.
8. Immobilise the joint for a day or two. Recurrences will be less frequent as a result of this precaution.
9. If necessary, repeat the treatment a month later.

The injection need not be painful, and the use of collodion appears to be much more satisfactory than does the use of mono-ethanolamine or the other sclerosants.

The injection treatment of **Bursae** should be confined to those which do not communicate with joints. Pre-patellar, olecranon and adventitious bursae fall into this category.

No injections should be given in the presence of sepsis. Acute bursitis will usually react to immobilisation and the application of heat.

The technique of injection is as for the treatment of ganglion. In the case of bursa, however, it is best to use a mono-ethanolamine as the sclerosant and not to evacuate the sclerosant after injection. The dosage must depend on the size of the swelling. In cases of marked fibrosis of the sac, it is not worth giving more than two treatments. In such persistent cases surgical removal of the sac is usually indicated.

Naevi usually react well to sclerotic treatment, and this form of therapy compares favourably with the results of the many other types of therapy such as X-ray, radium, carbon-dioxide, snow, etc. The "port-wine mark" should not be submitted to injection treatment but the "strawberry mark" or cavernous type of naevus reacts very well to injection, provided that the extensive deep-seated haemangiomas are excluded from this statement.

The cavernous naevus consists of dilated intercommunicating vascular channels, and it must be remembered that this type frequently disappears spontaneously in adult life. This fact must be allowed due weight when assessing whether any treatment is required or not.

The technique of injection is not difficult, and the following are the main points to observe:

1. Use a dental syringe and finest needle.
2. Mono-ethanolamine is the best sclerosant to employ.
3. Make the injection through one spot at the edge of the naevus, pushing the needle along radial paths from this single puncture.
4. Give minim doses, and do not use more than 1 c.c. in all.
5. Move the needle to a different spot as each area blanches from the injection.
6. Do not inject too deeply, and do not inject too much if all risk of sloughing and later scarring is to be avoided.
7. Failure to produce a good result does not preclude the use of alternative measures.

The injection treatment of **Anal Fissure** must be confined to those cases which are recent in origin and which are uncomplicated. Any sepsis in the anal region negatives this treatment.

Haemorrhoids are commonly associated with anal fissure. These must be treated so that a recurrence of the fissure does not result. A proper degree of anaesthesia in the area of the fissure will usually allow the introduction of the proctoscope for the injection treatment of the pile condition. The object of the injection is to produce a prolonged anaesthesia which will allow the anal sphincters to relax. An additional factor in the healing of the fissure is the production of a mild sclerosis of the stagnant venules deep to this ulcer. Such sclerosis is occasioned by the formation of an oil granuloma with resulting fibrosis, and has the same effect in the healing of the fissure as does a similar type of process occurring in the injection of the feeding veins of a varicose ulcer.

During the period of treatment it is essential that a regular bowel action should be encouraged, and that strict anal cleanliness should be enforced.

The main points in the injection are as follows:—

1. The genu-pectoral or left lateral position is adopted by the patient.
2. A point half an inch behind the fissure is infiltrated with novocain. The injection is intra-dermal, using a fine needle.
3. A wider bore needle is introduced through this spot, and a finger is inserted into the rectum so that the point of the needle may be guided underneath the fissure.
4. Two c.c. of procaine or Morgan's solution (1 c.c.) is injected under the fissure, a similar dose on either side, and a fourth dose into the external sphincter muscle.
5. This procedure is repeated every week until healing has occurred.

If after four sessions healing is still delayed, it is better to perform the operation of excision of

the fissure with division of the fibres of the external sphincter muscle.

In all cases in which a sentinel pile is present, this should be removed under local anaesthesia.

The condition of idiopathic **Pruritus Ani** frequently requires injection treatment in order to allay all symptoms.

Before undertaking injection therapy it is necessary to exclude all organic causes of the PRURITUS. Conditions such as threadworms, diabetes, tinea, irritating discharges, etc., must all be considered. The operator must satisfy himself that the rectal pathology is not abnormal. Piles, fissures, fistulae, skin tags, etc., must be looked for and treated.

The patient should be instructed regarding anal cleanliness, the general health must receive attention, oily aperients should be banned, wool and not toilet paper should be used, and a sedative of the luminal type is often needed. Add to this an enquiry into the psychological state of the sufferer, and if, in spite of all this, he *still* suffers, follow out the following method of injection.

1. The left lateral position is a suitable one. The buttocks should be widely separated by an assistant.
2. Anaesthetise two points one and a half inches in front of the anus and two points behind at a similar distance.
3. Inject 5 c.c. of proctocaine at each of these points. Inject as the needle is pushed in and as it is withdrawn, and make sure that the anus

is completely "ringed" by these injections. In this way the nerve supply is blocked. The injection must be subcutaneous, and not into the skin.

4. Repeat the injection in one month if necessary. Symptoms should disappear for this length of time if the injection has been given correctly. During this time scratching has been avoided, and in some cases the symptoms fail to return even after one series of injections.
5. Never inject in the presence of sepsis if sloughing and abscess formation are to be avoided.

The alternative of the various forms of surgery for this condition are of a formidable nature and are seldom necessary, since the prolonged anaesthesia and the thrombosis of the underlying vessels occasioned by this oily solution are all that are required to produce good results in most cases. However, it is as well to point out again that no neglect must occur with regard to the other measures, both general and local, which have already been mentioned. The injections must be looked upon as a valuable adjunct to treatment.

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In the last part of Dr. Foote's article, unfortunately, Diagram C was missed out. Reference to page 102 is given on Page 147 of this issue with a short detailed report.