SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

TRAUMATIC SYNOVITIS AND INJURIES TO THE LIGAMENTS OF THE KNEE-JOINT

(EXCLUDING MENISCUS INJURIES)

BY

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Synovitis of the knee is recognized by the enlargement, warmth, and tenderness of the joint; there may be a soft crepitation on movement, with pain and resistance before the normal limits of flexion and extension are reached, and the joint is usually held a little flexed.

Acute traumatic synovitis of a knee-joint may be due to: (1) a direct contusion of any part of the knee-joint; (2) a sprain—that is, the stretching or tearing of ligaments by a forced movement in any direction beyond normal limits; (3) overuse or unaccustomed use—for example, strenuous football or ski-ing after inadequate training; (4) a fracture involving the joint (to be dealt with in the next article). Chronic traumatic synovitis may follow continued excessive use of a normal joint or ordinary use of a joint which is poorly aligned for strain or weight-bearing.

Diagnosis

It is necessary to exclude a ligamentous sprain or rupture, a fracture, and an internal derangement before we can diagnose an uncomplicated traumatic synovitis. The ligaments are first tested and the exact locality and extent of any damage noted. If the injury has been at all severe radiographs (antero-posterior and lateral) are taken in order to exclude fracture, including the uprooting of a tibial spine.

An internal derangement is evidenced by the history of something going out of place and immediately locking the joint—that is, limiting its full range: a subsequent sensation of something slipping into place again is almost pathognomonic. Occasionally the displacement is so quickly followed by replacement that neither “locking” nor “unlocking” is noticed. The lock associated with internal derangement is quite different from the stiffness associated with muscular spasm or with fluid and perisynovial infiltration; though when there is much limitation of movement and swelling after injury a lock cannot be discovered. Indeed, it is often impossible for anyone, faced with a hot swollen knee a day or two after a severe sprain, to say certainly, or even probably, whether a meniscus has been damaged or not. But it is one's experience that, in general, the more severe the ligamentous damage the less likely are the menisci to be damaged. If the ligaments are badly sprained the menisci themselves usually escape, though their attachments to the lateral ligaments may well be torn. The menisci suffer from rotary movements on an axis, associated with the maintenance of axial compression by intact ligaments rather than the non-axial strains which stretch and tear the ligaments. It is, however, often impossible to be sure, but it is bad practice to diagnose or even to suspect cartilage damage without something very suggestive in the history, symptoms, or signs.

Localization of Damage.—Having come to the conclusion that one is dealing with an uncomplicated case of traumatic synovitis of the knee, it is of the greatest value to ascertain exactly what has happened, and to localize the pathological condition underlying the synovial reaction. The success of treatment, judged by rapidity and permanence, rests on the exact recognition of, say, a local bruise or infiltration round a ligament, which, though exquisitely tender and so painful as to make walking impossible, may be dramatically cured by injection of a local anaesthetic with massage and active use. In another case a heavy blow on the articular margin of the tibia may cause a reaction of the joint so severe as to establish traumatic arthritis and prolonged trouble unless it is immediately and completely put at rest for just a few days. Careful palpation and the trial of various strains will usually disclose the nature and situation of the injuries.

Principles of Treatment

First among the principles comes the recognition that all joints have an ample and delicate sensory innervation. The nerve endings in the subsynovial tissues serve to protect the joint against overuse (witness the neurotrophic joint), and the sensory spindles in the ligaments give warning of dangerous strains. This fully protective nerve supply explains the supreme need for *rest* once the joint tissues have become inflamed. The second principle concerned is that of *movement*. In dealing with a perisynovial or pericapsular infiltration associated with some severe injury there is an indication for early movement in order to avoid the organization and contracture of the granulation tissues into adhesions. The third principle concerns the preservation and restoration of muscular power and tone.

At first sight these three principles would appear mutually antagonistic, but if rest is made the rule, and movement the exception, in the form of a single, very gentle, and slow active movement through the greatest possible range, the inflamed tissues will not be irritated. It should be needless nowadays to point to the great superiority of active movements over passive by calling to mind the relaxation of the opposing muscles that follows active flexion and extension. Full rotary movements of the knee are beyond the control of the supine or sedentary patient. Their evolutionary value is to enable the body to turn and swerve on the fixed tibia and thus to escape the clutch or tackle of the foe. Then, again, the muscles can be kept in order by faradic stimulation and by contractions without movement, even by movements of the limb as a whole without movement of the knee.

We can then solve the dilemma set up on one side by the golden rule of rest for painful irritated tissues supported by Hilton, Thomas, and Robert Jones, and on the other by the desire to avoid adhesions, with delay or even impairment of function. If the ligaments are stretched or torn they need protection by posture or by splintage. In most cases the difficulty is easily overcome by an intelligent mixture of rest, movement, and massage: (1) Rest and, if need be, protection by splintage—for example, a broad aluminium or plaster-of-Paris gutter. (2) Single, very gentle, coaxed active major movements:

the masseuse should finally carry out the rotary movements of the tibia very gently and slowly. (3) Effleurage of the perisynovial tissues and surrounding areas directed toward emptying lymphatics and reducing the cellular infiltration in addition. In some cases graduated massage and active use rapidly restore normality. In a few instances the extra-articular injection of planocaine 2 per cent. into a tender and painful area, singly, or repeated daily for a few days, may allow the patient to be active and make all the difference in speed of recovery due to the absence of reflex and disuse atrophy.

Organized "Adhesions"

In a rather different category are the cases of synovitis seen at a later stage when there is already limitation of movement by organized adhesions; in these, preparatory physical treatment, followed by gradual active and passive movements, is indicated. The sedative effect of the infra-red ray or diathermy or plain radiant heat may be a valuable daily introduction to gradual manipulative movement. Manipulation under anaesthesia may be needed.

Chronic Synovitis

The knee in particular is dependent upon the integrity and strength of its muscles and ligaments, and chronic synovitis is peculiarly liable to persist after acute synovitis of the knee where the condition of the muscles has not been especially regarded. Although the original cause may have disappeared, synovitis is still present and kept up on account of the lack of muscular and ligamentous tone. A mild vicious circle exists. This is dealt with by impressing upon the patient the principles of (a) avoidance of strain, (b) the necessity for complete rest of the whole limb supported throughout its extent, and (c) active natural use, first for only two or three minutes at a time, many times in the day. Every means should be taken to improve local circulation by massage, diathermy, active movements, and exercises. The correct dosage of rest and exercises is assured if the muscles are gaining and the fluid losing day by day. The use of elastic knee-caps should be restricted to periods of fairly strenuous activity during the later stages of convalescence—for example, a rugby match—before the knee and its guardian muscles and ligaments are fully taut.

Rupture of Ligaments

The medial collateral ligament may be sprained or even completely ruptured by any powerful force opening the inner side of the knee. The tear is usually above the level of the joint near the upper attachment, which may be pulled away. Its wide attachment to the tibia is very seldom torn.

In moderate cases (sprains) the ligaments are pulled rather than completely ruptured, and treatment will vary with the degree of laxity and with the associated damage to the quadriceps and the vastus internus in particular if the damage concerns the medial ligament. A few days in bed with the joint slightly flexed over a pillow to relax the ligaments may be necessary to begin with. This should always be associated with massage, together with faradic treatment of the vastus internus and active muscular contractions of the quadriceps as a whole. As soon as the reaction of the joint is over, the patient is allowed up, but must be strictly told to wear only strong leather shoes and the heel on the side of the injury is wedged up—half an inch in the male and a quarter of an inch in the female. The patient can then walk on even surfaces with careful muscular control.

Treatment in severe cases (complete rupture) begins with the application of a plaster cast, unpadded except for a circle of felt to protect the patella. The knee is set at an angle of 175 degrees. A haemarthrosis may be aspirated before application of the cast, a lateral puncture into the suprapatellar pouch being the easiest, and the skin puncture sealed with collodion. The plaster cast extends from the great trochanter to just above the ankle-joint. Walking and leg-raising exercises are encouraged after the first day. For a really severe injury such as complete rupture three months of immobilization is necessary. But in many cases a long knee-cage can be substituted for the plaster after six or eight weeks.

The external collateral ligament is less often injured. Again the ligament does not rupture in the middle, but near one or other bony attachment; or its fibular attachment may be pulled off.

The cruciate ligaments may be torn or avulsed by extreme hyperextension, lateral angulation, or dislocation. The commoner causes are extreme hyperextension—as when at rugby a runner's impetus carries his body on with his weight-bearing leg held firmly by a tackler—or a backward displacement of the flexed tibia on the femur in a motor accident. To test for the integrity of the cruciate ligaments the patient sits opposite the surgeon with the knee flexed to a right angle and the foot firmly supported on the ground between the examiner's two feet.

Testing the cruciate ligaments.

Then the examiner grips the head of the tibia and tries to force it backwards or forwards under the condyles of the femur (see Fig.). Forward movement of a sliding nature indicates laxity or rupture of the anterior cruciate, and backward sliding signifies a posterior cruciate ligament lesion.

The treatment consists in immobilization at an angle of 170 degrees for two or three months in a hip-to-ankle plaster, allowing and encouraging active hip, ankle, and foot movements from the start and weight-bearing as soon as the acute symptoms subside, usually at the end of a week. After the plaster a hinged bucket caliper is employed. Everything depends on developing exceptional muscular strength and tone by intensive gymnastic exercises. Even in old cases muscular control may be sufficient to discount great ligamentous instability, and may enable the patient to lead an active life. Such an attempt should always be made before considering operative reconstruction of the cruciate ligaments by fascial grafts, arthrodesis, or the permanent use of a long knee-cage.

Dislocation of the Patella.—This may be purely traumatic or be predisposed by knock-knee. The dislocation has generally been reduced at once. The diagnosis is made from the history and the site of tenderness. The treatment consists in the development of the quadriceps

by active exercises and faradic stimulation. If the dislocation is recurrent there is need for expert choice of the best operation in regard to the particular case.

Dislocation of the knee is usually obvious; it will be revealed by radiographs if the enormous swelling obscures everything. Injury to nerves or vessels should be looked for and noted. Reduction is possible only under general anaesthesia; difficulties may be presented unless displacements of patella or hamstrings are recognized and dealt with first. If there is much effusion, aspirate under full aseptic precautions and observe for a week, immobilizing the leg on a slung Thomas splint; afterwards allow the patient to walk in a complete plaster cast at 170 degrees for eight weeks. This is followed by active physical treatment and the temporary use of a long knee-cage if necessary. The result is generally better than the prognosis.

EYE CASUALTIES IN THE WAR

BY

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At the outset of the war in 1914 no special arrangements were in force for either war-blinded men or the segregation of serious eye lesions in specialized hospitals.

Through the enthusiasm and energy of the late Sir Arthur Pearson St. Dunstan's was founded, and No. 2 London General Hospital organized by the authorities to receive and treat the men before passing them to St. Dunstan's. St. Dunstan's has trained and cared for its charges since 1914, adding new cases each year to its numbers, and building up an organization which is world-famous. With the ageing of the men the need for a home for the sick and those recovering from illnesses or operation increased, and in 1938 St. Dunstan's opened its new home on the Downs by the sea near Rottingdean. In it was put all that time and experience had shown to be of value to the blind, whose comfort, physical and mental, was provided for in every possible way.

Many months before September, 1939, the Council offered the home to the Government for adaptation as a hospital for the serious eye casualties of the fighting services in the event of war. The offer was accepted and plans were completed for conversion, staffing, and addition to the existing building.

St. Dunstan's by the Sea

As a result there was available on the outbreak of war a modern, very suitable building to which agreed ophthalmic personnel, surgical and nursing, was posted. The existing dormitories were readily turned into excellent wards by the minimum of necessary plumbing and wiring, and the existing treatment room adapted as a temporary operating theatre, the necessary equipment for which was already bought and on the spot. Rather more than 130 beds in four open wards, and in two corridors of two- and four-bedded rooms are available, and beds and equipment are in reserve for the conversion of lounge-room space into two more wards, so that somewhere near 200 cases can be housed.

Plans and specifications for a new operating theatre block were ready, and work was started on this necessary addition during the first week of the war, and the unit is expected to be ready for use by the end of November. A fly-over bridge carries the corridor to the block, which comprises changing rooms, anaesthetic lobby leading to two theatres, dressing room, and sterilizing room. Experience of the last war suggested that general, facial plastic, and nasal sinus surgery would need to be provided for,

and one theatre is equipped to this end, although both will meet the demands of either ophthalmic or other surgery. With lighting restrictions in mind and the avoidance of glass no windows exist in the block, which is artificially lit throughout, warmed, and air-conditioned by modern means. The windowless block fits in well with the requirements of both ophthalmic and E.N.T. surgeons.

The block is tucked against a high chalk bank, but its exposed sides are protected from splinters by steel sheeting and its roof by sandbags. Where the new corridor leaves the existing building a small but efficient x-ray department is being fitted up, bringing it into close contact with the theatres. The equipment for this department and the theatre block is of a very high order, and this factor and the beautifully designed and fitted "wards" will mean that serious eye casualties sent to St. Dunstan's will find it an admirably sited, comfortable, and efficient hospital, fully prepared to do all that is possible for repair of their wounds. In addition to the resident ophthalmic surgical staff a panel of consultants has been arranged so that all branches of work may be dealt with, and to add to the existing nursing personnel, specialized and auxiliary, there is held a list of V.A.D.s available for duty when required.

For those whose sad lot can only be that of blindness there is ready the whole organization of St. Dunstan's. Such men will be retained for the training, technical and psychological, which is directed to the founding of a useful and happy life under the disability of blindness.

USE OF STORED BLOOD FOR TRANSFUSION

SOME PRECAUTIONS TO BE TAKEN

We have received the following communication from Drs. H. F. Brewer, M. Maizels, J. O. Oliver, and Janet Vaughan, Medical Officers in Charge of the Emergency Blood Transfusion Depots at Luton, Maidstone, Sutton, and Slough, set up by the Medical Research Council on behalf of the Ministry of Health.

Since the outbreak of war considerable use has been made of "stored blood" for the treatment of civilian patients needing transfusion. Reports that stored blood has a somewhat greater tendency than fresh blood to cause reactions appear to have led to slight apprehension in certain quarters. We believe that at least some of these reactions may have been due either to faulty technique in the preparation of apparatus, the withdrawal, storage, or administration of blood, or to the use of unduly haemolysed blood, and that they should not be taken as condemning "stored blood" of itself. Blood has been distributed to a number of hospitals from the four Emergency Blood Transfusion Depots for London and the Home Counties, where the methods of collection and storage have been those outlined in the memorandum recently issued by the Medical Research Council. The reports returned have been uniformly satisfactory, although one observer, while appreciating the immediate restorative use in collapsed and exsanguinated patients, suggests that the tonic and anticoagulant value is less than that of pure blood.

Complete records of 160 miscellaneous cases—medical, surgical, and obstetrical—are available. They were given in all 219 pints of blood and were treated in forty-one different hospitals. The maximum amount any one patient received was six pints given as a continuous drip. Blood varied in "age" from a few hours to three and a half weeks. Group O blood was used in the majority of cases, but Group A and Group B blood were also provided on request. Slight rigors were recorded in ten cases, but in several such instances inquiry showed that the blood had been given cold. In three cases there was transient