SPRAINS AND DISABLED JOINTS.¹

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It is a truism which will admit of no dispute that a patient's condition should never be made worse by treatment, and yet it sometimes happens that an excess of care does harm. Joints become disabled after a slight injury — not from the injury, but from too great caution in treatment.

The following cases will serve as illustrations:

CASE I. A young lady, twenty-three years of age, when a student at Vassar College, sprained her right ankle. She was not a person of robust health, and the sprain was in no way unusual. She was treated by a physician in the neighborhood, who applied a stiff bandage, which was worn for several weeks. This was afterwards removed, the foot again examined, and a stiff bandage re-applied. The patient was told that if inflammation set in, there would be danger of a stiffness and a disabled condition at the joint which would cripple her for life, and that as long as there was pain and swelling, inflammation was present.

The young lady gave up her studies at Vassar, returned to her home, and for the following six months used her crutches, as she found that any attempt to walk on her sprained ankle caused pain. This she regarded as an indication of inflammation, and as demanding rest. At the end of six months an apparatus was applied to the ankle which enabled her to walk without crutches for a while, but she again turned her ankle and resumed her crutches.

In the following year the patient sprained her left ankle in attempting to walk with a cane. This ankle became painful and swollen, was treated by a stiff bandage; and the patient being unable to walk, she was confined to a wheeled chair, judging that pain and swelling demanded the disuse of either ankle, and that unless great care was used she would become crippled for life.

She remained in this condition for six months, and was brought to the Carney Hospital for treatment, not having stepped for a year upon either foot. On examination it was found that the muscles of both legs were weaker than usual. The patient was of a spare build and nervous type, but otherwise sufficiently healthy, though there was said to be a tubercular family history. All motions in both ankles were normal. There was no swelling of the joint proper, though there was said to be swelling of the foot at times. There was no malposition of the feet. The patient was timid and nervous (but no more so than usually seen in chronic invalids), but was thoroughly impressed with the necessity of the disuse of joints previously sprained, lest inflammation should follow and increase, perhaps necessitating amputation, as had been told her by the physician she had consulted at the time of the spraining of the first ankle.

Both ankles were bandaged firmly, the bandage being constantly worn. If these were removed, swelling of the feet would follow, which increased the anxiety of the patient.

The condition was manifestly one where the ankles were disabled by prolonged fixation and bandaging. The necessary treatment naturally consisted of improvement in the circulation of the limbs and the development of the muscles. This, in addition to the

furnishing of ankle-supports at first, and flat-foot plates (which were gradually removed) was all that was sufficient to establish a complete and permanent cure, although the treatment necessarily involved a period of several months.

CASE II. A lady, forty years of age, of active temperament, but without great physique, sustained a sprain of the left knee. There was pain and effusion into the capsule of the joint, which was properly treated by fixation and compression. Later, the fixation splint was removed for a time, but was afterwards re-applied; but the bandage compression was continued, and the patient told that if there was any increase of the swelling at the knee, it would be necessary to resume the fixation apparatus.

After a time the patient changed her residence, and came under the care of various surgeons who successively recommended fixation and compression. After a while the removal of either the bandage or the apparatus increased the painfulness of the joint and the swelling, so that the patient was practically disabled.

On examination it was found that the knee was smaller than the other knee. There was atrophy of the muscles above the joint of the compression. There was some puffiness of the subcutaneous tissue in the space between the ligamentum patellæ and the condyles. There was no swelling or fluid in the sac of the capsule or the patella. This patient was extremely apprehensive of any attempt to allow greater motion at the knee, or to diminish the bandage which tightly bound, not only the joint, but parts above and below it. A great deal of persuasion was necessary before the patient was willing to consent to any attempt to gradually remove the bandage. The removal of the bandage was gradually done, however, and was followed by gradually increasing gymnastic exercises developing the muscles of the leg. After several months a perfect cure was established, which has remained permanent in the subsequent three years.

CASE III. Similar to Case II, with the exception that both knees were affected. The bandage was worn firmly applied to both knee-joints. There was great atrophy; but on examination there was no evidence of any inflammatory or disorganizing process. There was complete motion at the joint; there was no swelling; there was muscular atrophy above the joint and also in the muscles of the leg. Pain and swelling were complained of if the bandages were removed, or if the patient took any active exertion.

This patient had been acting under the advice of several physicians who had examined her successively, and had informed her of the danger of using a sprained joint too soon.

The patient was unable to arrange for continued treatment, returned to her home, and at the latest report considered herself permanently disabled and had given up her occupation.

Although these cases are extreme ones, they will serve to illustrate a common opinion in the minds of the profession that sprained ankles and knees are to be treated with a good deal of care; that they are extremely tedious cases, and should be managed with great caution. This opinion is partly based upon what may be termed a tradition that anything involving the joints is hazardous. This belief, which amounts in some instances almost to a superstition, is analogous to what prevailed in the past generation as to opera-

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tions on the larger cavities, namely, the abdominal, pleural and cranial cavities.

In view of this feeling as to the necessity of caution in the treatment of any injury of the joint, it is well to consider carefully what dangers surround injuries of joints, and why there is need of special care. The chief dread after injuries of this class is of a resulting stiffened joint; and it may be desirable to call to mind the causes which will give rise to ankylosis in the knee and ankle, for these are the joints most exposed to injuries which are classed as sprains.

The pathological processes which give rise to stiffness at the joints are: (1) tubercular osteitis or synovitis; (2) the rheumatic or rheumatoid affections; (3) that alteration of the condition of the peri-articular tissues which is often seen with an impaired condition in the nutrition of the synovial surfaces and with the exaggerated sensitiveness which is observed in the neurasthenic or so-called hysterical joint. It may be said of the last of these that fixation is the method to be used most sparingly of all methods of treatment in cases of this class.

Tubercular processes may, and frequently do, follow violence. The well-known experiments of Schuller demonstrate this fact beyond doubt; and yet, pathological evidence would show that in healthy adults without tubercular history, the danger of tubercular osteitis or synovitis following an injury, is so slight as to be disregarded — in the same way that the danger of typhoid fever following the ordinary exposure to cold is so slight as not to disturb the judgment of any physician in advising his patient.

The tubercular processes develop, as is now known, only where the requisite diathesis is present, and are more frequently seen in children than in adults, for the reason that well-organized and solidified bone resists the invasion of the tubercular bacillus, which attacks, in adults with a predisposition, the lungs rather than bone.

No physician, therefore, would be justified in pursuing an overcautious treatment in a sprain of the ankle, in the fear of tubercular osteitis — that is to say, caries — in a healthy adult who has sustained an injury.

This is even more true of rheumatic or rheumatoid processes, there being no positive evidence whatever that the rheumatoid, that is constitutional processes are ever caused by injury, although they may be aggravated by violence. The same is, of course, true of the semi-septic processes which are manifested in puerperal synovitis.

This suggests the query as to what lesion is found in a sprain. The inquiry may, for brevity, be limited to the knee- and ankle-joint, as being the parts chiefly exposed to sprains, and also as being the most important joints. Sprains of the hips are chiefly contusions, and are not to be classified in the same category. If a dissected ankle be examined and submitted to a violent twist, it will be seen that the forced motion causes a strain upon the ligaments and the tendons, chiefly of the medio-tarsal joint, and that contusion of the bone itself is not the rule.

In sprains, the weight ordinarily is thrown upon the forcibly inverted foot or the forcibly everted foot. In some instances the foot may be forcibly flexed or extended. In the latter instance, although the astragalus is involved in the motion, the strain falls upon the ligaments and tendons of the fore part of the foot.

The astragalus in its articulation with the tibia and fibula is so thoroughly mortised, and the os calcis is so well protected by the deltoid and astragalo-calcoid ligament, almost the strongest of the body, that displacement is not to be anticipated except in the severer injuries.

It will be seen on examining a dissected foot that the medio-tarsal articulation is capable of quite free movement if it were not for the ligamentous checks, and that in a severe fall or twist, or other violent injury, the parts which would suffer would be chiefly, as has been mentioned, the ligaments and synovial sheaths, as well as the ligamentous fibres and attachments of muscles. With the exception of such violence as would cause fracture, it is demonstrable that a complete rupture of the ligaments is not to be expected in the ordinary accidents which give rise to the condition known as sprains.

The same facts are true, but to a less degree, of the knee-joint. The motions in which a strain is to be anticipated are a lateral force pressing the knee in or out, an exaggerated flexion of the knee, or a twist. Extreme hyper-extension is rarely met, and if of sufficient violence to cause anxiety, would occasion a fracture.

The clinical symptoms which are seen in sprains are as follows: The patient meets with a violent twist or fall. The weight of the body is thrown upon the joint which happens to be fixed or placed in such a position that the weight of the body exerts improper leverage, and an unusual strain takes place. The muscles being violently exerted to preserve the equilibrium, the patient suffers extreme pain, and may be faint or be attacked by a fainting sensation; any attempt to use the limb may be either impossible or excessively painful. This is followed by swelling, sensitiveness and discoloration. This condition remains for a comparatively long time. Attempt at walking is painful, and the joint remains in a weakened condition for a long time.

If the parts were dissected at this time, it is probable that there would be found the ruptured capillaries with effusion of blood, effusion of serum, and rupture of some of the ligamentous fibres, and probably also, in some instances, of the fibres of the capsule. An increase of synovial fluid sometimes takes place in the knee, and extravasation of blood. An injury to the cartilages, or extravasation of blood under the cartilage following violence at the ankle not sufficient to fracture, would seem to be, from the anatomical position of the ankle, exceptional.

TREATMENT.

If we accept these statements as correct, it would appear that, with the exception of such support as is necessary to give time for the repair of the few stretched ligamentous fibres, treatment should be directed at first to check the effusion and extravasation.

This can be done in several ways: (1) by compression carried on for a short time; and (2) by such means as would improve the circulation in the peri-articular tissues, namely, the application of heat and cold, massage, and motion of the joint, which, however, should be restricted in character so as to prevent any excess of motion or stretching of the strained ligaments.

The length of time for which it is necessary to protect from extreme motion will vary in any individual

case according to the amount of reparative power, the amount of violence and the age. But there would seem to be no justification for the popular opinion that a sprain is worse than a break, an opinion which would appear to be based upon the over-cautious treatment following such injuries, which, by interfering with the proper circulation of the part and guarded motion, increases the sensitiveness and produces a condition which, if unchecked, may develop a disabled joint, which is more tedious than an ordinary fracture.

This condition is what is occasionally seen in joints which are stiffened simply from disuse, for, as is well known, in limbs which are held stiff in the treatment of fractures, there is more pain and sensitiveness in first attempting to move the uninjured joints which have been fixed in the treatment of the fracture than in the fractured part itself.

The condition following a sprain is somewhat analogous to that seen in the soft parts near the site of fractures, namely, the circulation is interfered with, there is a certain amount of soreness on motion, and the muscles and ligaments are strained. As in the condition which follows the treatment of fractures, a great deal of stiffness of the fixed joints remain, and on any attempt to use the limbs there is pain.

In the treatment of sprains we should not be influenced by what is termed by Verneuil, "anchylophobia." A sprain is not a fracture; at most, it is a tear or a rupture of some of the fibres of certain ligaments. This unites readily. If a tendo-Achillis can be safely moved in a fortnight after tenotomy, certainly a few ruptured or stretched ligamentous fibres should not be regarded as grounds for fixation for a longer time.

The patient's pain is the natural check to an excess of motion.

Fixation by apparatus is only necessary if demanded to stop pain for a short time after a severe sprain.

In the early stages motion within the pain-limit is harmless; in the later stages of a sprain, motion and use should be allowed up to the point of pain; and in some instances in hypersensitive persons guarded and protracted motion, even beyond the point of pain, is indicated.

Compression may be advisable for a short time during what may be termed the period of effusion, after that it becomes injurious.

As means to improve the circulation, applications of heat and cold and rubbing are needed from the first, as well as during the whole treatment; and use of the limb, when permissible through absence of pain, is a natural means of improving circulation and nutrition.

The establishment of a precise diagnosis is of the most importance in sprains. If this is certain, the treatment is clear and simple.

DEFORMITIES OF THE SEPTAL CARTILAGE.

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THE septal cartilage may be considered as roughly triangular in shape, and is commonly known as the triangular cartilage in English text-books. It is held in a bony frame, except along a portion of two of its sides and the angle between them. This free angle carries the tip of the nose (Fig. A). The cartilage is very

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elastic, and has a wonderful power of straightening itself even after extensive injury, but we find it more or less irregular in a very large number of persons.

For convenience these irregularities may be divided into four varieties (Fig. B.); (1) the cartilage, as a whole or in part, may be simply bowed or bent from its perpendicular plane without being broken or thickened; (2) it may have been fractured along one or more lines, forming a sharp bend or angle; (3) it may present a spur or ridge of cartilage projecting from its surface; and (4) it may have been dislocated from one of its bony attachments and united in a new position. Very often more than one of these condi-

FIG. A. — The Nasal Septum.

FIG. B. — Diagrammatic Section of the Septum, through a line represented by the arrow in Fig. A.

tions is found at the same time. Spurs are often found on the convex side of sharp deviations, and more commonly still along the synchondroses of the cartilage with the vomer or the ethmoid, either with or without a certain amount of dislocation.

In order to form some idea of the frequency of these deviations, I have examined the septa of a number of patients in a hospital clinic at random. Of course, as many of these patients came to the hospital for some trouble of the nose, the statistics are of no value as showing the frequency of deviations in the community at large. From one hundred cases a well-marked ridge, in one or both nostrils, was found along the cartilage-vomer synchondrosis in fifty-eight; and along the cartilage-ethmoid in fifty-one. A noticeable bend of the cartilage in some part of its