We can see how every game from the first has a definite effect on the playing of its successors. We learn gradually to attach special meanings to our own set of pieces which we call physical signs in the light of increasing use of the radiological set; we read new values into our films by applying to them these readjusted physical signs; and we add to both a freshened interest in living pathology. In other words, each game is a new experience, instructive, exhilarating, and whetting to the appetite for further and new problems. The number of these is so large that we need never fear that in our short time we shall solve them all; we have games for a lifetime.

TREATMENT OF HALLUX VALGUS DEFORMITY IN SOLDIERS

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A surgeon who has treated with success hallux valgus deformity of the great toe in civilian patients may be disappointed with the results he obtains when similar methods are used in the case of the soldier. Why should there be this difference? There are many possible explanations. One is that usually in civilian life no question of compensation arises in this type of case, and the patient is thus forced by financial necessity to get back to his job as quickly as possible; he will co-operate to the fullest extent in the after-treatment and will make the best of any disability which may remain. In the case of the serving soldier this incentive to get well quickly is absent. He has no financial worries, is usually comfortably housed in an E.M.S. or military hospital, is excused duties, drill, and marching, and yet is not confined to bed and is allowed considerable freedom which he is fit to enjoy. It is not surprising that he takes his time in getting well. He is unenthusiastic, perhaps lazy, and often perhaps completely uninterested in the treatment. This lack of co-operation may lead to a poor result, which soon becomes apparent to the patient, and on occasion he will exploit it to the full. The greatest caution is therefore called for on the part of the surgeon, especially where operative treatment is contemplated. Each case must be considered on its own merits, and those only selected in whom some degree of co-operation may reasonably be expected, after weeding out men who have a grouse against everything—Army life in particular.

An analysis of Army medical categories will show that a man may be placed in Category A1 if he has no foot defects, A2 if he is an A1 man with slight foot defects, C if he would be fit for a higher category but for marked foot defects. The ultimate aim of any form of treatment is threefold: to raise the soldier to a category higher than that in which he is at present; to prevent his being placed in a lower category; and, finally, to prevent his being put in Category E and boarded out of the Army. Even if his ultimate category is not one of the higher ones, treatment will be worth while provided the time taken over it is not too great.

To be eligible for the lowest category, C, he must be capable of carrying out a full day's work in his own arm for continuous periods without going sick. He must be able to wear and march in Army boots. This does not imply that Army boots are an additional burden which he must bear. They may be heavy but they are well designed, and it is not the boots that are in any way at fault. The soldier, it is true, refers all his foot troubles to his Army

boots. He may be boarded Category E because he cannot march in them, but this is only tantamount to saying that no treatment will offer any prospect of his walking in any other than special boots or shoes with reasonable comfort, and probably not even in these. It may perhaps be that through an error of judgment or an accident the treatment attempted has failed in its object, or was possibly unsound in its conception and under war conditions should never have been attempted.

A man working in a sedentary occupation in civil life may for many years carry on in comfort by wearing shoes, only to find that his feet will not stand up to the strain of wearing Army boots. The Army, for self-evident reasons, does not make an issue of shoes. Men who by wearing shoes could be employed in clerical or administrative duties are thus lost to the Service. Special boots, and even such appliances as arch supports, may be obtained in isolated cases, but the formalities connected with their issue are so great that, in practice, attention is confined to an attempt, by palliative measures such as foot drill and massage, and in selected cases operative treatment, to make the patients well enough to wear the ordinary boots supplied without these additions.

Palliative Treatment

In soldiers, in most cases, the deformity is of the acquired type and is moderate in degree, so that much can be done by well-planned and graduated active exercises, with preliminary thermotherapy, and faradism to the invertors of the foot and intrinsic muscles, which are also at fault. Active exercises may be taught to music, and it is an advantage to group patients together into classes for this purpose. Newcomers are encouraged by the progress which they see in others. A course of daily active foot-exercise classes will last for twenty-one days, and the less severe cases may have recovered sufficiently at the end of that time to return to their units. These are, however, long-term cases, and more than one course may be necessary to tide the patient over the period of foot-strain due to the sudden change from a sedentary occupation to an active Army life.

Operative Treatment

The patient is a young man and, speaking generally, the deformity is not in its advanced stages and arthritic changes have not yet supervened. There is a well-marked bunion, an outwardly overriding or underriding great toe, a varying degree of stiffness and pain, and an associated dropping of the anterior arch. The deformity is fixed, and cannot be corrected by passive movement. Operative removal of the bunion will ease the pressure of the boot on the tender and sometimes inflamed soft tissues and, followed by a short course of physiotherapy, may be all that is required to enable the man to return to duty and to wear Army boots with comfort.

Such an operation does not correct the valgus deformity of the great toe; nor, for that matter, do arthroplasties, in which the metatarsal head is partly removed and reshaped or the base of the proximal phalanx removed. Only in older patients with arthritic and painful joints are these operations of Mayo and Brande justifiable—the exception rather than the rule in soldiers—and the most that can be hoped for is that by removing enough bone the joint will be rendered flail and painless. The great toe ceases to act as a lever and is carried as a useless appendage. Failure to remove enough bone gives a painful and stiff joint—rather worse, if anything, than it was before. In both these instances the toe will be shortened but the valgus deformity will persist. It is difficult to understand why so much is expected from an arthroplasty of this important weight-bearing joint when the results of arthroplasties in other

weight-bearing joints, except in the hands of a few, are on the whole so indifferent. It is certain that, in general, such radical operations have no place in the treatment of hallux valgus deformity in the soldier. Apart from the removal of the bunion already mentioned, the less the bone is interfered with the better. If the deformity is fixed, and cannot be corrected by palliative measures alone, operative treatment should be confined to the soft tissues. Some form of tendon-reposition operation, combined with a capsulotomy of the outer contracted part of the capsule of the metatarso-phalangeal joint, such as Silver and McBride's operation, is all that should be attempted.

Tendon-reposition Operation

The valgus position of the great toe is maintained by the contracted parts of the capsule and ligaments on the outer side of the metatarso-phalangeal joint by the pull of the outwardly displaced tendon of the extensor hallucis longus

FIG. 1.—A Z-shaped incision is made in the tendon of the extensor hallucis longus. The abductor hallucis is exposed, and is incised near its anterior border.

and by the pull of the innermost tendon of the extensor brevis digitorum passing to the great toe, and, to a lesser degree, by the adductor hallucis muscle. The long flexor tendon is not an important factor, for it is retained in its correct axis by the groove between the two sesamoid bones, and thus the direction of its pull is not altered.

The capsule of the metatarso-phalangeal joint may be exposed through a three-inch vertical incision to the inner side of the extensor hallucis longus tendon, and the soft tissues separated from it round to the outer aspect. Here an incision, half an inch in length and vertical to the long axis of the toe, may be made from the contracted capsule down to bone, when the toe may at once be placed in the over-corrected varus position with the greatest of ease. No attempt should be made to sew up the gap in the capsule thus formed. The tendon of the extensor hallucis longus muscle is next exposed for a distance of three inches down to its insertion and divided by vertical and horizontal incisions as in a tendon-lengthening operation. By retracting backwards the inner margin of the incision the inner part of the abductor hallucis, which in this region is partly muscular and partly tendinous, comes into view. The tendinous portion is traced downwards to its attachment to the inner sesamoid bone, and is then incised horizontally over a distance of one and a half inches, rather nearer the anterior than the posterior margin of the tendon. The

smaller anterior portion of the muscle and tendon can then be pulled forward, and will form a loop through which the divided extensor hallucis longus is threaded from deep to superficial aspect, put on the stretch in the over-corrected varus position, and sewn again to the proximal end with three or four interrupted stitches of fine silkworm-gut (Figs. 1 and 2). The innermost tendon of the extensor digitorum brevis is divided and the wound closed.

The toe is splinted by a small wooden splint (half a wooden tongue depressor serves well for this purpose) placed along the inner margin of the great toe and fixed first to the toe and then to the foot by two pieces of narrow strapping. On the fifth day the patient begins to walk with the splint *in situ*. On the tenth day active exercises are begun, and from that time the patient walks barefoot, both indoors and out. The splints are worn continuously for four weeks

FIG. 2.—The capsule on the outer side of the joint is incised vertically. The tendon of the extensor hallucis longus is passed through the slit made in the abductor hallucis muscle from deep to superficial aspect, and sewn again to its peripheral end by three interrupted stitches.

and are removed only for remedial exercise treatment. For a further three weeks they are worn at night only.

The power of active adduction and dorsiflexion of the great toe returns rapidly, and in from five to six weeks from the date of the operation the patient is walking without pain and without a limp, and is fit to rejoin his unit.

Conclusions

If operative treatment of hallux valgus deformity in soldiers is contemplated, only those cases likely to co-operate in the post-operative treatment should be selected.

The patients are young, and much more can be done with palliative treatment alone than is the case in civil life.

Bony operations involving removal of the base of the first phalanx or partial removal of the head of the metatarsal bone are best avoided.

An operation of tendon reposition with division of the contracted capsule of the joint is described.

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