Osteotomy

An osteotomy is seldom necessary. It is carried out, however, in two circumstances:

(a) *For the Child who is Resistant to Treatment.*—These patients are generally over the age of 10, with a neglected deformity and 4 in. (10 cm.) of intermalleolar separation. The osteotomy is performed through a window in a bilateral plaster-of-Paris spica. A line is drawn on the anterior surface of the plaster through the long axis of the limb, an angle being made at the site of the proposed osteotomy. The operation is carried out from the outer side, the plaster first having been cut through two-thirds of its circumference, the inner third remaining intact. The plaster is straightened until the angle no longer exists and the thigh and the shin make a straight line. The plaster is then completed. By this method the possibility of gross displacement of fragments is minimized and a meticulously perfect position is assured.

(b) *For Osteo-arthritis in Patients over the Age of 40.*—Knock-knees become arthritic, and this is a point which should be stressed to mothers who are reluctant to have their children's shoes wedged and who consider the application of night splints tiresome and unnecessary. Osteo-arthritis occurs because the outer side of the joint is taking all the weight and the inner side is comparatively idle. In an adult the osteotomy is carried out by linear cuts with an electric saw through the femur just above the knee, and the femur is moulded into the position of correction. I have performed three osteotomies for osteo-arthritis due to excessive knock-knee in patients over the age of 50, with relief of pain and apparently good function.

McMurray suggests an osteotomy through the tibia. Of this I have no experience. Nevertheless I would hesitate to perform a high tibial osteotomy nowadays because of my experience of occasional severe vascular complications after fractures in this region.

The following table gives a working basis for treatment.

2 in. (5 cm.) G.V. below age of 4	Wedge sole and heel only
2 in. G.V. above age of 4	Wedge sole and heel; night splints
More than 2 in. G.V. below age of 4	Wedge sole and heel; night splints
More than 2 in. G.V. above age of 5	Wedge sole and heel; Lloyd's night splints
4 in. (10 cm.) G.V. above age of 7	Osteotomy

This plan may require modification when deformity increases in spite of these conservative measures. That occurs but rarely, and when it does I carry out an osteotomy at an earlier age.

During a recent visit to America I was impressed by the intermediate results of stapling—i.e., the application of staples to control the growth of the lower end of the femur (Blount, 1944). This appears to be a simple, tidy method, less tedious than the prolonged wearing of wedged shoes and night splints, and seems to have a definite place in the treatment of children aged 14–15, in whom shoes have little corrective action and in whom there may be intolerance of night splints. This treatment is, however, *sub judice*.

Conclusions

The psychological effect of knock-knee irons is bad. This is one of the reasons, and an important one, why they should not be used in the treatment of genu valgum.

Genu valgum is seldom caused by rickets. In a large proportion of patients it is due to laxity of ligaments, to quadriceps insufficiency, and to the child being overweight.

Wedged shoes and night splints are sufficient treatment in the majority of cases. Occasionally a supracondylar osteotomy of the femur is desirable in both children and adults.

I wish to thank Mr. Eric I. Lloyd and the Editor of the *British Medical Journal*, by whose permission the illustrations are reproduced. The makers of the splints are Messrs. Beckett and Bird, Bentinck Street, W.1.

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A CASE OF SKIN SENSITIZATION TO STREPTOMYCIN

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The use of streptomycin is restricted at present in this country. The drug is soon to be produced in greater quantities, however, and the time is not long distant when it will become generally available and in common use. It is considered of interest, therefore, to publish details of the following case of sensitization to streptomycin.

Case History

Sister R. W. had had the care of six cases of tuberculous meningitis for four months, during the whole of which time she gave about 40 intramuscular injections of streptomycin a week. The strength of the solution varied between 200 and 500 mg. per ml. and at each injection some soiling of the fingers and hands with the solution was almost unavoidable. At no time did she wear protective rubber gloves.

She was well and did not complain of symptoms during the first three months of exposure, but after this period there was some irritation at night. The little and ring fingers of the right hand and the web between these two fingers were first affected. Two weeks later a similar irritation was noticed on the left hand. At about the same time an eruption suddenly appeared in the flexures of both elbows, and swelling and itching of both eyelids became apparent. There was some rhinitis with a thin watery discharge, and the patient felt generally unwell, but there was no fever.

On examination the contiguous and dorsal surfaces of the little and ring fingers of both hands showed thickening of the skin, with superficial desquamation and fissuring, and there was a slight serous discharge from the lesion. The skin of the web of the affected fingers was reddened, with pin-point papules and a few minute colourless vesicles, some of which had ruptured and discharged a little fluid. A similar fine papular and vesicular eruption affected the flexures of both elbows over an area of 6 by 4 in. (15 by 10 cm.). The skin of the eyelids was oedematous, dusky in colour, and showed a fine desquamation. Nothing further abnormal was discovered on full routine examination.

Patch-testing

Patch tests on the patient and all other members of the nursing staff handling streptomycin were carried out in the following way: 0.2 ml. of 1:5 solution of streptomycin calcium chloride complex (Merck), containing 1 g. of active base in 1.3 g. of substance, was used, drawn from the same batch of drug as is in current use in the treatment of cases in this centre. Sterile water was the solvent. The solution was spread on a single layer of gauze 1 in. (2.5 cm.) square, and the whole was covered with a piece of jaconet, which was held in place with zinc-oxide plaster. A control patch consisting of gauze, jaconet, and plaster was used in each case. The skin was not cleaned as a preliminary. The patch was left in place for 24 hours, and the area was examined at the time of its removal and 24 and 48 hours later.

The patient and seven other nurses who had administered the drug for periods of between one and a half and five months were thus observed. A control group of seven volunteers who had not been in contact with the drug were also tested. In all

cases save that of the patient both the patch and the control were negative. In the patient, at the end of 24 hours an erythematous eruption at the site was apparent, which later became oedematous and itched. The original skin lesions, which had by then almost disappeared following withdrawal from contact with the drug, showed a simultaneous exacerbation. Further patch tests were carried out with solutions of 1:10, 1:50, 1:100, 1:500, and 1:1,000. With the solutions of 1:10 and 1:50 a similar oedematous and erythematous lesion was observed at the site at the end of the examination period, and there was a similar exacerbation of the clinical manifestations in the original skin lesions. A papular erythematous eruption was seen with the weaker solutions, the lesion being minimal in the test to 1:1,000, and no general reaction was experienced. All the control patches were negative.

Discussion

Strauss and Warring (1947) reported four similar cases among 12 nurses in contact with streptomycin. One developed symptoms after a month, whereas the other three required approximately three months' exposure before any changes were noticed. In all cases the eruption first showed upon the fingers, in two the flexures of the elbow were affected, and changes in the eyelids were noted in all four. The clinical development, the pattern of reaction, and the type of the eruption were strikingly similar to that in the present case. By patch-testing they detected two further cases of sensitization which had not hitherto shown clinical manifestations. They were able to patch-test their sensitized cases with a solution containing only 2% of impurities, and induced a similar lesion to that produced by a solution with as high a proportion of impurities as was used by ourselves. They conclude, therefore, that the sensitization is probably not due to the presence of impurities. For lack of material it was not possible to confirm their findings.

Crofton and Foreman (1948) described four cases of sensitization to streptomycin, the nurses concerned having been exposed to the drug for periods of between six weeks and six months. Oedema and itching of the eyes occurred in three of them, whilst in two cases the skin of the face was involved. The eruption on the hands and arms was similar to that in the present case. They carried out skin tests, using intradermal injections of 50 μ g. of streptomycin hydrochloride dissolved in 0.1 ml. of saline. Positive results were obtained in all four cases, and exacerbation of the original skin lesions occurred in three. The authors failed to detect similar skin sensitization in 30 other nurses who had been exposed to the drug.

The absence of reaction to a 1:5 solution in the other exposed personnel and the control volunteers in the present investigation suggests that the solution is not a primary irritant and that this eruption is a sensitization phenomenon. Considering the long period of exposure required before clinical signs become manifest, it seems reasonable to suppose that this sensitization is acquired. Further work is in progress in an attempt to elucidate this point.

Summary

A case of skin sensitization to streptomycin in a nursing sister is reported.

Patch-testing of seven other exposed nurses failed to detect further sensitized cases.

Negative patch-tests in a control group suggest that the drug is unlikely to be a primary irritant.

It is considered probable that the sensitization is acquired.

My thanks are due to members of the Leeds Streptomycin Committee for their helpful advice and their permission to publish this case.

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Medical Memoranda

Gangrene after Scorpion Sting

Scorpion sting causes pain and discomfort of only short duration and serious complications do not usually occur, though slight local necrosis has been seen in some cases. In rare cases, however, especially in children, death has been reported. In the following case gangrene of a finger occurred after a scorpion sting.

CASE REPORT

On Feb. 13, 1947, a young healthy girl of about 17 was stung on the pulp of the right ring-finger by a scorpion which was found and killed. This was followed immediately by the usual symptoms—namely, burning pain, tenderness, and swelling at the site of the sting and cold perspiration of the whole body. A few minutes later a blister appeared just proximal to the point of the sting and it soon spread to and round the middle of the second phalanx of the finger. Potassium permanganate crystals were applied to the point of the sting and a starch poultice to the blister. The latter was applied for about two hours with no effect on the blister, which

burst on the third day, leaving a raw surface underneath. As the tip of the finger was gradually getting dry and black she consulted a doctor on Feb. 22, who advised cleaning the part with spirit and dusting it with "cibazol"—acriflavine powder.

When I first saw her, on March 1, the tip of the finger was dry and black, and proximal to this was a discoloured area which was limited above by a demarcation line. When seen on March 10, the dry black area had extended to the demarcation line (see illustration).

COMMENT

I could not find any reference to the occurrence of gangrene after scorpion sting in the literature on Indian scorpions. Dr. K. S. Mhaskar, joint author of *Indian Medical Research Memoir on Indian Scorpions* (1932, No. 24), writes in a personal letter that he never came across any case of gangrene after scorpion sting. S. Kubota (1918), however, has reported a case in which local necrosis occurred after a sting by a Manchurian scorpion (*Buthus martensi*). Nowak (1898) showed that when injected subcutaneously scorpion venom, like snake venom, may produce local necrosis.

In the above case the gangrene may have been produced by the action of substances applied locally or by the infection of the part. However, the local application of potassium permanganate to the point of the sting and the application of starch poultice to the blister were not such as to give rise to the production of gangrene in the finger. Infection also does not seem to be the causative factor, as the gangrene appeared to be of the dry type from the beginning. The production of gangrene therefore seems to be due to the action of the venom.

The variety of the scorpion concerned is not known, but it seems probable that the venom of a particular variety produces local necrosis. Though the occurrence of gangrene after scorpion sting might not be very common, the disability it causes should call for further research in this field.

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