of the teeth and tonsils has been followed by shock equal to that following a major surgical operation. The patient's resistance has been lowered, and the disease has made rapid progress owing to this. This has happened more often than is realized. It must not be thought that I am opposed to drainage of pus-containing areas; but I do advise caution, and more moderation, because the results have not been successful enough to justify the increased pain and suffering inflicted. The humiliation to the individual of losing all the teeth is considerable. In my opinion it is open to argument whether these so-called septic foci are really primary; it might be claimed that they are just as likely to be manifestations secondary to a general disease, and part and parcel of it. The infection may come from an entirely different source.

Causation of the Disease

Trauma does play some part, more especially in the monarticular disease of the hip or knee. Locality and unhygienic surroundings seem also to have a share in causation. The whole course of the disease, manifested more especially in children, has all the appearance of a sudden infection, and is in favour of germ invasion. I am inclined to discard all other explanations, such as disturbed metabolism, endocrine deficiency, toxæmias of unknown origin, in favour of an infection of unknown character. The explanation, I feel, lies in the bone marrow and the spleen, and further work is required in these regions.

As to whether the improvement that follows bone opening is due to relief of pressure—that is, a decompression—or whether something noxious is released from the part, or something useful is liberated into tissues, I cannot say because I do not know. Various suggestions, such as auto-vaccination, absorption of the patient's own blood which is liberated into tissues, have been made to me, but not by me.

After all, the result is the main thing, and one should not be hampered by ignorance of the causation of the disease or lack of knowledge of the reasons for improvement. My experience is that the patient always wants to know what causes it, and one's own profession wants to know the rationale of the treatment.

An Attempt at Systematization of Results

This has not been of much value owing to the great variation of age and condition in the patients. The types of cases operated upon range from partially helpless to completely helpless, from 10 years of age to 70 years of age.

I found the average duration of disease at time of operation where hip- and knee-joints were involved, either together or separately, was over six years, the duration on the patients' statements ranging from one year to twenty years. Taking the cases right through, an improvement really worth while can be expected in 80 per cent. of cases. Naturally the older the patient the less hopeful is the prognosis.

The number of cases operated on where hip- and knee-joints were involved is 106. Some recent cases are not included, as sufficient time has not elapsed to judge results.

The same line of treatment has been adopted in cases where other regions are affected by osteitis or osteo-arthritis. These cases include conditions such as spondylitis, sacro-iliac diseases, and delayed restoration of function after fractures.

Summary

1. All cases of osteo-arthritis and so-called rheumatoid arthritis belong to the same type of disease, and should be classed as such.

2. The condition in these cases is one of primary osteitis, with secondary arthritis. There is every reason to think that the bone marrow has undergone some disease change.

3. Many cases are improved by the simple procedure of opening the bone in the neighbourhood of the joint affected.

4. Improvement is manifested by relief of pain, improved health and outlook on life, with an improved blood-state. Restoration of function, while slower, does occur.

5. There is reason to think that articular cartilage, unless hopelessly damaged, will recover as a result of the procedure.

6. The progress of the disease is stayed and recurrence is exceptional, and then only in the nature of a slight flare-up, which can be dealt with by local opening of the bone.

7. The procedure is simple, unaccompanied by shock or unfavourable sequelae, and does not call for a long stay in hospital nor for expensive after-treatment.

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MEASLES AND CONVALESCENT SERUM

BY

G. W. ELKINGTON, M.B., M.R.C.P.

An epidemic of measles in a school is usually serious; few escape, and there is a constant dread of complications. The introduction of the use of convalescent serum to prevent or to attenuate the disease does not yet seem to be appreciated as widely as it should, and this description of its effect in a recent epidemic may be of interest.

In September, 1935, in a preparatory school near Malvern, there were ninety-seven boys, of whom fifty-six had not had measles. On the eighteenth day of term a senior boy was diagnosed as a case of measles, his rash appearing the next day. Isolation of contacts was enforced, but in two weeks there were nine cases in different parts of the school. Of the remaining forty-six susceptibles twenty-two were given a small dose of convalescent serum, and most of them were included in the third batch of thirty-nine cases. Six formed the fourth batch, and the last remaining susceptible made the fifth. Thus the attack rate was 100 per cent., and there were none among them with a previous history of measles.

Epidemic in the Unprotected Cases

The thirty-four boys who received no serum went through the usual stages. They lay like logs for three days, ill and miserable, and they all had coughs. As time went on the intensity of the illness became less, the days of fever and prodromal symptoms were reduced, and convalescence was established earlier, but the accompanying bronchitis became worse up to the middle of the main outbreak, after which it diminished. I would emphasize, nevertheless, the severity of the respiratory symptoms in this group. The last few cases appeared to have acquired some protection through having lived in the measles atmosphere. They were mild cases and in severity of symptoms compare with those who had received a small dose of serum. But one boy who arrived in the school on November 10th fell ill on the 19th, and was the worst case in the last batch.

Serum Technique

When it became obvious that isolation had failed, the boys' parents were requested to send convalescent serum if they wished their sons to be inoculated, and in five cases they did so. A supply was obtained from the London Fever Hospital sufficient for seventeen others, and so altogether twenty-two cases received this treatment.

Various authorities differ as to the interval which should elapse between exposure and inoculation, but in a school the exact date of exposure is uncertain in a large number of cases. The inoculation of 5 c.cm. of convalescent serum into the buttock was carried out on these twenty-two cases between October 29th and November 1st. This aimed at giving inoculation or rather attenuation doses on the fifth day after the appearance of the rashes in the second batch. I think this was too early, but the results were satisfactory. There were no serum reactions.

Epidemic in the

The first of these cases occurred four days after inoculation, and had a modified rash and no cough. The boy was not very ill, but more so than the later cases. Most of the others came about twelve days after inoculation. The most remarkable thing was the complete absence of toxæmia and cough, and they were throughout bright and cheerful, in striking contrast to other unprotected cases in the same room. On two occasions boys with temperatures of 104° F. had to be reprimanded for being too high-spirited. The rashes were well marked, and the high fever was confined to one day. In some cases there was a delay in the appearance of the rash, and the prodromal and incubation periods seemed to be lengthened. The explosive character of the rash was noted in two cases, but that also occurred in the later cases of the unprotected group. One boy received 25 c.cm. of adult serum, but he had quite a sharp attack with some colitis and adenitis. It transpired that the donor had never had measles.

Complications and Sequelæ

In the unprotected all had a certain amount of bronchitis, and there was one bronchopneumonia; two other cases had albuminuria a month later. There were no coughs in the serum-protected, and no albuminuria. There was an interesting coincidence in the development of acute appendicitis in two boys at the same time on the day their rashes appeared. The first boy, who had not received serum, was too ill to stand an operation owing to a severe bronchitis, and several anxious days were passed before the condition subsided and his chest cleared. Later operation proved that the appendix had been on the point of perforation. The other boy had been serum-protected, and the operation was proceeded with and a gangrenous appendix removed with chloroform anaesthesia. He had no cough, nor did his condition cause anxiety at any time. These two gave no history of previous abdominal trouble, but, nevertheless, I thought the appendicular conditions were of old standing and were lit up by the fever.

General Comparisons

To judge the effect of the serum thirteen serum-protected boys were compared with the same number of ordinary cases, all from the third batch. Owing to the diminishing intensity of the measles as the epidemic progressed it was necessary to take cases which fell ill at the same time. These unprotected cases had 1.7 days of fever of 103° F. and over, taken orally, and by the end of the term their average loss in weight was 1.17 lb. The

serum-protected cases had 0.5 day of 103° F. and over, and only lost an average of 0.33 lb. This is a valuable indication of how much protection was afforded by the small dose of 5 c.cm.

The table shows the variations in weight in the serum-protected, non-protected, and the control group during the measles period, during the whole term, and also from the beginning of the Autumn to the Easter term. The fallacies of weight records are too well known to need comment, but the table does show two facts—the relatively small loss of weight in the serum-protected, and in the later and longer period the fact that the non-protected rapidly regained an average weight.

Average per Boy	Measles Group: Third Batch of Epidemic		No Measles Control Groups:	
	No Serum	Serum	1935	1934
Age in group ...	10 yrs. 8 mos.	10 yrs. 1 mo.	10 yrs. 4 mos.	10 yrs. 6 mos.
Days of 103° plus ...	1.7	0.5	—	—
Loss in weight: measles period (fifth to tenth week of term) ...	1.17 lb.	0.33 lb.	—	—
Gain in weight: First to twelfth week ...	0.48 lb.	1.23 lb.	2.15 lb.	2.02 lb.
September, 1935, to Jan. 22nd ...	2.21 lb.	2.13 lb.	2.43 lb.	1.71 lb.

Two incidence charts are given: one shows the day on which each boy fell ill, and the other is worked out for the day the rash appeared. These demonstrate that the latter provides a more accurate map of the epidemic. Cases 4, 5, and 6 fell ill on October 23rd, 24th, and 25th, but all produced their rashes on the 28th. Case 51, who had his first day of temperature on November 14th, producing a rash the same day, comes into the third batch of cases in the lower chart, whereas the cases on either side of him in the upper chart later formed the fourth batch.

Incidence charts. The term commenced on September 25th. Shaded squares indicate ordinary cases, and white squares serum-protected cases.

Conclusion

With forty boys in bed at one time the nursing duties were heavy, but were lightened considerably by the serum protection. As is often the case during a measles epidemic, all other minor ailments disappeared from the rest of the school. The dose of 5 c.cm. is small, but produced the desired effect, and I believe an even smaller dose would have given the required result. After all, we were aiming at providing what nature gave to those who were lucky enough to survive the first three batches. The first and possibly the second we can do nothing for, and these, though severe, usually make a normal recovery, but time after time experience proves that the worst complications occur in the third batch. This was so in this

epidemic, especially as regards bronchitis, and we are now armed with a powerful weapon to ward off these complications. The supply is scarce, and every chance should be taken to supplement it. It would seem that the best time to take the blood is two weeks after the temperature has fallen. Most fever hospitals will supply collecting outfits and carry out any necessary tests on the blood when received, and they welcome any addition to their stock.

Summary

1. An epidemic is described with an attack rate of 100 per cent.
2. Attenuation was obtained by 5 c.cm. of convalescent serum in twenty-one cases, and an entire absence of cough and toxæmia resulted.
3. Appendicitis and albuminuria occurred as complications in the non-protected cases.

NEEDLES IN FEET

A METHOD OF REMOVAL IN DIFFICULT CASES

BY

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Attempts to remove a needle from a foot or hand have humbled many a young surgeon who light-heartedly embarked on this procedure in the casualty department without a tourniquet or a general anaesthetic, but with a

wires. An incision is then made which will give the best approach. The wires are left in position until the foreign body has been extracted and they are then removed.

Case I (Fig. 1)

A man of 73 (referred to me by Dr. M. Coburn) had run a needle into the heel of his left foot forty years previously. There had been no serious trouble from it until three weeks before I saw him, but during those three weeks he had so much pain that he walked on his toes to spare the heel. At operation the fragment, half a centimetre long, was easily found by the aid of two Kirschner wires and radiography. It was partially embedded in the under surface of the os calcis, and the projecting end had been the source of the pain.

Case II (Fig. 2)

A youth aged 18 had run a needle into his right heel three months previously, and had undergone two unsuccessful operations for removal. By means of two Kirschner wires and x -ray control a fragment of needle, two and a half centimetres in length, was found and removed.

Case III (Figs. 3 and 4)

A boy of 14 had run a needle into his foot, and an unsuccessful attempt had been made to remove the fragment. Six weeks later it was easily located and removed by the two-Kirschner-wire method under x -ray control.

The following points should be noted:

1. Reopening a recent operation wound is a frequent cause of sepsis in these cases. It is probably wiser to work through a fresh clean incision or to wait some weeks after the last operation, or both.

FIG. 1.

FIG. 2.

F.B. = Needle fragment. W1 = Kirschner wire in sagittal plane. W2 = Kirschner wire in coronal plane.

FIG. 3.

FIG. 4.

little novocain and a lot of hope. The author, when a house-surgeon, soon learned that it was wiser to admit these patients to the ward in the expectation of somebody else having to do the operation. Nowadays a shock-proof portable x -ray apparatus ought to be available in every theatre, and it is partly in the hope of speeding on the millennium that these three cases are recorded.

In each instance there had been at least one previous attempt at removal of the fragment, and in Case I it had been undisturbed for forty years and was partly embedded in the os calcis. By the simple method about to be described, however, the three cases were each dealt with at one sitting and the fragment successfully extracted.

The operation is performed under general anaesthesia and a tourniquet. Two fine Kirschner wires are passed through the foot at right angles to one another and in such a way that they cross close to the foreign body. Next an x -ray photograph is taken in two planes, and the foreign body thus localized in relation to the two

2. A Michel's clip should be placed on one Kirschner wire near the skin to facilitate interpretation of the skiagram.

3. Although x -ray photography takes a little longer than screening, it is probably the better method in these cases.

The tenth Congress of the German Society of Tropical Medicine will be held on June 2nd and 3rd in the Institut für Schiffs- und Tropenhygiene, Hamburg. The main subjects for discussion will be sequels of malaria in the war, amoebic dysentery and its sequels, yellow fever, and the present position and future prospects of research. Notifications of papers to be read should reach Professor Nocht, Bernhard Nochtstrasse 74, Hamburg 4, before May 1st. The monthly organ of this society entered its fortieth year on January 1st, and will be entitled henceforth the *Archiv für Schiffs- und Tropenhygiene*. Professor Nocht contributes a preface to the first issue of the new volume, indicating the new developments which are contemplated.