indirect inguinal hernia. At operation the condition conformed in every way to that in Case 1, and it was treated in the same manner, except that silk was used to repair the hole in the transversalis fascia, and a silk darning repair made of the inguinal canal. His recovery was uninterrupted.

A diagrammatic drawing of the condition described. No attempt has been made to illustrate the bladder that forms part of the medial wall of the sac. The epigastric vessels are exaggerated in size and clarity in order to point out their relation to the sac.

Discussion

The facts that emerge from a study of these cases are important, and raise points of interest with regard to their anatomy, the type of sac, and their treatment.

In the common type of direct hernia nothing more is usually found than a diffuse bulge of the posterior wall of the inguinal canal, often emerging through the external ring, but possessing no definite peritoneal sac and rarely if ever strangulating. The aetiology is usually quite clear, and represents a weakness of the muscles in that region, often due to advancing age, and occasionally secondary to bowel or urinary obstruction. In the rare type described here the inguinal canal is normal in all respects except for a localized opening in the transversalis fascia with quite definite edges, and in the cases reported would not admit more than the tip of the index finger. As Ogilvie points out, the aetiology of this condition is not clear, and from a study of so few cases it is impossible even to hazard a guess, but it seems certain that the peritoneal sac has arisen secondarily to the hole in the transversalis fascia. In two cases bladder formed a considerable part of the sac, and in one case actual strangulation had occurred. In all cases a definite tubular peritoneal sac was found which had to be dissected from its surroundings and ligatured as in an indirect hernia. Furthermore, they were all diagnosed as indirect herniae before operation; and, indeed, they are indistinguishable.

With regard to treatment, it is important to recognize this type of hernia, which can only be done at operation. The significance of this is borne out by Case 3, for it is possible that the true state of affairs was not recognized at the original operation, and that the diagnosed indirect hernia was really the direct one found at the second operation.

The bladder often forms a part of the sac and must, if possible, be stripped off from it. More important, though, is the repair. It is apparent that, whatever type of repair is done on the inguinal canal, unless a direct attack is made on the opening in the transversalis fascia recurrence is apt to occur. In my own particular cases the opening was closed with catgut in two, and silk in the third. In the case which was strangulated no repair of the

inguinal canal was made, but a full repair was effected in the other two, using silk in one and strips of external oblique aponeurosis in the other. None has recurred.

My thanks are due to Mr. Lancelot Bromley for permission to publish the notes of Cases 1 and 2. Case 3 was admitted under Mr. W. H. Ogilvie, and I am also indebted to him for suggesting the publication of this article and for his help and criticism.

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THE TRANSMISSION OF SYPHILIS BY BLOOD TRANSFUSION

BY

J. A. W. McCLUSKIE, M.B., Ch.B., F.R.F.P.S.

*Lecturer in Venereal Diseases, Glasgow University;
Physician, Out-patient Dept. V.D., Western Infirmary;
Physician, Glasgow Women's Hospital*

In view of the rapidly increasing frequency of blood transfusion as a therapeutic measure in a widening variety of conditions, a recent experience has convinced me that it would not be untimely to draw attention to the attendant risk of transmission of syphilis by blood transfusion, even when all ordinary precautions such as clinical and serological investigation of the donor have been scrupulously carried out.

Historical Survey

The view that syphilis is transmissible by blood transfusion has long been accepted, chiefly on the basis of animal experiments. A review of the literature also indicates that well-authenticated examples of transmission in man have been fairly frequently recorded, there being some seventy cases since the first description by Fordyce in 1915. It is curious, however, that no cases have been hitherto reported in Britain. Several analyses of cases of syphilis following transfusion of blood by American and Continental workers (Morgan, 1935; Klauder and Butterworth, 1937; and others) show that almost all the infections occurred when the donors were in the primary or secondary stage of the disease. Indeed, McNamara (1925), from his own experience, goes so far as to state that infection during the tertiary stages does not occur even though the Wassermann reaction of the blood is positive.

From these observations one would conclude that with ordinary precautions in the way of clinical and serological examination of the donors the risk of infection could easily be avoided. Unfortunately this is not so: undoubted infection has been recorded with blood from donors who were in the pre-chancere stage, and to this fact I wish particularly to draw attention. An analysis of available published histories reveals that in at least two instances infection was transmitted from donors in the incubation stage before the primary sore had appeared, and I now add a third case in which the facts are established beyond dispute. There have been several others in which the history was suggestive but the evidence was incomplete (Brem, 1923; Levy and Ginsburg, 1927; Feldman, 1928; and Dufour, 1929).

Cases of Transfusion Syphilis

The following are the fully authenticated cases:

CASE 1 (POST AND COONEY, 1933)

A girl aged 14 was admitted to hospital with a grave septicaemia arising from a furuncle on the lip. Blood culture

yielded a pure growth of *Staphylococcus albus*. She was transfused with 500 c.cm. of blood from her brother. She made a good recovery from the septicaemia, but four months later was readmitted to hospital with acute generalized secondary syphilis. The Wassermann reaction was positive, but there was no sign of a primary lesion, and the hymen was intact. The donor was then investigated, and it was found that a penile chancre had appeared four to five days after he had given the blood for transfusion. He had since received anti-syphilitic treatment. It is of interest to note that the recipient's blood was negative to the Wassermann test on two occasions shortly after the transfusion.

CASE II (PAUTRIER, 1936)

This patient, who showed a typical secondary rash, denied exposure to infection, and careful examination revealed no sign of a primary lesion. It was learned that he had been treated some months before by blood transfusions for severe anaemia. The donor was a student of medicine, one of a team of donors, who had been under strict serological control and reacted negatively to all the usual tests. One week after the last transfusion and ten days after the last blood test a sore appeared on the tip of his tongue in which *Treponema pallidum* was found. The various serological reactions at this stage were negative and, since treatment was instituted immediately diagnosis was made, they remained so.

CASE III (MY CASE)

A married woman aged 25 was admitted to the maternity wards on June 16, 1937. She had old-standing tuberculous disease of the right hip-joint which, though healed, had left the thigh so adducted that spontaneous delivery was impossible. Labour began on June 19, and Caesarean section was performed. The baby was healthy. The Wassermann reaction of the mother's blood, which was tested as a routine on June 23, was negative, and she showed no clinical signs of syphilis. She developed a low-grade septicaemia with a severe anaemia, and for this reason was transfused with 800 c.cm. of her brother's blood on July 2. Clinical examination of the donor on this date showed no evidence of disease, and his blood gave a negative Wassermann reaction. The patient's blood was also tested again at this time and was negative. She was discharged well on July 24.

On July 13 the donor attended the outdoor clinic for venereal diseases. He gave a history of exposure to infection five to six weeks previously, and had several very small sores round the coronal sulcus, which he said had been present for four to five days. The edges of the sores were raised, the bases granular, and numerous *Tr. pallidum* were found in the exudate. At that time the inguinal glands were slightly shotty, particularly on the left side, but there was no other sign of the infection. The Wassermann reaction on that date was "doubtful." At this time, also, he had definite though slight jaundice. Unfortunately not until the beginning of September did he volunteer any statement as to his having acted as a blood donor, and valuable time was thus lost. The sister who received the blood was immediately sent for (September 11). She stated that shortly after dismissal from hospital she had developed fairly severe jaundice, which lasted for about a month. There was now no evidence of jaundice, and the urine was free from bile. She had, however, a few scaly coppery spots on the arms and a very slight general adenitis. No sign of a primary lesion was present anywhere. The Wassermann reaction of the blood was strongly positive; treatment was therefore begun at once. In view of her history of jaundice, arsenical treatment was given carefully. She had 3.6 grammes of neosalvarsan and 2 grammes of bismuth metal in three months. The Wassermann reaction of the blood was then negative. Another course of 4 grammes of neosalvarsan was given without any untoward reaction, and the Wassermann reaction has remained negative ever since, under very moderate treatment.

The donor, who still had some signs of jaundice when his treatment was begun, became very yellow and there was definite hepatitis. Campolon injections were given, and after four weeks he had recovered. From July 13 till September 2

he had had only 0.9 gramme of neosalvarsan, yet the Wassermann reaction of the blood was negative. He then received a fairly full course of treatment—5 grammes of neosalvarsan in three months—and thereafter the Wassermann reaction was returned as doubtful. He has been treated intermittently since and is now well, with a negative Wassermann reaction in the blood.

Case III presents several interesting features: (1) The disease in the patient had not declared itself two months after transfusion, unless the few reddish macules on the arm were early secondary manifestations—syphilis d'emblée. (2) In both the donor and the recipient the disease responded to relatively small doses of arsenic and bismuth. (3) The Wassermann reactions of the donor and the patient were both tested at the time of the transfusion and were negative; and neither presented any sign of the disease. (4) The donor developed jaundice very shortly after giving the blood, and the recipient two weeks after transfusion.

Discussion

From the three foregoing cases it is clear that syphilis can be transmitted from donors who are clinically and serologically negative. It is therefore of great importance that this fact should be explained to prospective donors, so that, by careful questioning, one may be able to rule out those who have been exposed to infection during the preceding two months. In this country, where most of the donors are volunteers, it is unlikely that any would wilfully risk the possibility of passing on the disease.

It has been suggested that the greatest safeguard against such accidental transmission of syphilis would be to employ cadaver blood obtained according to the technique of Yudin (1936). Blood is taken only from cases where full post-mortem examination and the history and negative serological reactions have all united to exclude the presence of the disease. Apart from the natural prejudice which the general public in this country might have to the practice, it would only be possible when conducted on a large scale with considerable laboratory facilities.

It may in the future be practicable to add some innocuous antiseptic—for example, acriflavine—to the blood for a sufficient period before transfusion to ensure sterility. In some emergency cases in which there has been a doubt as to the possibility of latent syphilis in the donor I have added a small dose of neosalvarsan (0.45 gramme) to the transfused blood with no untoward effect. These measures were purely empirical, and I have no proof of their efficacy.

It should be remembered that in addition to the risk to the patient there is the possibility of an action for damages against the doctor who transmits syphilis by transfusion. Several legal actions of this kind have already taken place in America, and Stokes (1938) has said in a discussion on the subject that "the damage suit is a great educator." We must endeavour to avoid that form of education.

Summary

No case of "transfusion syphilis" has been traced in the literature of this country, though many have been reported by American and Continental writers.

In most of the reported cases the donors were in the primary or secondary stage of syphilis.

Two cases have been recorded, to which I have added a third, of the transmission of syphilis from a donor in the earliest or pre-chancre stage, when the clinical and serological examination was entirely negative.

The importance of this possibility is emphasized not only for the patient but also for the doctor.

The risk of syphilis transmission by blood transfusion could be minimized by the use of cadaver blood or by the discovery of some means of rapidly destroying spirochaetes in the blood withdrawn from the donor. The former method seems unlikely to be adopted in this country; the latter appears to offer an important problem for research.

I am indebted to Dr. A. S. M. Macgregor, medical officer of health to the City of Glasgow, for access to the hospital notes of Case III.

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A SUGGESTED SKIN PROTECTIVE

BY

P. B. MUMFORD, M.D., F.R.C.P.

*Honorary Dermatologist, Manchester Royal Infirmary;
 Honorary Assistant Physician, Manchester and Salford
 Skin Hospital; Honorary Consulting Dermatologist,
 Christie Cancer and Holt Radium
 Institute*

The following suggestions are the outcome of further investigations on the use of emulsifying bases in dermatology. I have described elsewhere (Mumford, 1938) how a paraffin base mixed with a balanced proportion of stable fatty alcohols and acid esters of alcohols will form a neutral stable vehicle for the application of medicament to the human skin. Such vehicle emulsifies on the addition of water or watery solutions, and indeed will appear to utilize the serous discharge from an inflamed area of skin rather than find this a barrier to the transference of its chemical content. Ointments of this nature are easily removed from clothing and bed linen. Finally, unlike the recognized emulsifying agents, they have little or no dehydrating or degreasing action on the skin, an action which may, *per se*, induce secondary inflammatory reaction.

One of industry's minor problems is that a very large number of widely different substances exercise an irritating effect on certain individuals; therefore any preparation that reduces the incidence of occupational dermatitis is worth careful consideration. In theory and practice alike, certain modifications of Halden's emulsifying bases (HEB)—the bases referred to above—would appear to fulfil the major needs of a protective substance without possessing the disadvantages connected with a number of preparations employed in industry to-day.

Types of Skin Protective

Protectives in use may be conveniently classified into four groups: (1) Fats and oils—for example, petroleum jelly, lanolin, wax, etc. (2) Jellies containing colloid—for example, starch, tragacanth, agar, glycerin, honey. (3) Emulsions containing mixtures of substances in Groups 1 and 2. (4) Soap bases—for example, stearates, oleates, and palmitates of alkalis: *free alkali usually present*. Triethanolamine salts may be added as emulsifying agents,

but they are really modified soaps. Antiseptics, essential oils, and inert substances are usually added to improve texture and appearance.

It is clear that many widely different preparations are available to protect the human skin, and it would appear that as a natural corollary no single preparation could be universally applied to assist the divergent types of chemical and physical irritants for which it might be required. A few disadvantages of the above protectives may be mentioned.

Disadvantages of the Protectives in Use

The preparations in Group 1 cannot be saponified or easily emulsified after use, and therefore strong detergent cleansing measures must be adopted at the end of a period of exposure. Such detergents may of themselves be irritant, and indeed I have often stressed the fact that the cause of much occupational dermatitis lies in the cleansing methods used by the employee rather than the substances he or she handles during the course of work. Simple examples of this, recognized by every medical man, are the use of scrubbing-brushes to remove ingrained particles of carbon and dirty oil and the use of alkaline hypochlorite (chemic) to remove dye. Strong detergents frequently saponify the natural oils of the skin, only to produce in that way a true chemical dermatitis. Their application also often entails definite local trauma.

Fats and oils are unsuitable for use on the human skin in many branches of industry because they are transferred to delicate fabrics and paper, thereby soiling the material handled. This applies, for example, to paper workers, printers, and silk manufacturers. The jellies (Group 2) are not likely to exercise any chemical or physical protective action other than that of a barrier. They are not adherent, they are easily soluble in water, and they are highly absorptive. Glycerin tends to have a dehydrating effect.

Emulsions (Group 3) represent a nearer approach to efficiency, and have a varying protective effect. They are more easily and evenly applied, but tend to leave a fatty barrier on the skin, with the consequent disadvantages already mentioned. They are, moreover, easily destroyed by natural phenomena such as evaporation, which alters the balance of ingredients—for example, a dye may be removed from a solution in which it has been previously dissolved. An emulsion will often be found unstable after application to the skin for even a short period, because of its having dried out. Re-emulsification is impossible or difficult, and the cleansing process at the end of the period of work entails the use of a detergent, with its consequent disadvantages.

The soap protectives (Group 4) in wide use to-day may in themselves be irritating because of their hydrolysable alkali content and the *presence of free alkali*. Any agent which precipitates a fatty acid—for example, hydrochloric acid and boric acid—induces a secondary precipitate which may cause inflammatory reaction. Hard water will produce insoluble calcium salts and interfere mechanically with certain manufacturing processes.

The Ideal Protective Agent

The ideal protective agent must thus be of a certain chemical and physical nature and possess characteristics not fulfilled by any of the known products available to-day. In brief, it must (a) be easily spread; (b) remain stable in the presence of most other chemical agents; (c) provide an oil film of low surface tension; (d) be not hygroscopic (be dehydrating); (e) be non-transferable; (f) be without capacity to "cut"—that is, break up and