Fig. 2 is a drawing of the deep aspect of the tendo Achillis. The tendon has been detached from the middle third of the bone and turned over. It resembles the tail-piece of a violin. The fibres of the slender but strong tendon decussate and embrace the facet which articulates with the calcaneum. The expanded portion is concave in all directions, and along its edges are the remnants of the expansions which enclose the bursa. If the tendon is held between the forefinger and thumb at the level of the facet it will be found to be greatly thickened, and it is this which forms the most prominent part of the heel. Fig. 3 shows the back of the calcaneum from which the above tendon was dissected, and the appearances were found to be the same in several other specimens. The postero-superior aspect of the calcaneum

FIG. 1.—Dissection showing the region of the tendo Achillis insertion. The most prominent part of the heel is a thickening of the tendo Achillis overlying the postero-superior angle of the calcaneum. The bursa intervenes between the two. Note how the tendon sweeps backwards to its insertion, and gives an expansion forwards which blends with the periosteum. FIG. 2.—The deep aspect of the lower 6 in. (15 cm.) of the tendo Achillis. The expanded lower portion is concave, and fits over the postero-superior angle of the calcaneum. The facet on the tendon articulates with a similar facet on the bone. This is the most prominent part of the back of the heel, and not the attachment of the tendon as seen on the middle third of the dried bone. FIG. 3.—The posterior aspect of the calcaneum. Note that this is asymmetrical and has an oval facet on its superior and lateral aspects. There is a vertical ridge below the facet. The remainder of the bone shelves towards the sole.

is asymmetrical, and the facet which articulates with that on the tendon is shown. It is this prominent postero-superior angle over which the tendo Achillis passes to reach its insertion which must be removed to decompress it.

Operation

The operation is very simple. The outer aspect of the tendo Achillis is exposed through a short curved incision. The expansion from the paratenon is incised and the bursa opened. This exposes the prominent postero-superior angle of the calcaneum, which is excised with a gouge. Care must be taken to remove enough bone. The skin only is closed. Since the insertion of the tendo Achillis is not interfered with, no post-operative splinting is required, and walking is resumed as soon as the skin incision is healed.

The results of this simple operation are uniformly good, though failures occur when other prominences in this region are confused with the real underlying cause of the condition.

Summary

A lesion caused by rubbing of the shoe rim on the back of the heel is discussed.

The anatomy of the part involved is given in detail.

Most cases respond to conservative treatment, but a few require the simple operation described.

PLACENTAL GLOBULIN IN THE PREVENTION OF MEASLES

BY

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Measles is perhaps the commonest of all the eruptive fevers in man. It is widely distributed, and in the past has been responsible for a high mortality during epidemics. It is on record that a quarter of the population of the Fiji Islands was wiped out during an epidemic of measles in 1875. Death due to measles *per se* is rare; it is the secondary infection that is responsible for such a high mortality. Antibiotics have lowered the death rate by combating the secondary infection.

Prophylactic measures such as quarantine, isolation, etc., with a few specific exceptions, are not of much value in preventing the spread of measles in a community, because of the highly communicable nature of this disease during its early prodromal stage, when it is seldom diagnosed. Quarantine and isolation may, of course, be imposed when measles breaks out in hospitals or institutions, and in that case quarantine should ordinarily be enforced not less than two weeks from exposure and should be increased to about three weeks if immune serum has been injected (which increases the incubation period). To be effective, isolation must be carried out early in the catarrhal stage. It helps in two ways; first, by preventing spread of the disease, and, secondly, by protecting the patients from a possible source of secondary infection.

Immunization of the susceptible section of the population is by far the best method of prophylaxis, and, as with other infectious diseases, active immunization is of greater value than passive immunization; but, unfortunately, active immunization with measles virus grown upon chorio-allantoic membrane of growing chick embryo has not yet passed the experimental stage.

Seroprophyllaxis

Seroprophyllaxis is the next best method: in this, prepared or ready-made antibody is used either to prevent an attack or to produce an attenuated attack of measles after a child is known to have been exposed to the infection, by suitably adjusting the dose and time of the injection of antiserum. The following are the agents used: pooled convalescent serum, pooled adult serum, pooled ascitic fluid, placental globulin (immune globulin), and gamma globulin.

Since Nicolle and Conseil, in 1918, demonstrated the presence of protective antibody in the blood of patients convalescing from measles, convalescent serum has been used successfully in prophylaxis of the disease. The prophylactic value of the serum has been summarized by Stillerman *et al.* (1944). They have shown that out of 502 household contacts, ranging between 6 months and 15 years, who were given prophylactic doses, 50% were completely protected, 49% had modified measles, and only 1% had regular measles. The result is encouraging, but the serum is not readily available.

Degkwitz in 1920 first showed that, though the titre of protective antibody in the blood of measles convalescents gradually declines, the protective antibody remains in the blood throughout life. This discovery has given rise to the

use of pooled adult serum in the prophylaxis of measles; but the large dose of serum (20 to 30 ml.) which is required has prevented its universal use as a prophylactic agent.

Concentrated pooled ascitic fluid has also been suggested, but it has not come into general use.

A More Practical Method

Next came McKhann and his associates in 1933 with their more practical method of antibody production from human placenta which could be purified and concentrated to give an antibody concentrate that was as potent as the average convalescent serum. The consideration which led McKhann and Chu (1933) to the discovery of this new source of antibody was "the established facts regarding placental transmission of immune bodies to infants, and the demonstrable presence in the umbilical cord blood of antibodies of diphtheria, scarlet fever, and poliomyelitis," which suggested to them "that placental protein extract might be prepared which would be capable of increasing in some respects the protective reaction of infants to certain disease processes. Whereas blood obtained from umbilical cord represents foetal blood and should contain only antibodies to which the placenta is permeable, the material which may be extracted from placenta represents foetal blood, maternal blood, and probably extracts from the placental tissue itself. It could then be assumed not only that the antibodies present in cord blood would be present in extracts made from the placenta, but also that antibodies might be present to which the placenta would be impermeable."

Another landmark in the history of the production of measles antisera is the period 1940-5, during which Cohn *et al.* (1944), taking advantage of the large-scale supplies of blood available during the second world war, fractionated a considerable portion collected for military purposes, to produce gamma-globulin, which contains most of the antibodies in human blood. This gamma-globulin could be obtained almost pure, representing about 25 times the concentration of the immune bodies in the original plasma. Many observers have demonstrated the efficiency of gamma-globulin in the control of measles, and have recommended its use because of the small dose required, its uniform potency, and the greater freedom from reactions than any other form of antibody generally available. Of the series of 814 cases of Greenberg *et al.* (1944) which were given 2 ml. of gamma-globulin, 78.7% did not have measles, 19.7% had a mild attack, 1.6% had a moderate attack, and none developed a severe attack. Only 7 (less than 1%) had reactions, and most of these were of a mild nature. Stokes *et al.* (1944) and Ordman *et al.* (1944) had more or less similar results.

Present Investigation

In this paper we have tried to assess the value of placental globulin as a prophylactic agent against measles. Placental globulin was selected because it was readily available, and an opportunity of trying it on hospital contacts came when measles broke out in the diphtheria ward of our hospital. The first case with the typical rash was detected on February 12, 1954, and next day three other patients developed a rash. All of them had fever for four or five days before the rash appeared. The patients were 1 to 3 years old. As soon as the rash was seen the patients were isolated in an ante-room, quarantine was clamped down, and further admission to the ward was stopped. The 32 patients who had not developed a rash were given anti-measles serum (placental globulin) on February 13—that is, 24 hours after detection of the first case. All our patients were under treatment for diphtheria, so we aimed at complete protection and gave the injection at the earliest possible moment.

The patients were divided into two groups—one under 4 years of age and the other above 4 years (the maximum being 7 years). All the 24 patients in the group under 4 years received 2 ml. of the placental globulin intramus-

cularly. Of the group above 4 years, three received 4 ml. of the injection intramuscularly and the other five 2 ml. only. The following results were obtained.

Prophylaxis Rate

Age	No. of Patients Injected	No Measles	Mild Measles	Regular Measles
Under 6 months ..	2	1		1
6 months-1 year ..	3	2		1
1-2 years ..	7	6	1	
2-3 " " ..	7	7		
3-4 " " ..	5	5		
4-5 " " ..	5	5		
5+ " " ..	3	3		
	32	29	1	2

In one of the two patients who developed regular measles the rash appeared on February 14, and in the other on February 15—that is, 24 hours and 48 hours after injection of the antimeasles serum respectively. The injections were given when the patients were actually running a temperature, so it is obvious that they were too late to be effective. If these two cases are eliminated from the above list, the protection rate of placental globulin is 96.6%. In the only case in which mild measles developed, the rash appeared six days after the injection. Many of our cases were under observation for more than three weeks, some for more than a month, and one of them for as long as two and a half months; none of them developed measles.

Other Workers' Results

McKhann in one of his later papers analysed a group of 1,848 contacts. In the first group, containing 585 contacts, placental globulin was given for complete protection, and in a second group (1,263 contacts) the injection was given for modification. The result of the first group was: complete protection in 53.8%, modification in 40.4%, and failure in 5.8%; in the second group the rate of complete protection was 46.1%, modification 46.4%, and failure 7.5%. When these sets of figures are combined, the complete protection rate comes to 48.5%, the modification rate to 44.4%, and the failure rate to 7%.

The same author collected reports from the literature of 2,740 cases in which placental extract was used as a prophylactic agent. The protection rate in those cases was 64.3%, modification 30.4%, and failure 5.3%. In a group of 90 cases of Greenberg *et al.* the protection rate was 38.9%, mild measles occurred in 26.6%, and moderate measles in 11.1%. There was failure in 23.3% of cases, in which regular measles occurred.

The result obtained in our series is obviously much better than that of the previous observers; this may be partly due to prompt and effective isolation of the patients who developed measles, together with immediate immunization of all the contacts. We did not observe any variation worthy of mention in the protection rate in different age groups, as was found by Greenberg *et al.*

Reaction Rate

None of our patients who received 2 ml. of placental globulin developed any reaction. Though none of the three patients who received 4 ml. of injection developed any local reaction, two developed a general reaction such as a rise of temperature. In one case the temperature rose to 100.5° F. (38.6° C.) for two days, and in the other there was a slight rise for five days. In the third case the patient was running a temperature when the injection was given, so the general reaction could not be ascertained. Most of the previous observers found a high reaction rate. In McKhann's group as many as 50% had a reaction, and in approximately 5% it was severe; in the series of Greenberg *et al.* the reaction rate was 41%; and in the series of Karelitz *et al.* (1937) 34 out of 64 contacts, or more than 50%, had a severe reaction. The dose of placental extract

in McKhann's cases is not known, but in those of Greenberg *et al.* it was 5 ml., and in those of Karelitz *et al.* 10 to 20 ml. How far the dose of the placental extract influences the reaction rate is to be investigated.

Summary

Results from the injection of placental globulin to 32 patients in the diphtheria ward of the Medical College Hospitals, Calcutta, who came in contact with measles are discussed.

The protection rate of 96.6% which was obtained may have been due partly to the prompt and effective isolation of the patients who developed measles, together with the immediate immunization of all contacts.

There was no reaction with 2 ml. of placental globulin, but with 4 ml. two out of three developed a reaction. It is suggested that the high reaction rate of the previous observers might have been due to the use of larger doses of the antiserum.

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THE PREMEDICATION OF CHILDREN FOR TONSILLECTOMY

WITH SPECIAL REFERENCE TO METHYLPENTYNOL

BY

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Under ideal conditions pre-operative sedation for children undergoing tonsillectomy would perhaps not be necessary. Where lift and busy corridor separate ward and anaesthetic room, some premedication is helpful to allay fear.

The importance of avoiding psychic trauma has long been realized. Gwathmey (1936) suggests that the practice of holding a crying, frightened child and compelling him to undergo something which he instinctively dreads often leaves an ineffaceable memory that quite naturally results in an intense hatred and distrust of doctors, nurses, and hospitals. On the other hand, ill-chosen premedication may cause depression of the cough reflex and perhaps allow aspiration of blood or vomit. Barnes (1952) gives warning that there may be danger to life in

premedication other than atropine unless, after operation, sufficient first-class nursing is available for each child to have all the attention he needs. Evans (1928) stresses the aspiration danger due to central nervous depression. Cullen (1946) feels that scopolamine, in the quantity needed by small children before ether, is dangerous, and that barbiturates have the additional danger of predisposing to laryngospasm.

Barbiturates combined with atropine were in routine use before this investigation started. Pentobarbitone ("nembutal") and quinalbarbitone ("seconal") were considered to be excellent. The children fell asleep in bed and knew nothing of their visit to the theatre. Administration was simple, and no difficulty was experienced through depression of the cough reflex and of respiration. A disadvantage was that nearly all showed post-operative restlessness and, to be sure of their not injuring themselves, needed more nursing attention than was at that time conveniently available. Post-operative "nepenthe," 1 minim (0.06 ml.) for each year of age, helped the children to settle. However, the giving of central depressants both before and after operation might well have been criticized had accident occurred. Thiopentone per rectum gave perhaps the most satisfactory results, but post-operative restlessness, although it occurred but rarely, could be so severe as to restart bleeding from the tonsillectomy site; moreover, to ensure retention an enema was needed, and the pre-operative routine lacked simplicity.

It seemed possible that choice of premedication for these children might have become a habit and that perhaps some more suitable drug or combination of drugs was as yet untried. Methypentynol as premedication for children having minor operations as out-patients had given encouraging results. It was therefore decided to observe its effect on a series of children for tonsillectomy.

Methypentynol was first described in 1951 by Margolin *et al.* It is a higher alcohol without toxic properties, and is rapidly metabolized. The *British Medical Journal* (1953) advised a cautious attitude lest it might have depressant effects. In this investigation no harmful effect, except occasional gastric irritation made evident by vomiting, and no respiratory or circulatory depression were observed.

Present Investigation

The preparation of methypentynol used was "oblivion elixir." The spearmint flavour was enjoyed by the children, and no advantage was observed by diluting with water. The dosage used varied from 250 mg. (one teaspoonful) for the smaller children to 750 mg. for the bigger children (Rendell, 1954). Atropine, 1/100 gr. (0.65 mg.), was given at the same time in every case except two, which received instead scopolamine, 1/300 gr. and 1/400 gr. (0.22 and 0.16 mg.) respectively. Though normally premedication was given an hour before operation, half to two hours or more also proved satisfactory. Of the 152 children treated, 126 arrived in the anaesthetic room awake, interested, peculiarly happy, and co-operative; 4, including the one who was given scopolamine, 1/300 gr. (0.22 mg.), instead of atropine, were fast asleep; 5 cases were complete failures, the children being awake and frightened, screaming and resisting; and 17 were partial failures—tearful and apprehensive. Although the children awaiting operation saw others returning from the theatre, they appeared to be unperturbed.

The anaesthetic agents used were nitrous oxide, oxygen, and ether, or, for bigger children, thiopentone, nitrous oxide, and ether. When necessary, nepenthe was administered post-operatively.

In about a tenth of the cases the induction, always slower than after barbiturate premedication, was delayed by vomiting of the elixir. Many of the children vomited it, mixed with blood, as soon as they came round from the anaesthetic and while still in the operating theatre. Protective reflexes were present when vomiting occurred. Back in bed, the children settled down quietly; serious restlessness did