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The Surgery

OF

Ritual Circumcision.

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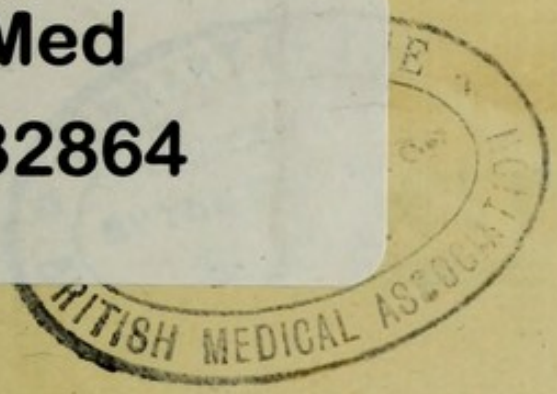
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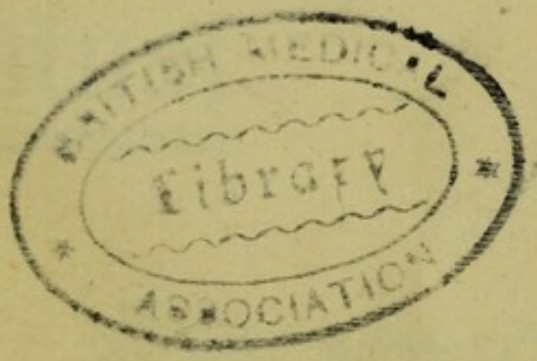
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The Surgery . . of Ritual . . . . Circumcision,

BY

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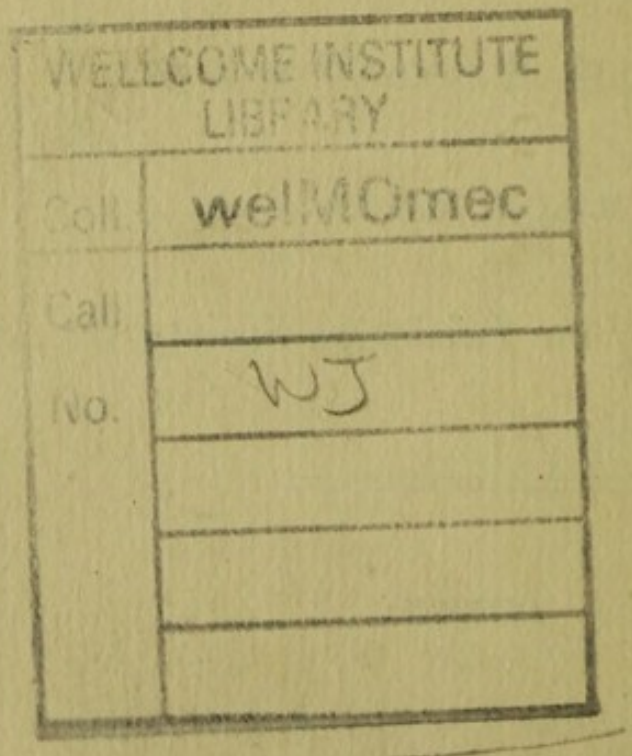

PREFACE.

The object of the following few pages is to provide a basis of instruction in the surgical aspect of the Jewish rite of circumcision. The performance of this simple operation is not limited to medical men. It is therefore essential that the lay Mohel should possess a scientific knowledge of the important task he undertakes.

The Initiation Society which controls the instruction of Mohelim has arranged a Syllabus which guarantees such an acquaintance with the subject. This little book is planned in accordance with that syllabus. Its main object is to bring the principles of ASEPSIS *within the information of everyone acting as a Mohel, and to insist upon the urgent need of carrying these principles into practice.*

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11, SHOOT-UP-HILL,
BRONDESBURY, N.W.

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CHAPTER I.

Infection of Wounds.

The greatest advance in modern surgery has been to show how wounds become infected and cause general blood poisoning. This applies both to wounds made by the knife of the Surgeon as well as to accidental injuries. *The principles concerned in this matter involve not only the arrangements necessary for a severe and prolonged operation but also those required for the simple circumcision of an infant.* It is therefore essential that those who perform ritual circumcision should be familiar with the elementary teachings of the *Antiseptic System of Surgery* which is now universally adopted even in the most trifling surgical procedings.

Heavy responsibility lies upon the Mohel to carry out every case strictly in accord with the lessons of surgical cleanliness. *Surgical Cleanliness* begins where ordinary cleanliness leaves off. Its object is to destroy certain minute particles of matter which are invisible to the naked eye, but which are *living organisms of a vegetable nature*, able to grow very luxuriantly in blood, and wound discharges. Here they produce a poison which gets absorbed into the

body, causing serious symptoms of disease; or they themselves enter the blood stream and circulate in it with even more disastrous results. These organisms can be observed under the microscope, but can only be seen by the naked eye when growing together in colonies after being planted in such substances as gelatine or broth, or on the surface of a slice of potato. They correspond exactly to the growth of *mould or fungus* on stale cheese or meat, or to the growth of yeast in fermenting grape juice. When seen separately under the microscope, or when growing in the mass they possess very distinct characters so that the expert is able to distinguish the one from the other, with the same confidence as a pear may be distinguished from a fig.

A large number of diseases is due to the growth in the body of certain of these organisms, and in many diseases we can be sure of always finding the particular one responsible for the condition, either in the blood or in the discharges from the body. This is notably the case in Consumption, Typhoid Fever, and Malarial Fever. We often know how the organism has obtained entrance into the body; it may be either by the lungs or the stomach, or in other words through air or through food.

We are however only concerned just now with the *organisms which enter the body by means of an open wound.*

These nearly all belong to one class—*micro-cocci.* They are minute round bodies about $\frac{1}{25000}$ inch in diameter. They possess the peculiarity of growing together in clusters like grapes, or in chains. They are responsible for the diseased conditions of wounds which delay healing, for inflammation around wounds and for the general blood-poisoning which may result.

These organisms are very abundant in the dust of rooms, on dirty clothes and unclean general surroundings, and there can be no doubt that everybody is often infected by them. But fortunately disease results only rarely, because there are special powers resident in the vital tissues which enable them successfully to resist the poisonous effects of these organisms. There are however certain circumstances in which they are liable to be more harmful than in others.

1) *When they are absorbed in especially large numbers.*

2) *When absorbed in an especially active state.*

3) *When the body is in a conditon of ill-health from whatever cause.*

4) *In the presence of cold.*

Each one of these circumstances is of special importance in relation to circumcision and may be commented on as follows.

1) The slightest departure from scrupulous cleanliness either on the genitals of the infant, on the instruments or dressings used, or on the hands of the Mohel enormously increases the number of microbes which may possibly infect the wound. *Hence the necessity for absolute ordinary cleanliness before resorting to antiseptic measures.*

2) It is well known that these organisms exist in a very virulent form in unhealthy wounds, in boils and in abscesses, and the worst cases of blood poisoning have resulted from the direct infection of a healthy wound from an unhealthy one. For this reason all the precautions in regard to the disinfection of the hands, which will be referred to subsequently, must be carried out with rigorous care, when there has been any possibility of their having come in contact with such sources of infection.

3) The natural protective power of the body against infection is diminished when the general health is below the normal standard. This occurs in infants mainly, when they are premature, or suffering from jaundice, sickness or diarrhœa, congenital disease of the heart or other organs. In these circumstances the circumcision must be delayed.

When the parts are unduly bruised, the local resistance is considerably lowered ; hence the par-

amount necessity of the operation being performed neatly and dexterously.

If these micro-cocci have already found access to the body in other parts, as evidenced by *purulent ophthalmia* (i.e. matter discharging from the eye lids) or *suppuration about the navel,* it is important that these conditions be cured before the circumcision is undertaken, because experience shows that in their presence the risks of a general blood infection are increased.

4) There is a special liability for the skin of an infant, particularly in the region of the scrotum, to become irritated by its excretions and to present the eruption known as *eczema.* The folds of the groin occasionally suffer in the same way, the skin becoming reddened and peeling. These cases demand medical attention before operation, owing to special risks of infection. *No infant presenting a rash of any kind should be circumcised without previous examination by a doctor, because it may indicate constitutional disease.*

5) Cold always indicates that the bodily processes are deficient in activity. Infants are especially liable to cold, and hence the necessity to supply them with abundant artificial warmth. This is especially required during the exposure which a circumcision involves, and therefore due attention must be paid

to the temperature of the room where the operation takes place, draughts must be avoided, and adequate protection of the infant when carried from and to the bedroom, must be ensured.

CHAPTER II.

Results of the Infection of Wounds.

The name usually given to the conditions which result from wound infection is *Septic Disease*. This includes both the mild and the grave troubles which may ensue.

The mild forms of infection usually appear as interference with the rapid healing of the circumcision wound. The principal of these are :-

1) Ulceration at the cut edge of the prepuce.
2) Ulceration in the raw tissue left on the under surface of the penis between the reflected mucous membrane and the cut skin.
3) Sloughing or mortification of the reflected mucous membrane.

These conditions are usually attended with some amount of swelling; and the unhealthy state of the wound with the accompanying discharge afford a fertile soil for the rapid growth and multiplication of micro-organisms and their absorption into the system.

Of the more serious results of infection the principal is *Erysipelas* in its various forms. Here we find that as the signs of unhealthy inflammation around the wound occur, symptoms of constitutional illness begin. The infant becomes feverish, there is loss of appetite, rapid breathing and wasting supervene, with a profound alteration in the general appearance. The signs evident, locally, are redness of the skin increasing to a vivid blush which spreads on to the thighs, scrotum or abdomen. The surface is tender, and the edge of the red patch is sharply defined from the surrounding healthy skin. The disease is most active at this sharp margin for it is there that the micro-cocci may be found in abundance. The glands in the groin become swollen and tender, and the circumcision wound, failing to heal will probably inflame and suppurate. While this is going on, a poison is being manufactured by the microbes in their growth, and this poison being absorbed into the circulation, generally proves fatal to the infant.

The process is usually limited to the skin, and its uppermost layer is often raised into blebs containing clear or discoloured blood serum. But the morbid change may take place first in the tissues under the skin, when there will be great swelling and dropsy of the part so that the pressure of the finger will leave a pit in the skin before the latter becomes itself inflamed. In these cases the organisms readily enter the blood stream and being carried away to

distant organs set up infection in these. These are necessarily the most hopeless cases of blood-poisoning.

So far we have briefly considered infection by the group of organisms known as micro-cocci. It is necessary to point out here that at least two of the organisms of the group of *Bacilli* have been known to infect the circumcision wound. The one is the Tetanus (lockjaw) Bacillus, the other is the Tubercle Bacillus.

In *Tetanus* the first symptom noticed is that the infant is unable to suck, and on examination it will be found that this is due to cramp of the muscles of the jaw, which become fixed and hard. The face assumes a peculiar aspect which is quite characteristic of this disease, spasms of the limbs and then convulsions of the whole body take place, the joints become stiff and the case is almost invariably fatal.

In regard to the infection by the Tubercle Bacillus it may be said that this occurance is one of the rarest of the rare sequels of circumcision, but it appears that *tubercular ulcers* have arisen over the area of the wound when the METZIZAH has been performed by mouth suction on the part of a Mohel who was suffering from Tuberculosis. A number of these cases have been reported from time to time, and in some of them it apparently led to general Tuberculosis *(consumption)*.

The foregoing brief statements exhaust most of the possibilities of wound infection by means of micro-organisms. There is however another source of infection, not yet definitely proved to be of microbic origin, which has important relations to circumcision. This is the poison of *Syphilis*. If the Mohel should be suffering from this disease the secretions of the mouth, are infective and the disease may easily be transmitted to the infant by means of Metzizah. On the other hand, should the infant be born with the disease — a circumstance of not infrequent occurrence — it must be remembered that its blood is charged with the poison, and is capable of infecting a healthy individual when it is brought into contact with any wound, abrasion or other breach of surface.

CHAPTER III.

Elements of the Antiseptic Method.

The purpose of Antiseptic Surgery is to avoid the occurrence of the dangers of infection referred to in the preceding chapter. There are many methods of carrying out the system, but the present description being limited to the requirements of circumcision does not aim at being exhaustive. The two objects aimed at are:

1) *The prevention of any micro-organisms gaining entrance to the wound.* This end is attained by the disinfection of the hands and especially the thumbnails of the operator, of the instruments and dressings used; and by perfect cleanliness of the genitals of the infant. It may be said that the brief exposure of the parts during the performance of the circumcision carries with it no risk of infection, because the organisms, we have been considering are not usually airborne.

2) *The application of such dressings as will keep the wound in an aseptic condition.* Even the small amount of discharge from a cir-

cumcision wound forms a splendid soil for the growth of micro-organisms. It is necessary therefore to apply a dressing which has been saturated with such antiseptics as will destroy that constituent of the discharge which makes it a good culture material.

The most convenient antiseptic for general use is *Carbolic Acid.* This is a clear, colourless liquid of rather oily consistence, which rapidly becomes converted into solid crystals in cold weather. When required for purposes of disinfection it should be mixed with 39 times its quantity of water, or roughly one pint of water requires one tablespoonful of pure Carbolic Acid to make a solution of 1 in 40.

This solution is required for soaking the hands after they have been washed with soap and warm water, and the nails scrubbed with a nail brush. This latter proceeding is one of *ordinary cleanliness,* the soaking in the Carbolic Acid solution, which should be warm is in order to obtain *Surgical Cleanliness.* It will be readily understood, that if the hands come in contact with any possible source of infection after this soaking, then it must be repeated before beginning the operation. The disinfection of the hands must be the last stage in all the preparations for the circumcision. A similar solution of 1 in 40 Carbolic Acid may be used for placing the instruments in before the operation.

They are to be taken directly out of the solution as required. A shallow dish of a material easily cleaned, as metal, glass or porcelain should be filled with $2\frac{1}{2}$ ounces (5 tablespoons) of water which has been boiled, and to this one half a teaspoonful of Carbolic Acid is added, taking care that the acid is thoroughly well mixed up with the water and not allowed to float about in droplets.

If the instruments are scrupulously clean, i.e., if they have been washed thoroughly with soap and hot water, they require to remain for *one hour* in the Carbolic Acid solution to render them sufficiently disinfected for operating purposes. It is therefore quicker, as it is also more scientific to *sterilize the instruments before using them.* By sterilizing them we kill any micro-organisms that may be present on them, and we are then confident that no living germs are carried to the wound by means of the instruments. In other words they are *aseptic.* Instruments are sterilized by boiling for about ten minutes in clean water. It is useful to add washing soda in the proportion of 5 grains to every two tablespoons of water. It is obvious that the instruments must be of metal, as no other material will stand boiling. They must be made in such a way as to prevent the accumulation of dust or dirt in joints or crevices.

Compact apparatus for sterilization is supplied by every surgical instrument maker. The instruments are usually placed on a wire gauze tray with handles and then into the sterilizing dish, so that when the boiling is completed, they are lifted out on this tray by means of hooks supplied for the purpose. They are at once transferred to the shallow dish containing the 1 in 40 Carbolic Acid solution detailed above. By these means the instruments are cooled ready for use, for obviously they cannot be taken directly out of the boiling water with the fingers; and the fact that they are in an antiseptic solution, prevents the access of any germs during the short interval before they are actually handled.

The *dressings* used in Circumcision should consist only of *lint* and *gauze*. It is necessary that the dressing should be sterilized and also impregnated with some antiseptic so as to render harmless any infective material which may accidentally contaminate the wound after circumcision. These dressings are supplied by manufacturers, already sterilized by exposure to super-heated steam, and rendered antiseptic by various chemical agents. Carbolic Acid used for the hands and the instruments, is often employed for the dressings, the antiseptic being fixed in the lint and the gauze by a special process. Most surgeons, however, prefer "*double cyanide*" dressings, in which the antiseptic used is a salt known as cyanide of zinc and mercury.

From the first dressing until the circumcision is absolutely healed nothing but gauze need be used. In a normal case no other application of any kind whatsoever is required. It is usual however in applying the first dressing at the circumcision to use lint to surround the root of the penis as it is firmer than gauze. When this is done a piece of tape is twisted round the lint to retain it in position. The tape and the lint must both be sterilized like the gauze.

The best course to adopt in regard to the dressings is to obtain them from a reliable firm of manufacturers, who will supply them ready cut to the pattern required, packed in small sealed aseptic tin cases ready for use.

Having adopted all these precautions the Mohel may be confident that in regard to his own hands, the instruments, and the dressings he has exercised every care which surgical science demands. The only other important detail which demands attention is the part concerned in circumcision. It is obvious that all the safeguards hitherto considered are valueless unless the infant himself is in a perfectly clean condition. The disinfection of the skin of an adult before an operation is always a serious and difficult matter, because the skin harbours so many micro-organisms, including the very micro-cocci referred to previously. Elaborate measures are

therefore employed for the skin disenfection. But in the case of an infant the skin cannot be supposed to be such a probable source of wound infection. It is sufficient that the genitals be washed about half an hour before circumcision, with soap and warm water, and subsequently a fomentation of Boracic lint applied. It is as well to avoid the use of the various baby powders which nurses are so fond of sprinkling freely on the folds of the skin. If it is thought desirable to employ such a dusting powder, it should be a mixture of equal parts of Boracic Acid and Starch.

The infant having been prepared as here stated, the circumcision may proceed as soon as he is put in position. Should any soiling have taken place, the infant must again be cleansed, and in this case the genitals must be washed with the carbolic Acid solution (1 in 40) by means of a swab of cotton wool.

CHAPTER IV.

Surgical Anatomy.

It is essential for the Mohel to possess a knowledge of the structure of the organ on which he operates.

The skin of the penis is continuous on the upper surface with the skin of the abdomen, and on the under surface with that of the scrotum. On drawing forward the prepuce or foreskin it is very easy to include the skin of the scrotum in the grasp of the fingers unless due care is taken. If the traction on the foreskin is too forcible and the skin of the scrotum is therefore pulled up tightly, there is a danger of the scrotal skin being slit up to some extent. The intimate connection of the skin of the penis and scrotum must always be kept well in mind.

Under the foreskin and continuous with it at its free margin there is a membrane which rising from the neck or constriction below the glans envelops the latter entirely up to the opening of the urethra. Here it leaves the glans and joins the outer skin. The name given to this structure is *mucous*

membrane, and the method of dealing with it constitutes the principal portion of the art of circumcision.

This mucous membrane is the whitish glistening structure which appears after the removal of the skin.

It is important to note the disposition of this mucous membrane, as revealed after the amputation of the prepruce.

1) It usually *covers over the glans right up to the orifice of the urethra.*

2) It may be reflected off the glans before reaching this point, and become continuous with or adherent to the skin lining. In this case the glans will not be completely covered by the mucous membrane, because a small portion will have been cut off in the first stage of the operation. In those cases the membrane missing from the upper part of the glans will be found on the inside of the amputated foreskin.

3) In other cases this inner mucous membrane is very deficient covering only three quarters or less of the surface of the glans, the remaining portion being adherent to the inner surface of the foreskin.

The *consistence of this membrane* is such that it can be easily torn through but,

1) It may be elastic so that it stretches without tearing.

2) It may be so thin that it is liable to be pushed down by the nails instead of being torn.

3) It may be so thick as to necessitate the use of the scissors to cut it.

It may be loosely applied to the glans so that the thumb nails are easily inserted beneath it, or it may be so adherent that great difficulty is experienced in tearing it through and peeling it off the glans.

An important fold of this membrane, triangular in shape is attached to the under surface of the glans below its base reaching almost up to the opening of the urethra. This is called the *Frænum*, and it is fully exposed during the second stage of the operation.

The body of the penis itself is composed of three parts. On the upper surface behind the glans are the two *Corpora Cavernosa*, united firmly together, but leaving a hollow on their under surface for the *Corpus Spongiosum* which is prolonged beyond them in an enlarged extremity known as the *glans*. The constriction beneath the glans is called the *Cervix or Neck*, while the projecting rim of the glans above this is called the *Corona*. Occasionally there are found here small masses of soft creamy material, which is the natural secretion of the part.

The canal of the urethra runs in the corpus spongiosum. Each of these three corpora is firmly united to the pubic bone behind.

They are constructed of an outer sheath from the inner surface of which numerous fine membranous partitions stretch, dividing the whole up into numerous small compartments. These compartments are lined with a fine network of veins, which are able to expand with blood and to distend and fill up these spaces. When this occurs the whole organ swells and becomes firm and the tension of the fibrous material forming the main structure is called into play so that the process assumes the form of an erection. The veins which should drain the penis of blood are compressed by the action of certain muscles and this adds to the engorgment of the organ.

When the penis of an infant is in a state of erection the operation of circumcision can be more easily performed and the dressing more efficiently applied. The manipulation of the organ necessary to grasp the prepuce is generally sufficient to stimulate the increased blood supply requisite for an erection. The skin of the penis does not share with the rest of the organ, a greater amount of blood during this state. It stretches by its own elasticity.

All the arteries and veins of the penis run in the deep structures previously alluded to, so that circumcision, in an infant at any rate, can never wound a blood vessel. The *Frœnum is freely supplied with blood*, and if cut will produce troublesome hæmorrhage, but a circumcision in no way interferes with this part.

CHAPTER V.

Technique of Operation.

A good light is essential for the performance of circumcision.

The instruments required are as follows :-

1) *Knife* of steel, to be made of one piece of metal without joints, crevices or any ornamentation whatsoever. The handle should be stout enough to permit a firm grasp upon it. The blade should be about 5 inches in length and fully half inch in width.

2) *Shield.* This is a metal plate with a centre slit, the edges of which are made to grasp the prepuce at the level of the amputation. The Shield protects both the glans penis and the scrotum from injury by the knife.

3) *Scissors.* These are required occasionally to cut through the mucous membrane. They should be of the pattern known as the "*blunt pointed.*" When it is evident that

the mucous membrane is very adherent to the glans, the separation of these two structures may be effected by the use of a *Probe*. This is a thin metal rod which is easily inserted under the mucous membrane and swept round the glans so as to break through the adhesions.

The person who is to hold the infant, is seated on a chair with his feet on the side rail of a second chair so as to keep the knees raised. The latter must be kept close together. A firm pillow is placed on the knees and the infant is laid thereon facing the Mohel. When the necessary clothing has been loosened, the thighs and knees are bent up completely (flexed) and then the thighs are in addition rotated outwards, and kept in this position by the hands of the individual holding the infant.

The clothes should be displaced behind the buttocks of the infant so as to raise the part.

The antiseptic preparations described in Chapter iii. having been carried out, the operation is performed according to the following stages.

Stage I. The root of the penis is taken between the index and middle fingers of the right hand palm downwards, and pressure is made firmly backwards, the index finger being against the scrotum, the middle

finger against the lower portion of the abdomen. This steadies the penis, keeps away the skin of the scrotum, and helps towards producing an erection.

Stage II. Keeping these fingers in this position, the *glans is grasped between the thumb and index finger of the left hand.* It is important not merely to take hold of the foreskin, the glans must be included between the fingers, and it must be examined by them so as to discover where it ends. This is determined by feeling the projecting rim of the Corona, and the neck beneath it. The skin overlying this marks the precise position where the shield is to be placed. When this position is accurately made out the whole of the skin in front of it is withdrawn beyond the glans by the fingers, and very firmly held upwards away from the scrotum.

Stage III. The fingers are now to be removed from the root of the penis, and the shield is taken into the right hand and adjusted on the prepuce exactly at the level of the finger tips which are grasping it. The *direction of the shield is important.* It must *not* be put on at right angles to the penis, but obliquely upwards, i.e., the part of the shield held in the hand must incline towards

the abdomen of the infant, and the other part away from it. In this way the circumcision will take off the foreskin in a quill shape, and it will leave a sufficient amount of skin on the under surface of the penis. If this precaution is not observed there is a great risk of denuding the under surface of the skin almost as far as the scrotum.

Stage IV. The knife is then taken in the right hand and with one sweep along the shield the foreskin is amputated. The knife must be handled firmly, and the cut made from the heel. The cut circular edge of the skin immediately retracts behind the corona, though on the under surface the amount of skin remaining may fall short of this level.

Stage V. The amputated foreskin and the knife are now put aside, the shield having already fallen off. The Mohel will now, at a glance, observe the disposition of the mucous membrane covering the glans. He insinuates the nail of one thumb under its edge, and seizes it between the nail and the index finger. When this is grasped the manoeuvre is repeated with the thumbnail and index finger of the other hand, keeping the two hands close together. Before proceed-

ing further, the Mohel must be sure that he has a firm hold of the membrane.

The next step is to tear the membrane down in the centre, until the prominent edge of the corona is exposed. This tearing may be completed with one movement of the hands, but if the membrane is long more than one movement may be required to tear it through completely.

When the neck below the corona is seen, the flaps are reflected laterally backwards, so that the torn edges of the mucous membrane may join the cut edge of the skin. Care must be taken that the membrane is peeled off as far as possible (i.e. till its junction with the frænum) from the under surface of the glans and reflected directly backwards so as to unite with the cut edge of the skin.

The essence of the operation consists in the proper performance of this stage. If not performed efficiently the resulting circumcision is very imperfect. The mistakes usually made by beginners are as follows :- 1) The mucous membrane is stretched without being torn through ; the glans then projects completely giving the impression

that it has been exposed by the proper method. 2) The membrane is rolled back over the glans instead of being torn back. 3) The membrane is cleared off from the upper surface of the glans, but is not sufficiently peeled off from the under surface.

Stage VI. The operation is really completed with the preceding stage. *]

The practice of Metzizah may now be carried out by means of a swab of sterilized cotton wool with which the penis is to be firmly compressed. This will effectually absorb the small amount of blood free in the tissues and at the same time helps to clean up the part.

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*] The performance of Metzizah according to statutory Jewish Law consists of suction by the mouth. The original sources of this practice indicate that it was considered an essential part of the operation in the same way as the dressing of the wound was. Failure to carry out this measure was regarded as constituting a serious risk to the infant. The possible dangers of this practice have become obvious during recent years and direct suction of the wound is, from every point of view, inadmissible. In order to carry out the ancient practice a device is used by some Mohelim by which the suction is performed through a small glass tube with a perforation at its end and containing a piece of absorbent wool in its interior.

Stage VII. The *dressing* consists of a strip of sterilized and antiseptic lint or gauze long enough to encircle the penis below the glans two or three times, and wide enough to cover the whole space between the corona and the root of the penis, i.e. $4\frac{1}{4}$in. × $\frac{3}{4}$in. The first layer of dressing is applied entirely below the glans and covers over the whole of the reflected mucous membrane. Care must be taken to apply this strip of lint at the very root of the penis and to begin on the under surface; otherwise there is a tendency for the dressing in this latter position only to just to reach the edge of the incision and to push it back towards the scrotum and thus increase the size of the raw area.

The glans must be quite free of the dressing encircling the penis and must project completely beyond the strip of lint applied below it. This piece of lint or gauze adheres quite well by itself, but to ensure its remaining in position, it is better to secure it by surrounding it once or twice with a piece of sterilized tape and twisting up the ends. *If this is done too tightly it may obstruct the free flow of urine, or congest the glans*

The dressing is completed by covering over the naked and projecting glans with a square piece of antiseptic gauze. A diaper folded in the ordinary triangular shape is then put on, and this is secured firmly by means of broad tape. Two or three turns must be given round the thighs so as to keep them fixed, and the ends are to be tied over the hip.

During the after treatment the re-dressing may be regulated as follows. After about 10 or 12 hours, but at any rate within the first 24 hours, the piece of gauze covering the glans must be removed and the tape surrounding the dressing untwisted and also removed. If the circumcision has been properly and carefully performed, so that the whole of the mucous membrane and skin are kept back by the dressing, and the whole of the glans remains exposed, nothing further need be done but to replace some fresh gauze over the glans. On the following day the whole of the dressing should be removed, and gauze be re-applied around the penis leaving the end of the glans free. This dressing will fall off when the infant is in the bath, and may be renovated as often as necessary. As an alternative procedure the whole dressing may be removed after the

first 24 hours, and the part re-dressed with gauze.

Circumcision in Abnormal Cases.

The penis is subject to many departures from its usual anatomy, but here it will only be necessary to notice some of the more usual abnormalities.

1st. In some cases the penis is sunken into the pubic skin, so that on grasping the prepuce the whole integument of the penis is pulled up leaving the organ itself buried in the skin behind. It will be found that in many of these cases the testicles have not descended into the scrotum. The first stage of the operation, in these instances, is all important. The root of the penis is embraced between the second and third fingers of the right hand as previously explained and firm pressure backwards is made until a definite erection is made. The amount of skin to be amputated must be very accurately estimated, the shield carefully adjusted in an oblique direction, as in these cases the inclusion of some of the skin of the scrotum is very easy. The mucous membrane often proves to be very thick, but whatever its consistence may be it should be cut away with scissors after reflection as this proceeding helps to prevent the glans sinking back into the skin. A careful examination of the infant must be made

in these cases because they frequently denote immature development, and call for postponement of the performance of the circumcision.

2nd. The prepuce is sometimes deficient. The upper portion of the glans may be exposed and project beyond the short prepuce. The amount of the latter which should be removed is so small, that on pulling it forward there is not sufficient in the small circle of skin for the fingers to obtain a firm grasp. In this case forceps should be employed to hold the foreskin.

3rd. Some infants are born apparently circumcised. On examination it will be found that a considerable amount of prepuce still remains on the upper surface of the penis, while the under surface may be quite free. In these cases the whole of the remaining prepuce is grasped between the fingers and the operation is performed in the usual manner. Here also the underlying mucous membrane should be entirely cut away after it has been torn through.

CHAPTER VI.

Repair of the Wound.

As the whole difference between a scientific operator and a merely mechanical Mohel lies in an appreciation of the process of repair in the wound inflicted, it becomes necessary to consider this in detail.

The area of the circumcision wound extends between the corona of the glans and the circular cut edge of the skin. The skin of the penis always retracts, so that if the shield has been placed in the position previously indicated, the skin will not after the circumcision reach quite up to the corona ; the neck of the glans will be well exposed. This is the condition to be attained in ritual circumcision.

The mucous membrane, after being torn through and reflected covers over the area of the resulting wound. *The planning of the operation should be so carried out that the torn edges of the mucous membrane may unite with the cut edge of the skin.* This approximation is not usually complete all round the wound. The tearing through of the mucous membrane produces a narrow V shaped rent ; this is

widened out when the membrane is reflected, and if carefully apposed to the cut skin, will unite with it. But the edge of that portion of the membrane peeled off from the under surface of the glans will often fail to unite with the cut edge of the skin on the under surface of the penis. It frequently does not reach as far back as the cut skin, especially when the foreskin has been freely removed or when the mucous membrane has a tendency to curl up. The result in the majority of circumcisions is that the upper portion of the wound heals rapidly, where the lacerated edge of the mucous membrane has united to the cut edge of the skin, while on the under surface, the mucous membrane will adhere to the raw surface of the penis left by the retracting skin, but there will probably be a gap where the membrane has failed to reach the cut edge of the skin. This gap will necessarily be very small when the reflection of the mucous membrane has been complete. Where approximation of the two edges occurs union is rapid and healing by "first intention" results. Where some loss of substance occurs the gap becomes gradually filled by what is called *granulation tissue*, and the term "second intention" is given to the healing process.

Healing by first intention.

In amputating the foreskin a number of minute hair-like blood vessels which permeate the skin are

cut through. There is little or no bleeding, because the blood immediately clots, and almost at once a rim of coagulum is formed at the margin of the circumcision. Besides this the injury destroys a minute amount of living tissue known as *connective tissue cells*. The wound causes a special degree of activity in the adjacent blood vessels, so that certain important constituents of the blood flow out of the vessels and invade the cut margin where the blood has coagulated.

This invasion consists of the fluid portion of the blood—or lymph, and the solid elements called white corpuscles—or leucocytes. These latter remove the cells which have been killed by the injury, and get rid of the blood clot, probably by a process of digestion. When this is effected, the way is paved for the healing, i.e. the formation of the scar.

The naked-eye evidence of all this is to be found in the moisture or exudation on the surface of a wound. As this forms on both surfaces of a wound, the exudation is the first bond of union. The fluid portion of this exudation becomes absorbed, and what remains of it forms the scaffolding on which the scar is built up. The scar consists of new connective tissue cells which have grown into this framework, and multiplied rapidly, causing firm cohesion of the two separate surfaces.

In order that these new cells should be properly nourished they require a sufficient blood supply, and it is found that while their formation is proceeding minute new blood vessels shoot forth from the existing ones, and they grow into the soft newly developing scar tissue. Owing to this fact, free oozing of blood takes place when a healing wound is disturbed.

In the operation of circumcision it is well seen how the circulation of the blood re-acts to injury. When the mucous membrane covering the glans is exposed it looks pale and translucent, because of its scanty blood supply and its thinness. Very soon after it has been torn through, its whole character changes. It becomes engorged with blood, it becomes red and congested it loses its translucency, and at its lacerated edge the process of healing takes place as detailed above.

All scars are at first pink in colour, because more new blood vessels are formed than are required for the permanent nourishment of the part when completely healed. In the course of time these blood vessels shrink and waste away and the scar becomes whiter even than the adjacent skin. This occurs also in the mucous membrane which remains pink for a considerable time. The membrane in fact undergoes the first stage of inflammation as a reaction to the injury it has sustained. The blood vessels become enormously dilated, and its blood supply

increased. It presents the best conditions for healing along the edges where it has been torn, but the whole of its outer surface also, which, after reflection becomes opposed to the raw surface between the corona and the cut foreskin inferiorly, becomes united by a similar process to this raw area.

In those cases where the reflection of the mucous membrane has not been perfect a gap will be left between its margin and the cut foreskin, in which healing takes place by *granulation or second intention.*

The details of this method of healing are similar to the first; the discharge or exudation from the wound takes place in the same manner, but as there are not two surfaces to unite to each other, this exudation simply covers over the wound in the form of a whitish or pale yellow layer of *lymph.* The fluid discharge should be tolerably clear; if it tends to be thick or milk like in colour it indicates that there has been some accidental contamination of the wound, or that the vital powers necessary for normal healthy repair are below the average. It shows that the inflammatory re-action of the tissues which is the essential requisite for healing has been excessive. In this case not only has the wound been invaded by the white blood cells, which as previously explained, form the groundwork of the new tissue cells; but a further step has taken place. These

white cells have been thrown off the surface of the wound and together with the exuded fluid go to form "*pus*" or *matter*. All this causes delay in the healing. But eventually the wound becomes filled up by the growth of new connective tissue cells; these continue to multiply until the surface is reached, when the uppermost or epithelial layer of the cut edge of the adjoining skin grows over it, constituting a continuous skin covering.

The *defects in the healing process* may therefore be briefly summed as being due to some interference with the natural course of physiological repair. They may be comprised under the following heads.

1) Deficient vitality of the infant.

2) Infection of wound.

3) Imperfect performance of the operation especially when the tearing through and reflection of the mucous membrane has been incomplete.

These defects are to be prevented by a careful examination of the health of the infant previously to the circumcision, by the employment of Antiseptic measures, and by carefully carrying out the technique of the operation.

CHAPTER VII.

Hæmorrhage.

Trouble from bleeding is an exceedingly rare occurrence at the circumcision of an infant, because no arteries or veins are cut through. But the possibility of its occurrence, however, remains, and therefore some points regarding it should come within the information of every Mohel. It will be his duty to apply first aid, and consequently a knowledge of the principles of the treatment of hæmorrhage should be familiar to him.

There are *three varieties of bleeding.*

1st. *Capillary.* This consists of the oozing of blood from various points on a cut surface. The vessels are minute hair-like structures, and bleeding from them is invariably stopped by firm pressure. This loss of blood occurs in more or less degree at every circumcision, and in the vast majority of cases is arrested by the natural process previously explained.

2nd. *Arterial.* The distinctive sign of this kind of bleeding is that it issues forth from the wound in spurts, and not in a continuous stream. Each

spurt corresponds to a heart beat. This variety of hæmorrhage can only occur if an artery is cut through, i.e., a vessel which carries blood away from the heart to supply the tissues of the body.

3rd. *Venous.* This bleeding is due to the wound of a vessel which returns blood to the heart after it has circulated through the tissues. These vessels are called veins. The blood is dark in colour and issues from one definite spot in a continuous stream.

Treatment. For practical purposes only the first variety of hæmorrhage need be considered here. Circumcision in an infant should never interfere with an artery or vein; but in the event of this accident occuring a pledget of cotton-wool or lint must be firmly compressed with bandage around the bleeding point until the proper method can be adopted to deal with it. This consists of seizing the bleeding point with an instrument constructed for the purpose (artery forceps) and then twisting up the tissue caught in the forceps, or applying a ligature. This is a purely surgical proceeding, and as every case of hæmorrhage should without delay receive qualified medical attention nothing further need be said on this matter here.

In most cases the application of the dressing with very firm pressure suffices to arrest the inevitable bleeding of every circumcision. *The bandaging*

cannot be considered satisfactory until the blood ceases to ooze through the dressing. In adjusting the diapers it must be seen that the thighs are tied together so that they are immovable, perfect rest being indispensable for the control of hæmorrhage. This treatment is merely a mechanical aid to the natural processes which arrest bleeding, and in the vast majority of cases is perfectly successful.

There are however certain drugs which may be applied to a bleeding surface to hasten the coagulation of the blood. These are called *astringents.* These are not to be used indiscriminately as many of them injure the tissues and interfere with the healing of the wound. If pressure alone is insufficient to stop the hæmorrhage and the local application of an astringent is to be tried, the part must first be carefully washed with an antiseptic solution, so as to see precisely where the bleeding is actually coming from. Strips of lint soaked in the astringent solution are then carefully applied and retained in position by the firm pressure of a bandage.

The following are the principal drugs which may be used in this way.

1.) Compound Tincture of Benzoin.
2.) Tincture of Hazeline.
3.) Strong solution of Alum in hot water.
4.) Solution of Tannic Acid (4 grains to the ounce.)
5.) Solution of Adrenalin Chloride.

The last of these has the reputation of being the most powerful astringent known.

A solution of Perchloride of Iron is often used, but this is open to the objection of injuring the delicate living tissues.

Secondary Hæmorrhage.

Besides the bleeding which may occur immediately on the infliction of a wound, there is another variety which may take place subsequently, known as Secondary Hæmorrhage. This occurs when there is some failure in the process previously described, by which the wound heals. The coagulum is disturbed and the vessels are practically re-opened, or the coagulum *becomes softened through the action of an infective agent*. As a rule secondary hæmorrhage indicates some form of infection.

Often in changing the dressing there is a minute amount of hæmorrhage. This is due to injuring the developing blood vessels in the newly growing scar tissue.

Hæmorrhage due to constitutional conditions.

Some infants are born with a tendency to bleed, without any evident cause, either from the nose, bowels, or in the skin. The separation of the navel

may be followed by bleeding. Many of these cases are due to hereditary disease of one character or another. Of these, there is one which requires special mention, because when fatal hæmorrhage has occurred after circumcision it has been due to it. This is *Hæmophilia*. Subjects of this disease are called *Bleeders*, and it usually only affects males. It runs in families, one or two members may be affected while the rest are free. The females in a family of "bleeders", though they may not suffer themselves, transmit the disease to their children. In this condition the slightest injury will start profuse hæmorrhage. The use of a toothbrush may be sufficient to cause severe bleeding from the gums. If the family history of any child reveals the presence of this disease circumcision must not be performed. Should the operation have taken place in ignorance of the condition the difficulty in controlling the hæmorrhage, and its recurrence if at all relieved will at once confirm the presence of Hæmophilia. The nature of the bleeding in this condition is that referred to before as *Capillary*.