

position inside the nose as described under Fig. 3. In the author's opinion this splint is indispensable in the vertical impaction fracture, and reassuring and oftentimes helpful in the lateral impaction type. It was used in about 70 of the 100 cases under discussion. With careful nursing, cleansing of the nostrils, and a liberal use of ephedrin spray the nasal airway is kept open and the splint retained in position for 4 to 10 days. Frequently a nasopharyngitis develops, but no serious complications have been encountered.

External splinting.—To keep down post-operative œdema, to prevent re-injury, and to give the patient an added sense of security, an external, gauze-wrapped, dental impression compound splint is made as follows for placement over the dorsum of the nose. The eyebrows and nose are vaselined. A wafer of Kerr's dental impression compound (obtainable from any dental supply house) is placed in *very hot* water for a few moments, until it becomes quite soft and plastic. It is rolled and kneaded into a homogeneous mass and quickly shaped into a

butterfly pattern (Fig. 6). The upper wing is flattened out on the forehead above the root of the nose and the lower wing is moulded over the dorsum of the nose. In this position, gently resting on the forehead and snugly gripping the nose, it is chilled with ice compresses. It becomes hard and brittle when cooled and can be removed from the nose without distortion. A gauze dressing of several thicknesses is spread over the nose, the splint placed on the gauze, and the gauze edges folded up around the splint. The gauze provides added gentle pressure to the injured organ, a dressing for lacerations, and prevents softening of the compound by body heat. The whole gauze-wrapped splint is secured by double adhesive strapping passing completely around the head and with the lint left on for the hair-bearing areas. This is best kept in position from 4 to 5 days, as œdema tends to make its appearance if the splint is removed earlier.

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TATTOOING OF THE CORNEA*

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CASE REPORT

ON August 21, 1936, Miss B.F., 27 years old, asked my advice for a leucoma of the left eye. She said that at the age of four years she was wounded by a fork which perforated the globe in its anterior part. The inflammatory reaction was very severe, and after infection a large ulceration of the cornea started. This ulceration lasted more than two years before complete healing took place.

On examination I observed a vast leucoma of the left cornea which had spread, in a relatively symmetrical manner, to almost all the membrane. At its periphery, where it is a naturally thinner, the whitish cicatrix invaded the deep parenchymatous layer. In the inferior segment there was a strong adhesion of the iris to the cornea. The anatomical convexity of the globe was not modified. Vision was reduced to light perception. The ocular tension was normal. A permanent divergent strabismus of the left eye of 10° existed (see Fig. 1).

The iris of the right eye was pigmented in brown. After correction the vision of this eye was excellent. R. E. 15° - 0.75 - 0.75 V-1.

For this leucoma from the æsthetic point of view, I proposed a series of tattooings with China ink. This advice being accepted, the first operation was fixed for October 7th.

From October 7, 1936, to September 29, 1937, I performed eight tattooings of the cornea, following

exactly the same technique for each of them. At first I should say that my China ink is particularly pure, having been bought by myself in Peking at the time of a voyage in the Far East.

While I anæsthetized the eye by means of a solution of cocain I reduced to an impalpable powder a small quantity of a tablet of ink. This powder was then dissolved with a drop of distilled water which gave it the consistence of a clear paste. When the local anæsthesia of the cornea was terminated, I immobilized the two eyelids with a speculum, and began the tattooing at the pupil. This one, instead of being located in the middle of the globe, was placed rather slightly to the left, towards the internal canthus, in order to correct a little, from the æsthetic point of view, the divergent strabismus. I used a single needle to introduce the ink between the layers of the cornea, more or less cicatricial, in giving it an oblique direction. The tattooing of the pupil was easily done because at this spot the leucoma was very thick. As to the periphery, where the fibrous tissue was much thinner, I proceeded more delicately. After this first operation the patient returned home without any eye drops or bandage.

The sequelæ of this small intervention were absolutely normal. As my patient was very busy with her work, she came back a month later for another tattooing. This was repeated seven times at irregular intervals, approximately every five weeks. I must say that during these tattooings I have had no unfortunate complications under the form of ulceration of the cornea, or any thing else, during the course of the

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treatment. On December 29th, that is to say, three months after my last intervention, the patient had the appearance indicated in Fig. 2. As we notice on this photograph, the leucoma now is entirely tattooed. At first it is even difficult to see which one of the two eyes has been operated on.

If now we cast a rapid glance on the different methods employed up to date to make disappear or to attenuate the stains of the cornea we see that the first attempts go back to great antiquity. Galen used the extremity of an incandescent stiletto with which he cauterized the leucoma, and applied afterwards a mixture of gallnut or bark of grenadier, with a salt of copper. This method could give but a very weak result.

It is to my regretted master, de Wecker, to whom belongs the great merit for having had the idea, in 1869, of tattooing the leucomas of



Fig. 1.—Aspect of the patient with her leucoma.

Fig. 2.—Aspect of the patient after the tattooing of the cornea.

the cornea with China ink. In 1870 his first essays were published by one of his pupils, Pomier. After cocainization of the eye de Wecker covered all the part to be tattooed with a thick solution of ink, and inserted the pigment into the corneal tissue with a grooved needle handled obliquely. This procedure was repeated about every fifteen days, until a satisfactory result was obtained. Later on, he slightly modified his technique, using a stick of China ink with which he prepared a soft paste, which was then presented to the operator on a spatula, and gradually introduced into the leucomatous cornea with an ordinary needle. Thus he could better control his tattooing, beginning always by the shaping of the pupil. In the year 1900, when I was chief of clinic to de Wecker, I saw remarkable results obtained by his assistant, Masselon.

After de Wecker, who had advocated China ink for the tattooing of corneal leucomas, certain authors advocated in their works modification of technique, and proposed a considerable number of colouring substances to attain the same object.

Taylor uses a bundle of fine ordinary needles. As the oblique direction is the best one for the introduction of the colour into the layers of the cornea, I strongly doubt that this process is to be recommended, especially for tattooing over the pupil.

Nieden employs the Edison electrical needle which allows him to operate more rapidly, and perhaps more regularly. He uses an extract of choroidian pigment which, according to him gives a better result than ink.

In order to design a pupil as perfect as possible, Armaignac has devised a small funnel fixed to the cornea by means of three small points. After having placed in this instrument a certain quantity of China ink, he proceeds to the tattooing with a needle. He claims to rapidly obtain thus a perfectly round pupil in one sitting. The remainder of the leucoma is then coloured in its turn.

Froelich and Czermak use the Von Hippel's trephine to delimit the situation of the pupil. Holth, although a partisan of this method, has recourse to a punch of a variable diameter to trace the pupillary contour. After this first step the central superficial layer of the cornea is excised, and some scarifications or punctures are then practised. When the hæmorrhage is stopped by means of adrenalin, the tattooing is finally made with a needle, this time soaked in China ink.

Rollet makes small injections of a solution of China ink directly into the superficial layers of the leucoma.

Aubaret employs simultaneously two lancets for the introduction of the China ink.

Finally, Morax treats the leucoma not with tattooing but by splitting the corneal tissue into two vertical layers. He leaves, however, a flap sufficiently large to assure its nutrition. Then, he introduces the colouring substance under the pedicle flap, and applies a compressive dressing over the eye. I doubt if this method is the best one for the treatment of leucomas of the cornea.

In order to imitate as perfectly as possible the iridian tint of the good eye, certain authors have tried out about twenty colouring substances to replace China ink at the time of the tattooing of corneal leucomas. Needless to say, these sub-

stances must be perfectly aseptic before their use. Moreover they should be absolutely opaque and insoluble. We can procure a powder of choroidian pigment manufactured by Merck, of Darmstadt.

Knapp, of Basel, in 1925, obtained good results in tattooing after first scraping the leucoma, and applying afterwards a 2 per cent gold chloride solution. This solution can however be increased in strength to 5 per cent.

Krautbauer, though adopting the same technique, advocated in 1928 the use of a platinum chloride solution of 2 per cent.

Finally certain authors employ a silver nitrate solution after scarification of the leucoma.

In so far as I am concerned I have always been faithful to China ink, and believe that in experienced hands this ink, employed with prudence, can give excellent æsthetic results. With regard to corneal infection, we know that in a general manner this substance is sterile, and when contamination occurs, we must blame its preparation. Moreover, if the tattooing has been well done, there is no elimination. Contrary to what Chevallereau and Polack say, I have never observed, following my numerous colourings of the cornea with China ink, small zones of infiltration of the area of the tattooed

surface. Holth advises to try the tattooing in one sitting. I do not share this opinion, but I rather believe it is better to intervene many times. Thus the inflammatory reaction is of a shorter duration, since it disappears two or three days after the tattooing.

All leucomas do not equally respond to intervention, which must be done only on those which present old, solid and flat corneal cicatrices. As to the adherent leucoma, we must practise the tattooing with a great precaution. For this small operation there is no need to use fixation forceps, as advised by certain authors.

It is not necessary to use pilocarpine after the tattooing, but we must especially beware of atropine, because Tyson has observed a glaucoma after having employed this mydriatic.

Placing a bandage over the tattooed eye is not indicated; ordinary coloured glasses are amply sufficient.

In conclusion I shall draw the attention a last time to the importance of using for the tattooing sterile, very opaque and insoluble substances, and giving to the needle an oblique direction. Thus the stable coloured matter penetrates more deeply into the leucomatous tissue, and offers for the same reason a better guarantee against elimination.

CONGENITAL HERNIA INTO THE UMBILICAL CORD; TWO CASES, ONE ASSOCIATED WITH PERSISTENT CLOACA

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CASE 1

THIS was a male baby, about fifteen hours old when admitted to the Winnipeg General Hospital. It was normally delivered, born of healthy parents. The mother was thirty-two years old, para II, gravida II, the previous child having been normal.

The baby was born on January 13, 1938, at three o'clock in the morning on a farm in rural Manitoba. Transportation to Winnipeg required a ten mile ride by sleigh in below zero weather, one hundred miles by rail, and taxi conveyance to the hospital. The local physician, who had skilfully conducted the accouchement, prepared the tiny patient for its journey by wrapping it in cotton-wool and blankets, and placing it in an ordinary parcel basket equipped with hot water bottles. This made a comfortable and essentially private conveyance. A male relative accepted the responsibility of the journey. At the expected time a basket was calmly deposited on the admitting office counter, and from it was extracted the little patient, apparently none the worse for its unique experience.

Physical examination revealed a robust, full-term infant, weighing eight pounds and thirteen ounces, whose only abnormality was a large hernia into the umbilical cord, about the size of its head. This hernia contained practically the whole of the small bowel, and was

covered only by a thin transparent membrane, through which the loops of intestine and peristalsis could easily be seen. The colour of the sac was a pearly grey, while the intestinal walls were a healthy red. The neck of the sac was about three inches in diameter, and a small cuff of skin about one inch wide was carried on to it from the abdominal wall. The membrane, though intact, showed local evidence of abrasions and peeling of its outer layer.

Since the child presented no other congenital anomaly an immediate operation was decided upon. A normal passage of urine just before operation relieved any anxiety of the bladder being abnormal.

Ether was administered as a general anæsthetic in the usual manner, the period of anæsthesia being fifteen minutes. Observing strict aseptic technique, the loops of bowel were with difficulty reduced into the abdominal cavity. The sac was then opened and the abdominal wall closed with one continuous chromic cat-gut suture, catching the deep fascia along with the peritoneum. No attempt was made to separate the various layers, as this would only prolong the operation. The cuff of skin was then trimmed so as to cover over the wound, and this was closed with deep interrupted silkworm gut sutures. A small binder was applied to support the