INJURIES TO THE CHILD'S HEAD DURING DELIVERY.*

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In ordinary practice, depressions of the skull caused during delivery are not very common, but in our hospital work in Glasgow we see a good many of them. As a rule, they occur in contracted pelves, and are caused by pressure of the promontory, but I have seen two cases in normal pelves. In one of these the depression was very great. The mother's abdomen was so pendulous that the head would not enter the brim. The child, which was very large, was delivered with axis-traction forceps. The frontal bone and part of the parietal of the right side were deeply furrowed. The child seemed to suffer no inconvenience, and was quite well when it left the hospital. The depression had risen a little. I cannot say what the ultimate result may be, but I am afraid imbecility or epilepsy may possibly develop.

In the second case with a normal pelvis, the depression was at the back part of the right parietal bone, and was probably caused by the pressure of an ischial spine. In this case the depression has entirely disappeared. As a rule the frontal bone has been the one affected, but besides the depressions already mentioned I have seen several on the parietal after breech deliveries. In two of these, which I have been able to follow up, the depressions have risen, but are, after three years, still quite traceable. The children seem all right.

Fracture may occur during delivery and yet there may be no evident depression. I have seen this in two cases. In the first the delivery was a difficult forceps case through a contracted pelvis (C.V. 3in.). The child seemed all right, and although there had evidently been considerable pressure upon the frontal bone there was no noticeable depression. A few hours after birth the child became restless, moaned a good deal, and died in 17 hours. At the *post-mortem* examination we found a fracture of the left frontal, involving the orbital plate. The brain was lacerated in the anterior part of the frontal lobe.

In the other case the child was delivered through a pelvis with a true conjugate of $3\frac{3}{4}$in. There were no signs of respiration, but the

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heart beat for five minutes. The *post-mortem* examination revealed considerable lateral compression of the head, the right parietal overriding the left. There were slight hæmorrhages over the frontal bones, and a complete fissured fracture was found in the lower part of the left frontal, about ½in. above the orbital plate, running out horizontally to the coronal suture. Inside the skull there were small hæmorrhages opposite the points of application of the forceps, as well as an effusion of dark, venous blood, of moderate size, lying over the tentorium on both sides. The following case was one of the most marked depressions of the frontal bone which I have ever seen. The mother of the child was a small, rickety woman, with a diagonal conjugate of 4in. Her first child had been delivered by forceps. In this, her second confinement, she was delivered in the same way by Dr. Harrington, one of my residents. I was present and gave the chloroform. Considerable traction was required, and as the head passed the promontory, we were both aware of a thud. The child soon cried, and seemed to suffer no inconvenience from the very marked depression of the left frontal bone. I applied very firm pressure to the head but failed to raise the depression. As the patient lived in a single room, and the surroundings were anything but sanitary, I decided to leave the child until the mother could accompany it to the hospital. The mother made a good recovery, and she and the child were admitted to the Maternity Hospital on 23rd August, when the child was 11 days old. The child was quite well, but the depression had not risen. Next day, after Dr. Lindsay had taken photographs and a cast of half the head, I reflected about an inch of the scalp from the back portion of the frontal bone, and made a small incision through the bone, about a quarter of an inch in front of the suture, then passed McEwen's periosteum elevator between the dura mater and the bone, and raised the depression. The incision was made away from the suture, as the dura mater is always adherent at the sutures, and I wished to avoid cutting it. The bone was fairly hard. When I passed the elevator in there was a gush of blood-stained serum. I was surprised at the amount of force required to raise the depressed bone. The wound in the scalp was closed with stitches. The child stood the operation well, but took nearly as much chloroform as an adult. The scalp wound healed by first intention, and the child kept perfectly well.

There is still slight flattening of the bone, but the arch is gradually rising. A few days after the operation the arch was well up, but it sank a little again. If the operation had been done immediately after the birth, I think the arch would have been completely

restored. It is a recognised fact that injury to the head during birth may have a deleterious effect upon the brain of the child. Epilepsy or imbecility may develop; we should therefore attempt to relieve the pressure upon the brain. Dr. Munro Kerr has pointed out the fact that a depression of the skull may be raised by applying pressure to the head antero-posteriorly in an oblique diameter at right angles to the depression. In some cases the indented portion will rise just as it does in a bowler hat, but in others, as in the one just narrated, it will not. In this case the inner table was probably fissured, and that may account for the failure. It is a simple procedure and should certainly be tried. If it fails we should not hesitate to cut down through the bone and raise the depression at once. If this be done with aseptic precautions there is no risk to the child. A strong director would do to elevate the bone with.

Besides injuries to the bones we may have other serious conditions arising such as cortical or meningeal hæmorrhages, traumatic keratitis, hæmorrhage into the optic nerve, retina, or anterior chamber of the eye. Sub-conjunctival hæmorrhages are exceedingly common even in normal labours, but they are of no consequence. Cortical or meningeal hæmorrhages are liable to cause death, and if the child survives there is considerable risk of permanent injury to the brain. We have found hæmorrhages in a number of cases where the bones were intact. The following two cases were, I think, of this nature.

Nearly seven years ago I delivered a male child by turning on account of prolapse of the cord. The head was large, and I had considerable difficulty in delivering it by suprapubic pressure and traction. After doing artificial respiration for half an hour I managed to get the child to breathe, but it was another half hour before natural breathing was fully established. In a few hours he began to have convulsions, and these continued for about 36 hours. I tried bromide but it had no effect, and I then resorted to chloral, which I repeated in 2½ grain doses every 15 minutes until he had taken 15 grains. The convulsions, which had laterally been almost continuous, then ceased, and the child slept for three days. He could be roused sufficiently to swallow a little milk, and this was done every few hours. His urine, when boiled, gave off the odour of chloroform. He is now, at the age of seven, able to walk with difficulty, and can only speak a few words. He is hopelessly imbecile.

The second case was that of a 12lb. child, which I delivered with Milne Murray's axis-traction forceps after other instruments had

failed. I had been sent for to do craniotomy. This child was long in walking and speaking, but I think he will outgrow the condition. His mother does not see anything wrong with him, but I am quite sure his mental development has been delayed.

In the treatment of meningeal and cortical hæmorrhages there is very little we can do except leave the condition to nature. If there is a fracture we might trephine, but in cases where there is no fracture or depression we have no guide as to the position of the hæmorrhage.

Injuries to the eyes. In high forceps deliveries one blade of the instruments usually lies over or near one of the eyes. As a rule, beyond some bruising there is no injury to the part, but occasionally the eye is more or less damaged. In difficult deliveries the eye may be enucleated, but this accident is fortunately rare. I have only seen this accident twice, and in both cases the children were dead. In one of them, in which the pelvis was not contracted, Dr. Reid's forceps had been used, and in the other Milne Murray's, but in the latter case the pelvis was badly contracted. As I have already stated subconjunctival hæmorrhages are quite common, even after normal deliveries, but they quickly disappear and are of no consequence. Hæmorrhage into the anterior chamber of the eye is occasionally seen. Retinal hæmorrhages and hæmorrhages into the optic nerve may also occur. We have found these in one or two cases *post-mortem.*

The condition to which I wish especially to direct attention is that of "traumatic keratitis in the new-born," as it has been called by Dr. W. Ernest Thomson, in his report of the cases to the Ophthalmological Society of the United Kingdom.

On January 21st, 1901, the house surgeon in the Maternity Hospital drew attention to the eye of a child which we had delivered the night before. The child, which weighed 9¼lbs., had been delivered by Milne Murray's axis-traction forceps, through a true conjugate of 3½ inches. A few hours after delivery the house surgeon noticed that, in addition to some bruising of the right temple and upper eyelid, where the blade of the forceps had been applied, the cornea was more or less opaque. The left eye was clear. As only the eye which had been pressed upon was affected I concluded that the opacity had been caused by the pressure, and that it was not a congenital condition.

Dr. W. Ernest Thomson examined the case and followed it up subsequently. He was of the opinion that it was a traumatic keratitis caused during delivery. Since the discovery of this case we have

been on the watch, and our vigilance has been rewarded by the discovery of at least half a dozen more. I have asked several of the former physicians of the hospital, but none of them had observed the condition, and yet it must have occasionally occurred. So far as Dr. Thomson could find no cases had previously been recorded. They must have been seen by ophthalmic surgeons during the early months of infant life, and by them considered as congenital. Dr. Thomson reported three cases (two of mine and one which had come under Dr. Andrew Wilson's care at the Eye Infirmary) to the Ophthalmological Society, and since then another case has been shown to that Society by Dr. L. V. Cargill.

The following are Dr. Thomson's notes of my two cases taken from the recently published 22nd vol. of the *Transactions of the Opthalmological Society*:—

Case 1. Dr. Thomson reports that on January 23rd (*i.e.*, three days after birth), "there was subconjunctival ecchymosis in both eyes, but the left cornea was perfectly clear. The right cornea was hazy, to the extent of making observation of the pupil difficult, except on focal illumination, the opacity being slightly denser in the centre than in the periphery; surface lustre was lost, and, on magnification, the opacity was seen to be rather superficial, and composed of flocculent, closely-packed spots. No vessels or tracks of vessels were visible. The pupil was active."

"On the 27th there was decidedly less peripheral opacity, though in the centre it was distinct, and the surface dull. The pupil was dilated, but no details of the fundus could be made out. I expressed the opinion that the case was traumatic and had occurred during labour." On March 11th the case was again seen by Dr. Thomson, and he reports:—"The opacity had undergone a remarkable change. When last seen there had been a general corneal haze, denser in the centre. Now there was a white linear scar extending almost vertically downwards across the cornea and just to the temporal side of the middle line, with a second sharp linear opacity parallel to it. On each side of the principal sharply-defined line was a haze of much less intensity, most marked near its centre. The surface of the cornea was smooth."

When the child was a year old, Dr .Thomson reports:—"The opacity is disappearing, but is still quite distinctly visible. The treatment has consisted in the use of yellow oxide of mercury ointment."

Case 2. This child, a female, weighing 7 lbs., was delivered with forceps through a true conjugate of $2\frac{3}{4}$ inches. There was rather a

deep depression of the left frontal bone, and the left eye bulged forwards. The pupil was dilated and the reflexes gone. The right cornea was opaque all over. A large blood-clot soon filled the left conjunctival sac, and it looked almost as if the eye had been dislocated and destroyed, but on removing the clot the eye was seen to be intact, except that the cornea was opaque, but to a lesser degree than the right one.

Dr. Thomson reports:—"When I saw the case, four days after birth (March 3rd) the left upper lid was swollen, and the conjunctiva chemotic. The cornea presented a faint haze, with very slight loss of polish. There was a depression in the left temple said to be caused by pressure of the sacral promontory. The right eye, in the neighbourhood of which the forceps blade had been applied, presented an appearance almost exactly similar to that described in the first case at a similar stage. The cornea was cloudy all over, although less so than in the first case, and the opacity was made up of minute discrete spots. Surface lustre was lost. There was no trace of corneal vascularity. Subconjunctival ecchymoses were present but no chemosis. Dr. Leslie Buchanan also saw the case at this period, and agreed in the diagnosis of traumatic keratitis.

"On March 11th, eight days later, the child was seen again. The *left cornea*, which at first was only slightly hazy, now presented a linear scar in almost exactly corresponding position to that in the right eye of the first case. Its density was hardly so great, and it was slightly further to the temporal side. The right cornea was quite different. When first seen, the opacity was uniformly over the cornea, and rather less in density than the early opacity of the first case. Now it had become very much denser; so dense that the pupil could only be made out with great difficulty. This patient has not been seen again."

In Dr. Wilson's case there was a similar opacity. It was first seen five weeks after delivery, and recognised as similar to my cases. The delivery had been a difficult forceps one through a contracted pelvis.

In Dr. Cargill's case a similar condition existed. The child had presented by the brow and had been delivered with forceps.

In one of my last cases we were unable to resuscitate the child, although its heart beat for some time. The delivery had been through a C.V. of $3\frac{1}{2}$ in. in the Walcher position. There was probably a hæmorrhage into the brain. The opacity of the right cornea was very dense, as seen immediately after delivery. Drs. Thomson and Leslie Buchanan examined the eye microscopically, and they

have furnished a detailed report of the condition to the Ophthalmological Society. They found that the posterior elastic lamina of the cornea was ruptured in several places, and that there was a certain amount of laceration of the posterior layers of the corneal tissue proper. The opacity seemed to be due to the action of the aqueous upon the corneal tissue. The fractures of the posterior elastic lamina were vertical in direction, hence the vertical bands of dense opacity.

Dr. Thomson has recently been appointed ophthalmic surgeon to the Maternity Hospital, and he is carefully investigating all abnormalities in the eyes of the new born. I am confidently looking forward to valuable results from his labours.