

The Obstetrical Extractor. By JOHN EVANS, M. D., Professor of Obstetrics, &c., in Rush Medical College, Chicago, Ill.

THE instrument to which I call the attention of the Association has recently been described in the *North Western Medical and Surgical Journal*; but I desire to lay it before the profession of the whole country, through their assembled representatives, that it may be thoroughly examined, and, if approved, its usefulness extended.

It is designed for an extractor in parturition, as its name implies. The only successful instrument that has before been proposed for this purpose is the obstetrical forceps, the imperfections of which are familiar to all obstetricians.

That there has always been great deficiency in the forceps is recorded in the innumerable modifications to which they have been subjected.

The Extractor, it is hoped, will be free from many, and the most serious, of the objections to the forceps.

The principle upon which it operates is plain and simple, being that of placing a band around the head of the child above its largest diameter, and fixing the ends near together, by steel fingers, so that it cannot be drawn off. From this band straps pass down to the vertex and out through the os externum, to be grasped by the hand, and upon which the extractive force is exerted.

The band is applied after the manner of passing the ligature around a polypus by Gooch's double canula, as will be more readily understood after describing the instrument.

Figure 1 shows the instrument, and its different parts, and Fig. 2 its position upon the head when applied.

Fig. 1.



- A. One finger curved as when applied to the head. *b b*. Joints.
- a*. Ring.
- B B*. The fingers extended.
- C*. The sliding ring that slips on the handle to hold the fingers in apposition.
- D*. The band that encircles the head.

E. Meshes of net-work. *c c.* Transverse braid forming them. *eeeeee.* Straps of silk braid passing from the band by which the extractive force is applied.

F F. Small silk braid to draw the band into the ring of each finger. *d.* Knot made by tying the straps together.

The Extractor consists of two blades or fingers of steel that are exactly matched, each 11 inches long, 5 inches of which is handle and 6 inches finger; a sliding ring; a silk band passing from one finger to the other, 9 inches long by 1 inch wide, and 9 straps of silk braid passing from it downward between the fingers, 18 inches long, and $\frac{1}{4}$ of an inch wide.

Attached to each finger, and extending from one to the other, *c c*, one and a half inch below the margin of the band, is a braid to which the straps are sewed fast, forming with them a net-work.

The handles are $\frac{5}{8}$ ths of an inch wide, and $\frac{3}{16}$ ths thick, uniform and straight the entire length, so that a sliding ring can be passed over both when their edges are brought together, so as firmly to fix them side by side, as at *G*, Fig. 2.

The other part forms the finger which has a curvature to fit the convexity of the child's head. It is $\frac{1}{4}$ th of an inch thick at the junction with the handle, for here the greatest strain comes on the instrument, but rapidly becomes thinner towards the end, until it is as much attenuated as it can be, to allow of two strong hinge joints (*b b*) in it. It diminishes also in width from $\frac{5}{8}$ ths of an inch at the handle to $\frac{3}{8}$ ths at the end, where it is terminated by a ring, the hole (*a*) through which is $\frac{1}{2}$ of an inch in diameter. The edges of the fingers are rounded and the hinges made so that they present no roughness. They allow flexion enough to adapt the finger to any part of the head upon which it may rest at the time, and extension enough to make it as straight as is desirable in the introduction of the instrument. The slide holds the handles and fingers parallel and firmly together, so that their ends cannot separate.

The band (*D*) is firmly attached to the end of each finger at the ring, and by a few drilled holes below it.

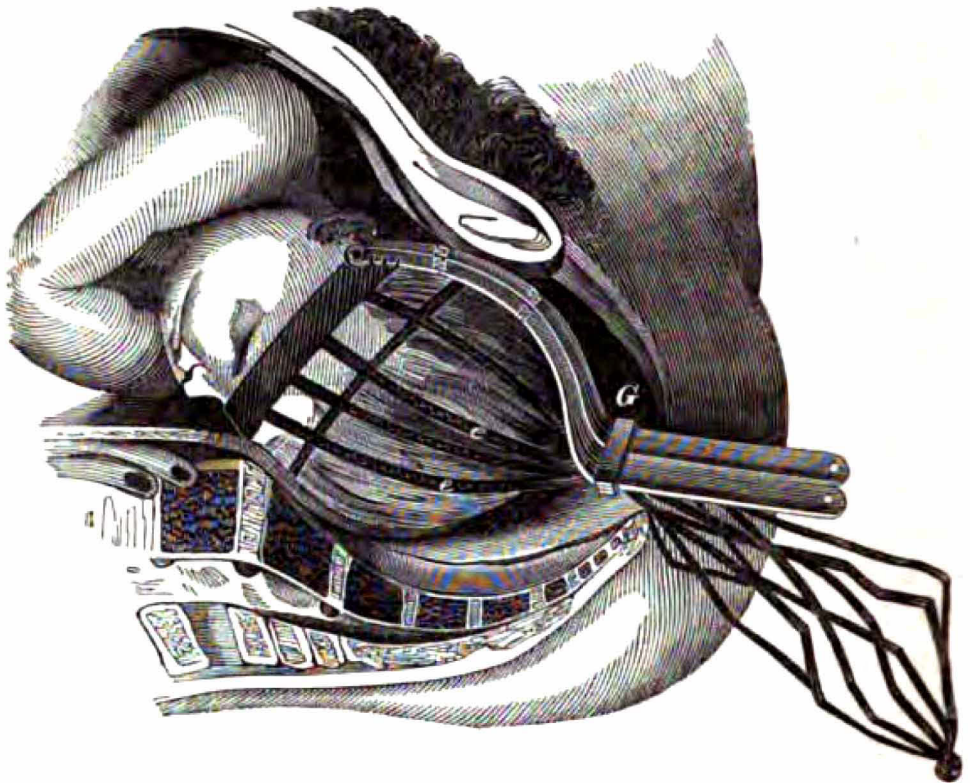
The net-work (*E*) is designed to keep the band from slipping over the chin of the child, and to keep the straps in their places.

The straps (*eeeeee*) are firmly sewed to the margin of the band, and pass down so as to reach some distance below the ends of the handles. These may be tied in a knot as at *d*, Fig. 1, to form a loop which may be grasped by the hand in applying force, and which will keep the slid-

ing ring convenient while the band is being carried around the head.

The thread or fine braid (*FF*) is to draw the band into the rings at the ends of the fingers, so that it will be carried entirely up during the introduction of the instrument.

Fig. 2.



To prepare the Extractor for application, draw the band through the rings, half of it to each; slip the sliding ring on; extend the fingers; tie the small threads through the holes in the handles, and dip the end first in oil, and then immerse in water until it is blood warm.

To introduce it, pass two fingers of the left hand to the presenting part of the head of the child, or to the os uteri; take the instrument, as prepared, by the handles, holding the straps in place, parallel with the fingers of the instrument, and pass it within the uterus, with the palmar surface of the fingers of the instrument next the head. Then, as it is passed up, flexion of the fingers will take place from traction on the straps and the pressure of the uterus, so as to keep them in contact with the head, as if grasping it. With the fingers of the left hand examine and adjust the end of the instrument so as to give it a right direction, then gently press it up

until the curve fits upon the head, as seen in cut No. 2. When the end with its bunch of silk passes over the greatest diameter of the child's head, the resistance gives way and it becomes free. In this process, there is no danger of injuring either mother or child, if done with moderate prudence, as the end of the instrument is protected by the bunch of silk band drawn into the rings.

Next, the threads that hold the band thus are loosened, and the slide taken off. One handle is now grasped and gently carried around the head from its fellow to the opposite side. As the finger of the instrument is carried around the head, the band is paid out from the ring, at the end of the finger, and at the desired place.

Care must be had that none of the straps are pulled at this stage of the process, lest they draw the band too far down. The other handle is next grasped and carried in the opposite direction until it meets its fellow. During this part of the process, two points should be attended to to facilitate the application. First, to relieve compression between the head and any part of the pelvic walls, the former may be pressed upward. And when the instrument is passing over the occiput, if passed far up, the end of it may strike against the child's neck and make an obstruction. If this occurs, slightly withdrawing the handle will obviate the difficulty.

When brought together, the slide is to be placed upon the handles again, and the straps adjusted with the fingers, so as to be about equidistant from each other, gathered together where passed through the staple upon the sliding ring, and drawn down tightly. Thus applied, the slide on the handles holds the fingers of the instrument parallel to each other, and fixes firmly the ends near together so that the band cannot give or slip off of the head.

The instrument, thus applied, as seen in Fig. 2, is ready for the application of extractive force, which may be made, as occasion requires, either directly, obliquely downward, upward, or to either side, by pulling more forcibly the opposite straps. If the head needs its position altered, it gives us the best possible power for accomplishing it.

The first application of the instrument was made in the early part of last March, since which time it has been considerably modified and improved to its present form. I will relate the cases in which it has been used:—

CASE I. An Irish woman in the care of a midwife had been in labour twenty-four hours with her first child, when I was called. I

found the head engaged in the superior strait, but not descended so far as to press upon the pericranium. It was a left occipito-anterior presentation. The uterine contractions were very strong, but, for three hours that I attended, did not in the least advance the child. I placed the patient in the usual position for applying the forceps, and proceeded to apply the Extractor after the manner already described. This was done with such entire facility that I at once became satisfied of the utility of the invention; my only fear having been in reference to difficulties in its application. The labour was speedily and happily terminated without apparently increasing the patient's suffering over that that is natural, and with entire safety to both mother and child.

CASE II. Miss ——— had been in labour with her first child twenty hours, in care of a root doctor, when I was called in counsel with Prof. Herrick, in the case. We found the os uteri well dilated, the contractions forcible, and the head engaged in the superior strait, with the occiput forward and to the left. No advancement had been made for several hours, when it was determined to apply the Extractor. The obstruction arose from the large size of the child. The application was made as before, and delivery as speedily and safely effected.

CASE III. Mrs. B. had been in labour for ten hours; the pains were beginning to grow weaker, and the advancement of the child, which presented naturally, had ceased for two hours. It was simply a case of tedious labour from inefficient uterine contractions, and I determined to apply the Extractor, if possible, without the patient's knowledge of it. Of this intention I apprised her mother, who furnished me the means of preparing the instrument in an adjoining room. As the patient lay in the usual position for delivery on the left side, I applied the Extractor without causing so much pain as to lead her to suspect that I was using an instrument; though, thinking I made an unusual examination, she inquired if anything was wrong. The delivery was effected speedily, and with safety to both mother and child. In this case, the band slipped over the chin of the child, after which I put the net-work below the band to prevent the like accident from occurring in future.

CASE IV. An Irish woman who had been in labour twelve hours, in care of Prof. N. S. Davis, was much exhausted from long con-

tinued and violent expulsive efforts. The head was engaged in the brim of the pelvis, but had not descended into the concavity of the sacrum, and had made no advancement for several hours.

In attempting to apply the Extractor, I found some difficulty in approximating the handles closely enough to receive the slide, but found that it was occasioned by the band not having been carried far enough up, as was proved by the instrument's coming away upon the application of force. The reason it was not carried high enough at first was a deception as to the actual position of the head, occasioned by great tumefaction of the scalp. A subsequent trial succeeded perfectly, and the delivery was accomplished without farther difficulty and with entire safety to both mother and child.

CASE V. Mrs. A. had been in labour with her fourth child fifteen hours, in the care of Dr. J. S. King of Chicago. I found the head entirely above the superior strait of the pelvis. Dr. K. observed that, although the soft parts seemed to be well relaxed and the contractions strong, there was no tendency during the pains to advancement of the head. The pains had been strong, without altering the position of the child, for about eight hours; but the intervals between pains were now longer, and the contractions less forcible. The os uteri was dilated to two inches in diameter; the occiput presented nothing upon the symphysis pubis. The Extractor was applied without any difficulty, and the delivery effected safely to mother and child within fifteen minutes from the time the application was commenced. The head of the child scarcely presented a trace of the instrument in any case in which it has been used. The only mark it has yet made has been slight redness and temporary depression of the skin, where the band and straps were applied.

In this case, the mother did well, but the child died in about twelve hours of morbus ceruleus.

Thus far, the Extractor has answered every expectation I had entertained. But, as the test of experience has been limited to the cases above given, we will glance at its adaptations and see what indications it will probably fulfil.

As it is capable of being extended beyond a right line, it can be passed around the bulge of the head at any point in the maternal passage; and from its small size, flexibility, and smoothness, with great facility.

These traits will also enable the operator to apply it even before the os uteri is dilated beyond the size of a dollar. The bunch of

silk braid at the end of the instrument, made by the band being drawn into the rings, makes a perfect protection from its being pushed against the uterus or child in a way to inflict injury.

The parts applied to the head, being a kind of silken net-work, are in no danger of injuring the child.

The application of force involves but little compression of the head, which is left free to be moulded to the shape of the passage.

The straps being so soft and yielding, and their adaptation to the head being so close, there is no danger of contusion or laceration resulting from them. Even when the os uteri is but slightly dilated, the straps would be in no danger of injuring it.

The head is so completely grasped by the instrument that we can apply our force so as to make but little pressure on the mother's parts, in advance of the head.

The control the operator has over the direction of the power applied is so complete that I can scarcely conceive of a necessity for anything better in that respect. In this respect, there can be no comparison between it and the forceps. In applying extractive force by the Extractor, the operator need not be in dread of its slipping off, for, if it should, it could scarcely do any injury to mother or child.

There is no precise place on the head where the instrument must be applied, as there is no danger of its injuring any part. The small size of the instrument (its weight entire is eight ounces) renders it convenient, its simplicity understandable and safe; and its cheapness commends it especially to those who have not been able to procure instruments on account of their price.

The cases to which it is applicable are:—

1st. All those in which the forceps are now recommended, excepting when the head may be so firmly locked between opposite points of the pelvis that it cannot be moved by compressing it upward.

2d. All labours protracted in the second stage, where it is possible to deliver with safety to the child. Being applied with little pain or danger, there can be no excuse for allowing a patient to suffer the agonizing throes of labour, hour after hour, without progress, as is done in almost all such cases now, should the physician have the Extractor at hand.

3d. In labours obstructed at the superior strait of the pelvis, it will be especially applicable, for the higher up the head is at the time, the easier will be the application of the instrument. This

will be manifest, if we consider how readily it can be passed up by the side of the head, when the fingers are extended, and that the only obstacle likely to interfere with its application is in passing the fingers from one side of the head to the other. The higher the head is up, the more loosely it floats, and, of course, the less resistance of this kind will be offered.

4th. Cases requiring speedy delivery at any time, either before labour has commenced (for the os uteri towards the full time is always dilatable enough to allow of its application), or during its progress, as is sometimes desirable in convulsions, hemorrhage, and the induction of premature labour, to prevent craniotomy.

By applying the Extractor, immediately after the separation of the placenta, in placenta prævia, as recommended by Prof. Simpson, probably the head may be kept so compressed against the os uteri as to prevent fatal hemorrhage, and possibly sometimes deliver so speedily as to save the child.

In cases of prolapsus of the funis umbilicalis, the fold may be completely returned by placing it between the ends of the fingers of the Extractor, when it will rest upon the bunch of silk band, as prepared for introduction, by which it can be carried entirely above the head and held there until the head is delivered.

The difficulty of describing an instrument that is entirely unique may prevent me from making myself understood without exhibiting it; but I think no one will fail to see its plausibility, upon an examination of the Extractor itself.

That it will fill most of the indications pointed out, I have no doubt; but extensive experience must be the test of the range of its usefulness.

CHICAGO, *May*, 1850.