

EXTRACTOR INSTEAD OF FORCEPS

DR. VIKTOR FINDERLE, RIJEKA (FIUME), YUGOSLAVIA

(From the Departments of Obstetrics and Gynecology of the General Hospital, Rijeka [Fiume], Yugoslavia)

IT IS frequently necessary to consider means of shortening the second stage of labor in order to reduce the danger for the mother and for the child. For this purpose the obstetrical forceps are today used all over the world.

The principles of their use have been gradually developed over many years. Paul Portal, as early as 1685, expressed the opinion that the dilatation of the cervix should be left to natural processes. Later, Denman proposed that labor should be ended with the use of forceps whenever the second stage had lasted six hours and all other means of delivery had been tried. His pupil, Merriman (1810), however, extracted the child, whenever his life was threatened in the second stage of labor, after waiting two hours. Williams was also of the opinion that forceps should be used when the second stage lasted over two hours. More generally accepted today, however, is the rule (Siebold) that there is no time limit for the second stage, but that the endangered child or the mother may require the use of the forceps at any time.

Many users have tried to change the original shape of the forceps or in some way to improve the instrument. Hugh Chamberlain was among the first to employ such an instrument and claimed to know a safe way to end the delivery without danger for mother or child. Up to the present, the original shape of the forceps has been changed about two hundred times.

William Hunter (1718-1783) tells us that sometimes this instrument can be very dangerous and that it "brought the world more accidents than happiness." Georg Winter says that an enormous number of mothers and children were victims of the everyday use of the forceps and he calls it "a most dangerous instrument."

The fetal mortality from the use of forceps varies widely with the indications for which it is employed. Some authors, evidently referring to mid or high forceps, have reported figures as high as 12.4 per cent, whereas others have indicated a fetal death rate as low as 1 per cent. To the mortality must be added a variable morbidity, including injuries to bones, nerves, or skin as well as intracranial bleeding, which may show their consequences later in life.

Because of the great danger, the use of high forceps is today avoided. When necessary the child has been delivered by other means, even with the use of strings (Pierre Amand, André Levret) or, as has been tried in Japan, by means of a device employing sticks and silk ribbons (Seisu).

James Simpson (1851) also experimented with a special device for application to the child's head. In New York MacCahey tried to use his "air-tractor"

in emergency cases, but, lacking the knowledge of asepsis and anesthesia and as a result of some unexpected complications, nothing was accomplished from the use of such instruments.

Extractor

The "extractor" to be described in this article is a bell- or horn-shaped instrument the wider end of which is covered with rubber (Fig. 1). This end is inserted in the vagina and applied to the child's head. The other end is attached to a rubber tube, which permits the exhaustion of the air from the extractor by means of a syringe. When the necessary vacuum is achieved the tube may be closed by a stopcock. When applied in such a way to the child's head the extractor can be held firmly by the handles and pulled as desired, or a weight of about six pounds can be hung to it so that traction may be evenly and gradually applied until the child is delivered.

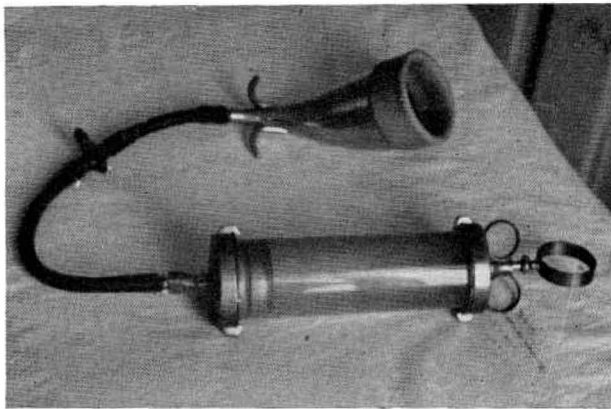


Fig. 1.—Extraction with a 200 c.c. syringe.

The instrument is very easy to insert in the multipara but in the primipara a small episiotomy under local anesthesia is advisable. The advantages of the extractor are many because it is a round-shaped instrument which can do harm neither to the mother's organs nor to whatever part of the child's body to which it is applied (Figs. 2 and 3).

Maternal Indications

The maternal indications for the use of the extractor during delivery in the second stage of labor are as follows: (1) weak labor pains and/or weak bearing down efforts; (2) moderate disproportion between the child and the soft parts of the genital tract, which may be easily overcome; (3) impending rupture of the uterus when there is no disproportion or obstacle to overcome during delivery from below; (4) premature separation of the placenta; (5) fever during delivery, of genital origin; (6) eclampsia and other types of severe toxemia; (7) general illness, such as diseases of heart, lungs, or kidneys, and other states which could be improved by delivery.

Fetal Indications

There is always an indication for the use of the extractor in childbirth when fetal life is in danger, as indicated by a fetal heartbeat of less than 100 per minute even though this increases in the intervals between labor pains,

or by a fast heart rate of above 160 a minute which does not decrease in the intervals between labor pains. There is danger also when the child's heart is beating irregularly or arrhythmically.

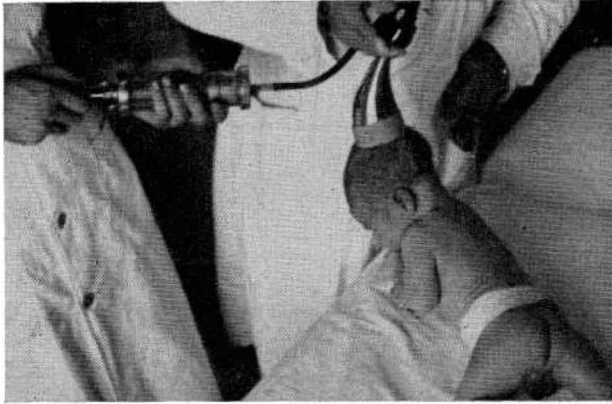


Fig. 2.—Extractor applied to child's head after delivery.



Fig. 3.—Suction power of extractor is demonstrated by lifting a child after delivery.

Contraindications

Indications not to use the extractor are always present when it increases the danger for the mother or for the child: (1) cephalopelvic disproportion as a result of a large child or small pelvis; hydrocephalus and tumors of the child's head; abnormal position of the head, preventing the passage of the child through the genital canal; (2) tumors of the uterus, ovary, and other organs which are in the way and are obstructing the passage of the child's body; (3) abnormal position of the child, such as transverse presentation; (4) contraction of the birth canal which does not allow the correct application of the extractor; (5) unruptured membranes which should be perforated before the use of the extractor.

When the child is dead, the extractor is used only for sentimental reasons to avoid delivering the child piecemeal.

Preparations for the Use of the Extractor

The patient is prepared in the usual way. The bladder and intestines are emptied, the hair is shaved, and the exterior of the genitals disinfected.

The special sterilized instruments that must be available include the extractor, a syringe of 200 to 300 c.c. capacity, and sutures in case of episiotomy. The patient's position is as during a normal delivery.

First, we must know the exact position of the child in relation to the genital canal. Anesthesia is not necessary except in special cases. Often we do give light anesthesia and we use a local anesthetic if episiotomy is necessary.

The extractor is inserted gently until the wider end rests on the child's head or any part of the body which presents. Now with a syringe we take the air from the instrument pumping it two or three times. When the desired vacuum is obtained we close the horn-shaped instrument with a little stopcock situated on the rubber tube. By palpation we can determine if the rubber-padded end rests properly on the child's head or body.

Now, simply by pulling by hand or by means of a weight of 3 kg. (about 6 pounds) we extract the child.

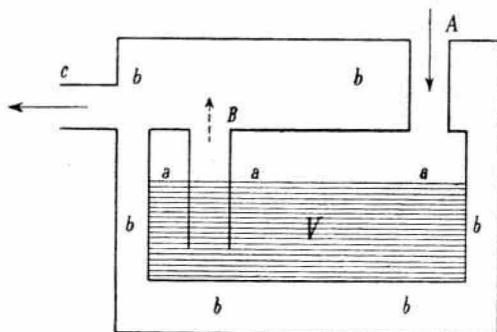


Fig. 4.—Explanation of extractor's action by a modification of Sellheim's drawing.

Extracting the Child With the Extractor

According to Sellheim's concept, a child is forced out during delivery by physiological forces, the contractions of the uterus and the pressure of the abdominal muscles. These forces are effective from above. Using the extractor, we add to the contraction power from above additional power on the opposite side from below.

We can compare this procedure with a hydraulic experiment explained in Fig. 4. The water can be forced out of the vessel in two ways, either by pressure on the upper surface or by suction from the bottom from under the water's surface. The result is the same whether we put pressure on the opening *A* or extract the air through the pipe *C*. In both cases the water comes out on the opening *B*.

We can compare the pressure through *A* to the labor contractions, and the extracting of the air through *C* as the pulling of the extractor.

Advantages of the Extractor Instead of Forceps

The advantages of the extractor over the conventional forceps may be listed as follows:

1. The extractor is a light, round-shaped instrument so it cannot injure the child or the mother's organs. It is not inserted deep into the genital tract and does not go over the child's head, so no harm can result to the mother's

genitals. Although parts of the child's body where the extractor is applied sometimes show a slight mark, this disappears shortly after delivery something like a *caput succedaneum artificiale*. Since the child's head is not pressed, there is no danger therefore to inner cranial parts.

2. The insertion is very simple and the extractor can for that reason be used by doctors who are not experts. It is possible to apply the extractor to any part of the child's body which is suitable to hold the vacuum and which is nearest to the exit.

3. During extraction the child can be turned in every way without danger. It is possible for the extraction to be made quickly by hand or slowly and evenly with the use of weights.

4. The extractor is lightly constructed, easy to carry, easy to prepare, and easy to clean.

Results

In the Obstetrical and Gynecological Department of the General Hospital at Rijeka there are delivered annually from 1,350 to 1,600 children. The incidence of cesarean section is a little over 2 per cent.

During the last three years, or since October, 1950, the use of forceps has been completely discontinued. The extractor has been used in 132 cases, 103 of these being deliveries of primiparas.

The weights of the children so delivered were as follows: less than 2,500 grams, 5; 2,500 to 4,000 grams, 109; over 4,000 grams, 21. The fetal indications included threatened asphyxia in 83 cases; large baby, 9 cases; prolapse of the cord, 1 case; prolapse of a hand, 2 cases. The maternal indications included uterine inertia, 91 cases; slightly contracted pelvis, 8 cases; eclampsia, 1 case; and myoma of the uterus, 1 case.

There were 3 instances of twins. The vertex was presenting in all but 5 cases, there being 1 brow and 4 breech presentations. Twice the extractor was used upon an already dead child.

There were no deaths or complications attributable to the extractor.

We can conclude that the extractor is in every way much simpler and easier to handle than forceps and is perfectly safe for mother and child.

Summary

The extractor is an instrument shaped like a horn or like a bell which can be used in the second stage of labor to extract the child. This instrument is far less dangerous than forceps and much easier to handle. Instead of requiring deep insertion over the child's head or any part of his body, the extractor is simply applied to the part of the body nearest the operator. After applying the extractor and making a vacuum in the instrument, the extraction of the child becomes easy. It can be done quickly by hand or slowly and evenly with the help of traction and a weight of about 6 pounds.

In our department the extractor has been used successfully in 132 cases. There were no complications or accidents to mothers or delivered children.

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