

# ASSISTED VAGINAL DELIVERY

O B S T E T R I C   F O R C E P S  
AND VACUUM EXTRACTION TECHNIQUES

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Obstetric Forceps and  
Vacuum Extraction Techniques

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# Preface

Twenty-three years ago the senior author published *Obstetric Forceps*. In evaluating material to prepare for the current volume, the preface to that work was reviewed and found still to be pertinent and meaningful. For that reason, we are repeating it here.

This book is intended for both the resident in obstetrics and gynecology and the practicing obstetrician. It is my hope that it will serve as a handbook on the use of obstetric forceps.

The volume of knowledge related to our specialty increases at an explosive rate—in our affluent society, it is fashionable to pursue what is new. A significant sign of the times is our tendency to forget that the purpose of graduate training is to produce competent clinicians whose prime concern must be the care of patients. As physicians, they must not merely function, but function well, in both the delivery and operating rooms. Graduate training programs, therefore, should emphasize the clinical fundamentals of the specialty.

Since the forces of labor, application of forceps, and delivery of the infant are such dynamic subjects, every teaching aid must be employed if the student is to fully comprehend them. The classroom lecture and the use of the manikin can provide the students with theoretic knowledge, but the ultimate learning experience is the demonstration and use of the forceps in the delivery room. The final goal of forceps instruction cannot be taught by implication, but must be achieved by the student himself.

One of the essentials in teaching the use of obstetric forceps is to instill a respect for the various instruments and the values, indications, and limitations of each. They are not “hooks” or “claws,” but surgical instruments. They are not for “spinning” or “dragging,” but assist in rotation and extraction. Proportionately larger than most surgical instruments, they are involved with a most sensitive object. Their use must be approached with the

same temerity as is any surgical procedure and with an adherence to sound surgical principles.

Proper instruction regarding obstetric forceps must be predicated on a sound knowledge of the forces of labor, the anatomy of the female pelvis, and the positions the fetus can assume. When these are appreciated, the factors which contribute or predispose to a particular problem are understood. Only then can a proper instrument be selected for use. Just as we try to cultivate surgical judgment in our training programs, we should encourage "forceps" judgment.

Familiarity, in this instance, fosters respect. If the student is to properly use an instrument, he must be comfortable with it. Aware of the origin, construction, and functions of the forceps, he then can appreciate the forces involved. As new or modified instruments appear, he will be in a position to consider and evaluate them.

There is no doubt that, since the publication of the first edition, there have been multiple reevaluations of the clinical use of obstetric forceps. Many factors have contributed to this ongoing reassessment. Unfortunately, the teaching of the clinical use of obstetric forceps has significantly diminished in this country, and very little is taught in current training programs about their proper use. No doubt the vulnerability of obstetricians to litigation has had a significant influence on the employment of these instruments. Today, it is much easier to perform a cesarean section with the hope of avoiding malpractice lawsuits; for this reason, the incidence of cesarean section in this country has risen astronomically. We are amazed that so little is stated in the current literature on the use of obstetric forceps and that improved instruments are frequently not available in many obstetric departments. For the past five years, there has been a resurgence of interest in the use of obstetric forceps. Major new contributions to the literature have questioned many of the previous decisions. It is evident that there is a need for carefully conducted comparative studies, that have thus far never been performed, to better assess the proper use and place of midforceps operations in current practice.

In this volume, we have included the history, development, and clinical use of vacuum extraction. During the past 15 years, the Silastic vacuum extractor has become popular and, in some instances, has nearly replaced the use of forceps in this country. By including this discussion on the soft cup, we hope to provide readers with a more comprehensive understanding of the indications and use of all currently employed obstetric instruments for assisted vaginal delivery.

The authors hope that this handbook on the proper use of obstetric

instruments will be a valuable adjunct, not only to medical students but also (and perhaps primarily) to residents who are in clinical training, as well as to junior faculty who have not had proper instruction in how these instruments should be used properly.

We wish to express our appreciation to Nat Russo, who encouraged us to undertake this new edition. We are indebted to Gretta Small for the careful editing of the text; to Nancy Face for her meticulous artwork; and to Dorothy Vanderwall, who faithfully typed and retyped the manuscript.

Most of all, we are indebted to Sy Laufe, who served as preliminary editor and scribe; who provided support, nourishment, and sustenance, both psychological and physical; and without whom this edition would never have become a reality.

# ASSISTED VAGINAL DELIVERY

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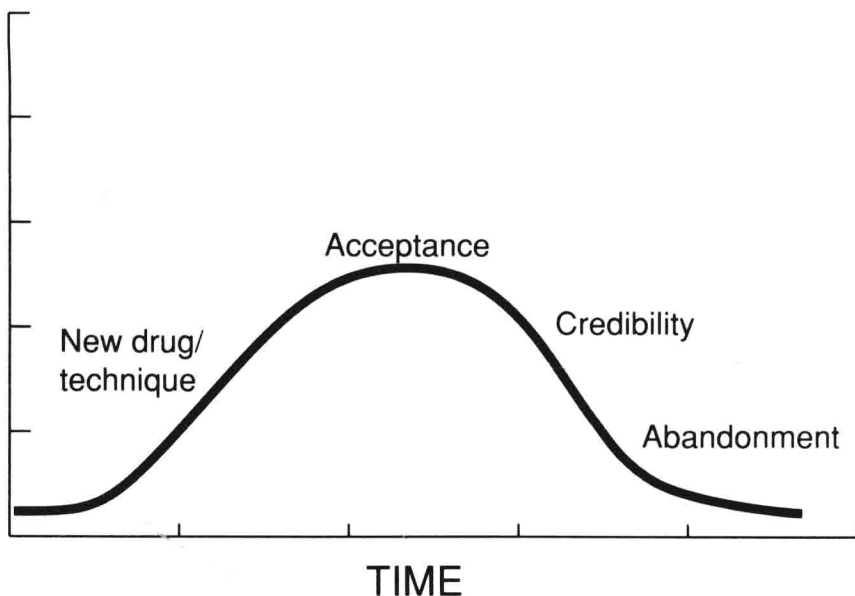
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## Dilemmas in Obstetric Practice

Throughout medicine, the volume of knowledge has expanded enormously in the past 25 years. The improvement in techniques and in the understanding of problems has reached levels that were undreamed of a quarter century ago. As an example, thinking back, we could hardly have envisioned organ transplantation such as is now occurring on a daily basis.

The same explosion of knowledge has occurred in obstetrics and gynecology. The improved understanding of reproduction, oncology, and genitourinary function, as well as the additional knowledge of prematurity and medical complications in pregnancy, is almost overwhelming.

We are certain that many can recall that, 20 to 25 years ago, evaluation of new drugs or techniques was largely limited to simple efficacy studies. These basic studies, many of which were sponsored by pharmaceutical companies, can be viewed as an almost bell-shaped phenomenon (Fig. 1-1). Each time a new drug or technique was advocated, there was a period of rapid acceptance throughout the field and, for the next few years, the technique or drug seemed to be embraced by the majority of physicians. As experience with the drug or technique accrued, however, a credibility gap began to appear and, within a few years, the enthusiasm with which it had originally been embraced rapidly diminished and the technique or drug fell into disuse.



**Figure 1-1** Typical response to new drugs or techniques prior to controlled studies.

As the field of epidemiology grew and biostatistical techniques were applied to problems, a better method of evaluating procedures and drugs developed. Today, one would not consider a study appropriate unless it had been subjected to biostatistical methods and the procedure or drug studied under a double-blind technique. Assisted vaginal delivery has only barely made it into this realm of modern evaluation.

This detailed scrutiny has revealed a considerable number of dilemmas in the field of clinical obstetric practice. Numerous examples can be cited:

- The delivery of medical services to many rural areas and smaller hospitals remains unequal.
- Although empirically demonstrated by many university studies, the safety of vaginal birth after cesarean section is still not a commonly accepted practice in most community institutions. As a result, repeat cesarean section remains one of the major contributing factors to the increased number of surgical deliveries.
- The management of breech presentation has become subject to a great divergence of opinion. There are those who emphasize that a breech should always be delivered by cesarean section, yet there are others who have carefully outlined which

breeches can be handled from below and have restricted their sections to those with significantly increased risk.

- Many clinicians use tocolytics on all patients who threaten to undergo premature labor, whereas others believe they are ineffective.
- Today, nearly all mothers are monitored electronically during labor; however, a series of studies has questioned the utility of such monitoring in normal patients and indicates that it may lead to a higher incidence of cesarean section.

The clinician today is faced with many other dilemmas in managing patients:

- There are major discussions on whether home monitoring of a fetus should be employed and how it should best be done.
- Management of the second stage of labor is a controversial problem confronting most clinicians.
- Some physicians have liberalized the use of cesarean section for the second twin, with the hope of obtaining better results and reducing infant morbidity.
- The delivery of extremely low-birthweight infants has also produced a fair amount of controversy. Some say that these babies should always be delivered by cesarean section; others emphasize the increased morbidity and neurologic defects that can occur in the very premature.
- Every major institution in this country that provides obstetric service is faced with the problem of the drug-addicted mother and the effects on the newborn. This problem has still not been resolved in institutions that provide medical care for these mothers and infants.
- One of the major issues that has confronted medicine is the explosion of AIDS and how best to manage and treat these patients. What is the appropriate counseling for such a mother? Should she terminate the pregnancy, since there may be a 30–35% risk to her infant?
- The highly acclaimed fertility drugs that have proven to be such a boon to many couples have brought with them the problem of multiple gestations. Is fetal reduction indicated to reduce the risk of premature delivery in these cases?

It is almost impossible to pick up a journal without finding a discussion of one of these issues.

One of the major dilemmas that has faced obstetric practice is the use of obstetric forceps. The past 20 years have seen a significant reduction in their clinical use; the teaching and demonstration of the

proper technique of their application has been almost completely eliminated. A major reason for this is the liability that has come to be associated with instrumental delivery. Today, parents expect a perfect outcome, and any deviation from perfection can lead to litigation. If forceps or vacuum extraction is used for a delivery, that provides a focus for parental disappointment and a target for legal action, regardless of the cause of a poor outcome.

The runaway rate of cesarean section has brought a much needed reappraisal of this trend and, as a result, the last five years have seen a significant resurgence of interest in assisted vaginal delivery. Today, many institutions are once again actively teaching the use of obstetric forceps. Although there are programs that minimize the use of forceps and advocate vacuum extraction, there is a paucity of proper comparative studies on the value of these instruments. We are certain that there is a place for both in the field of clinical obstetrics; however, unless our students, residents, and junior faculty are properly instructed in both modalities, it is difficult for them to make a proper choice. Experience breeds familiarity, and if assisted vaginal delivery is to find its proper place in clinical practice, it is mandatory that residents and junior faculty be properly informed about these instruments.

### SUGGESTED READINGS

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## The Evolution of Obstetric Forceps and the Vacuum Extractor

### THE ANCIENTS

The obstetric forceps has a heritage that is one of the richest in the history of medicine. Basically a simple tool compared to many inventions, its history is shrouded in secrecy. It probably has saved more lives than any instrument ever devised, but it did not appear until countless generations either struggled into the world without it or failed to arrive. A solid thing, easily fabricated, it is yet capable of such subtle variation that its evolution has never stopped. It is designed specifically to ensure the safe delivery of an infant without damage to the mother, and yet it is descended from an instrument of death.

The ancients had various instruments to which they resorted when normal delivery was impossible, but by their very nature, these instruments were not capable of bringing forth a live child. They were tools of mutilation and destruction, and were used in an attempt to save only the life of the mother.

There are a variety of passages in the early medical literature describing attempts to resolve the problems of obstructed labor. The ancient Japanese attempted to extract a fetus with fillets of whalebone placed over the fetal head. Hindu writing, long before Christ, referred to a knife and a hook for perforation of the head and extraction of the fetus. Hippocrates wrote about the problem of difficult labor in 400

B.C., but the only instruments referred to were those for the mutilation and extraction of a child already dead.

Soranus, the eminent Greek physician of the early second century A.D., wrote in his textbook of gynecology that the role of the midwife was as follows:

Now she must insert the fingers gently at the time of dilatation and pull the fetus forward, giving way when the uterus draws itself together, but pulling lightly when it dilates. When human hands fail to deliver the infant safely, if the fetus does not respond to manual traction, because of its size, or death, or impaction in any manner whatsoever, one must proceed to the more forceful methods, those of extraction by hooks and embryotomy. She continues that even if one loses the infant; it is still necessary to take care of the mother.

There, briefly stated, is the concept of midwifery from the time of the ancients until the seventeenth century and the Chamberlens.

Only one man in early times, a celebrated Arabian physician, Avicenna, approached the concept of a saving forceps. Drawings of the obstetric forceps of that time by his contemporary, Albucasis, about 1000 A.D., showed a number of implements with murderous teeth (Fig. 2-1). None of these instruments could have delivered a living child, unless it was terribly mutilated, but there is one passage in the writings of Avicenna that leaves open the possibility, however remote, that another kind of obstetric forceps may have existed.

Avicenna wrote that if manual traction were not successful, it should be followed by use of the fillet, a net of cloth band worked over the head of the fetus by which the infant might be forcibly withdrawn. If the fillet were unsuccessful, he concluded, then "let the forceps be applied, and let it be delivered by them." Avicenna added that, should the forceps be unsuccessful, the infant must be withdrawn by incision, "as in the case of a dead fetus." This sequence in his writings implies that the forceps, coming as it does before the last alternative, might be used to deliver a child alive.

It is a slim possibility that has supported much speculation throughout the ages. If Avicenna did possess a conservative forceps, the instrument has been lost to knowledge, and his provocative phrasing remains to suggest that it might once have existed.

Historical speculation supports only one other figure before the Chamberlens as the possible inventor of a conservative forceps. Jacob Rueff, who was the city physician of Zurich, described in his *Midwifery* of 1554 a smooth-bladed instrument that was conservative, at least in appearance. It was a locked pincers, crossed at the shanks, with cup-