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### Intrapartum management of the large infant

Diane J. Angelini R.N., C.N.M., M.N. <sup>a</sup>

<sup>a</sup> Women's Hospital, Los Angeles  
County-University of Southern California,  
Medical Center, Los Angeles

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# INTRAPARTUM MANAGEMENT OF THE LARGE INFANT

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Diane J. Angelini, R.N., C.N.M., M.N.

Women's Hospital, Los Angeles County-University of Southern California  
Medical Center, Los Angeles

Preparedness and recognition of suspected complications may prevent or minimize the morbidity often encountered in the labor and delivery of an oversized infant. Risk factors during labor are examined, and effective management at delivery is discussed. Careful attention is given to both maternal and fetal considerations during the birth of a large infant.

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One of the most dramatic events in any delivery area is the often difficult and traumatic birth of a macrosomic infant and its sequelae. For any woman, delivering in or outside a hospital setting, the presentation of a large infant may forecast problems. Anticipation of and preparedness for possible complications may prevent or minimize morbidity.

## DEFINITION OF A MACROSOMIC INFANT

By definition, a macrosomic infant is one greater than the 90th percentile by weight.<sup>1</sup> Some describe such an infant as large for gestational age. Several factors, alone or in combination, may account for such macrosomia: (1) large size of one or both parents, (2) multiparity, (3) diabetes in the mother, and (4) some instances of postmaturity.<sup>2</sup> Certain racial groups, such as some Indian tribes, have large babies. It is common practice to designate all newborn infants weighing 4000 g or greater as "excessive sized."<sup>2</sup>

## RISK ASSESSMENT

The question arises, Are all large-for-gestational-age infants at risk? It is known that many large infants do well and that their delivery results in minimal birth trauma to mother or infant; yet many factors need to be considered and anticipated before ruling out potential problems. Some believe that because oversized infants are more often

born to multiparous mothers and to women with diabetes, both the maternal and fetal risks are increased in such cases. In a comprehensive study done by Sack,<sup>3</sup> problems resulting from the birth of a large infant at a county hospital were reviewed during the years 1947-1956. Of 84,017 deliveries during this period, 0.92 percent were infants weighing 10 lb or more. The major complications surrounding birth of these infants were postpartum hemorrhage (10.3 percent), shoulder dystocia (10 percent), clinical diabetes (2.9 percent), toxemia (14 percent), and perinatal mortality (7.2 percent, which is 7 times the hospital incidence for term infants). Of these large infants, 16 percent were depressed at birth; and 11.4 percent of the 200 infant survivors had neurological complications upon follow-up.

## RISK CONSIDERATIONS DURING LABOR

Anticipation of a large infant begins before the time of labor. Careful appraisal before childbirth of estimated fetal weight and fundal growth, as well as ultrasonic measurement of biparietal diameter and screening for diabetic risk, may assist the care giver who suspects a large infant before the time of labor. When caring for *any* woman in latent or active labor phases, however, a careful examination of the following parameters should be performed.

### Size-Dates History

Accurately establishing the time of the last menstrual period and that of the one previous to it is helpful in establishing precise gestational age. An early pregnancy test, documented number of weeks of fetal heart tones, and the date when fetal heart tones were first heard with fetoscope versus doptone are all additional indexes of gestational age. An early b-scan documenting size-dates consistency or inconsistency may later help diagnose the postterm or potentially postmature infant. Good dates are most important in relation to infant size as appropriate for gestational age, large for gestational age, or small for gestational age. A prolonged gestation should be carefully documented because the combination of a large, postmature infant with the meconium-stained amniotic fluid presents even greater risk at time of delivery.

### Estimated Fetal Weight

An accurate estimation of fetal weight at time of labor aids in forecasting potential problems. Weight of 4000 g or more may

result in difficulty because of cephalopelvic disproportion or contribute to an arrest in labor progress, to shoulder dystocia, or to postpartum hemorrhage.

### **Fetal Head Size**

The size of the fetal head during vaginal examination may alert the examiner that an infant may be large. More accurately, the examiner should establish how the fetal head fits into the pelvis, how much space is taken up, and how tight the fetal head feels against the pelvis. A careful clinical pelvimetry is mandatory when a large fetal head or infant is expected, especially when labor fails to progress. Congenital anomalies and aberrations should be considered when making these assessments.

### **Past Obstetrical History**

Any patient with a past history of large babies, a traumatic birth, certain congenital anomalies, or excessive bleeding at delivery may warrant taking a more detailed history including infant birth weights. Given such a past history, a diabetic screening would appear appropriate. When patients have had no prenatal care, it is equally imperative to obtain an accurate past obstetrical history at the time of labor as well as some indication of the status of this pregnancy to establish the potential for an infant large at birth.

### **Diabetic Screening**

Data from prior diabetic screening may assist in documenting gestational diabetes for the following patients characterized by obesity, increased maternal age, history of macrosomic infants, poor obstetrical history, family history of diabetes, congenital anomalies, preeclampsia or hypertensive history, birth trauma, or glycosuria. Documentation of diabetes during pregnancy can assist in explaining clinical evidence of a large infant at delivery. An early delivery may be planned for patients with varying degrees of clinical diabetes during pregnancy.

### **Parity**

Sack noted that parity distribution revealed that multiparous mothers have a higher incidence of large infants than do primiparous mothers.<sup>3</sup> Sack further noted that the birth of a large infant should

be *expected* with both mothers who have previously been delivered of a large infant and older multiparous mothers.<sup>3</sup>

### Perineal Body

In anticipation of a large baby at birth or of potential birth trauma, observation of the size of the perineal body, especially when it is short, is helpful when contemplating a possible episiotomy. Vulvar varices; old, unrepaired lacerations; and excessive condylomata acuminata may also present problems with the birth of a large infant or when birth trauma results from a difficult delivery.

### Labor Pattern

Accurate documentation of the type of active labor pattern, as well as progression during labor, can provide evidence of cephalopelvic disproportion or failure of labor progression even with sufficient contractions. A large infant, as well as other factors, may be responsible for such outcomes. The length of second-stage labor, especially with multiparous mothers, can be significant. Of the 62 patients with a second-stage labor longer than 1 hour in Sack's study, the perinatal mortality or morbidity increased; and in 22 of the cases, shoulder dystocia existed.<sup>3</sup>

Careful notation of fetal position, of progress in station of the presenting part, and of fatigue factors inherent in long labors can all aid in reassessing potential fetal size. All these factors may indicate the need for operative obstetrics, that is, use of forceps, vacuum, or cesarean section, or they may signal a potential failure with forceps that warrants cesarean section. At Parkland Memorial Hospital, 16.9 percent of patients with infants weighing 4000 g or more at birth were sectioned for "large infants."<sup>2</sup> With infants weighing 4500 g or more the cesarean section rate was 25 percent.<sup>2</sup>

### Fundal Height

Fundal height measurement at time of labor that is greater than 40 cm should alert the examiner to a large infant, multiple gestation, or other complications. A real-time or beta scan can help in evaluating the situation more accurately and in differentiating a large infant from multiple gestation, fetal anomalies, or other problems.

## Abdominal Palpation

Worthwhile time is spent in performing an accurate Leopold's maneuver at time of labor. Excessive fetal parts, helpful in documenting twins, and a general outline of the fetus can be ascertained. More specifically, careful abdominal palpation will force the examiner to do more than briefly scan the abdomen and note fetal size.

## Position of Presenting Part

Persistent occiput transverse or occiput posterior presentation may forecast potential difficulty in the mechanism of labor. An oversized infant may find it difficult to negotiate the pelvis and thereby rotate less easily for birthing. This is, however, dependent on pelvic diameters as well as on other indexes.

## MATERNAL AND FETAL RISKS AT DELIVERY

### Shoulder Dystocia

In one study, the incidence of shoulder dystocia in oversized infants weighing more than 4000 g was 1.6 percent.<sup>4</sup> Shoulder dystocia occurred in 10 percent of the cases in Sack's study (birth weight of 10 lb or greater) during 1947-1956.<sup>3</sup> True shoulder dystocia versus difficult shoulder delivery only, should be carefully documented.

The following actions should be taken when the potential for shoulder dystocia exists:

1. Catheterize patient before delivery.
2. Have pediatric backup easily available.
3. Consider an episiotomy.
4. Note well at delivery the size of the fetal head and any failure to restitute or rotate externally.

In addition, delivery may be aided by:

Placing shoulders into oblique diameter

Using suprapubic pressure

Additional intra-abdominal pressure

Extension of episiotomy

Using exaggerated lithotomy position

Using Wood's screw maneuver or delivery of posterior arm and shoulder first

With large infants, dystocia may arise because the head becomes not only larger but harder and less malleable with increasing weight. It can also be helpful to time how long the head has remained on the perineum. Reducing the time from delivery of the head to delivery of the body is of importance to survival. Careful examination of the infant for trauma-related injuries is advisable after birth.

In an imminent delivery, it behooves the examiner to scan the abdomen quickly to evaluate the potential for dystocia to occur. Being unprepared can make the circumstances less than optimal. Nelson and Gabbe note that an experienced practitioner should also consider the presence of a fetal tumor (i.e., massive hemangioma or lymphangioma) when the usual maneuvers fail to relieve should dystocia.<sup>5</sup>

### Postpartum Hemorrhage

A woman may become fatigued if she has had a prolonged labor or has been on a prolonged regimen of oxytocin augmentation. Add to this an oversized infant, and the potential for postpartum hemorrhage is increased. If the patient has also been receiving magnesium sulfate, careful consideration of the possibility of postpartum hemorrhage becomes necessary. Use of oxytocin, Methergine, and bimanual compression may aid in bringing a severe hemorrhage under control. Evaluation of vital signs and accurate estimation of blood loss are needed. Taking postdelivery serial hematocrit values and careful monitoring of vital signs after a blood loss of greater than or equal to 500–700 cc are necessary to evaluate whether or not postdelivery transfusion is warranted.

### Infant Problems

Potential for infant morbidity, as well as mortality, exists whenever a shoulder dystocia occurs. For example, fractured clavicles and brachial plexus palsy can occur. Traumatic neuropathy of the brachial plexus is one of the more common birth injuries and is the result of traction on and lateral flexion of the neck in delivering the shoulders.

Birth fractures almost always involve the clavicle, humerus, or femur.<sup>1</sup> The fractures may be painless, and only an unrelated X ray may chance to reveal them. In other cases the fracture may be painful and cause the affected limb to be immovable when stimulated. Absence of motion in the affected extremity can be a clue to a birth injury. Supraclavicular swelling and clavicle fracture, documented by X ray, and plexus injury can occur. Follow-up of such birth-related



injuries requires passive range-of-motion exercises and eventual active exercises for months or years afterward. Around 3–5 years of age, certain types of residual damage may be surgically corrected.

In many institutions, an infant born weighing more than or equal to 4000 g has a dextrostix performed soon after delivery because of the close correlation between oversized infants and maternal diabetes.<sup>2</sup> Hence, hypoglycemia and hypocalcemia may exist in large-sized infants of diabetic mothers, screened or un-screened, before delivery.

Severe depression at birth of oversized infants can necessitate such resuscitative procedures as:

Pediatric backup or backup by someone qualified in resuscitation of severely depressed newborn

Use of resuscitative equipment

Careful recognition of birth-related injuries, jitteriness, nerve damage, and meconium aspiration

When infant morbidity or mortality exists, careful explanation to the parents at the time of birth helps in dealing openly with the outcomes of birth-related injuries.

### **Birth Trauma to the Mother**

Extensive lacerations, extension of episiotomy, or vaginal sulcus tears may ensue during delivery of an oversized infant whether or not forceps have been used. Tissue trauma of this sort to the mother results in tissue swelling, labial edema, difficulty in voiding, and moderate-to-severe perineal discomfort. The risk of postpartum infection may also increase.

For any woman in second-stage labor who has been pushing for an extended time, frustration ensues. The additional psychological trauma experienced by the woman or couple following a prolonged or difficult birth of a large infant may take days or weeks to resolve. Both the woman and her supportive others may have a need to talk over the birth or set straight the events that took place. Attention to such issues as (1) body-image distortion; (2) body-integrity changes; and (3) comfort measures, such as body positioning, sitz baths, and ice to the perineum, is paramount.

### **IMMEDIATE RECOVERY PERIOD**

Careful monitoring of (1) vital signs, (2) uterine firmness, (3) lochial flow, and (4) tissue healing is necessary after delivery. Follow-

up hematocrit levels may or may not need to be taken. Events surrounding the birth process need to be carefully recorded. The infant should be followed up for such problems as hypoglycemia and brachial plexus palsy.

A program to improve on the results of birth where there is a large infant established that

1. An intravenous infusion should be started before delivery in all suspected cases.
2. Blood should be immediately available in all cases where the antepartum index for large infants is high.
3. Medical staff should be alerted to the potential problem.
4. Shoulder dystocia management should be reviewed.
5. Newborn service should be made aware of the gravity of potential problems with large infants.<sup>3</sup>

This list of suggestions, along with others, was implemented by Sack following his 1947-1956 review. In 1966, he again looked at a series of large infants at the same institution. The perinatal mortality was decreased by half.<sup>3</sup>

The need for preparedness, emotional and otherwise, is truly brought home when one enters the birthing area and is faced with immediate problems. For the parents and for the professionals involved, the trauma of the birth experience may take days or weeks to work through. Peer and professional support during and after the delivery help ease the emotional exhaustion. Preparedness, recognition, and effective management are appropriate responses in handling the large infant during the intrapartum period.

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