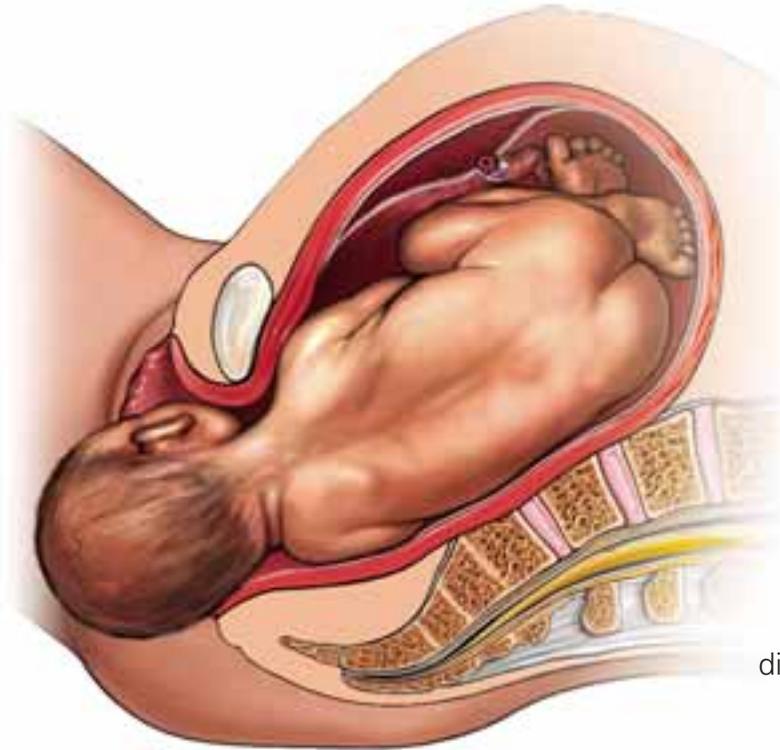


Delivery dilemmas: shoulder dystocia



It's obstetric challenges such as these that test our skills in the delivery room—and expose us to greatest medicolegal risk. Here, the authors detail predelivery warning signs and specific intrapartum maneuvers that can help obstetricians rise to the challenge of this difficult delivery.

Shoulder dystocia is an obstetric emergency requiring skillful intervention from all delivery personnel. The good news is there are several techniques clinicians can utilize when this condition arises—and even ways to spot it prior to delivery. A thorough knowledge of these approaches, coupled with expert support from a staff of skillful, proficient assistants, can help reduce the frequency and severity of this challenging disorder.

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KEY POINTS

- The most frequently described occurrence prior to a shoulder dystocia emergency is the “turtle” sign during contractions, in which the vertex is seen at the introitus, but subsequently recedes after maternal expulsive efforts.
- Upon encountering a shoulder dystocia, immediately announce the condition, summon help, and alert the anesthesia department. The mother’s pelvic capacity and the estimated fetal weight help determine just how difficult resolving shoulder dystocia may be.
- Physicians should concentrate gentle, downward applied force at the shoulder girdle—either to rotate it or dislodge it directly.
- Do not apply fundal pressure, as it tends to further aggravate shoulder impaction.

TABLE 1

Antepartum signs of possible shoulder dystocia

• Fetal macrosomia (EFW > 4,500 g, nondiabetic gravida; or EFW > 4,000 g, diabetic gravida)
• Fetal habitus (chest diameter-biparietal diameter > 1.4 cm)
• Maternal habitus (maternal prepregnancy weight > 200 lb., stature < 5'3, maternal birthweight > 4,000 g)
• Prior macrosomia (previous infant weighing more than 5,000 g)
• Prior traumatic delivery (previous infant with brachial plexus injury)

EFW=estimated fetal weight

Though not a common obstetric occurrence, shoulder dystocia has the potential to lead to significant fetal morbidity—including nerve plexus injury, clavicle or humerus fracture or dislocation, soft tissue injury to the face, and asphyxia of varying severity¹—and even mortality. Additionally, injuries sustained by the mother in the course of delivery may have lifelong consequences. In an effort to reduce these adverse outcomes, here we describe the risk factors predisposing a patient to shoulder dystocia, review the condition’s mechanism, outline management protocols, and offer our techniques for carrying out a safe delivery.

How it happens

In a normal delivery, once the fetal head is expelled, external rotation—or “restitution”—realigns the head to its proper location in relation to the cervical spine. With the head perpendicular to the shoulder girdle, the shoulders enter the pelvis in an oblique diameter at the inlet. Maternal expulsive efforts cause the anterior shoulder to transit underneath the pubis.

When both rotation and expulsive processes during the pelvic phase of labor fail, however, shoulder dystocia results. While there are differing opinions as to what constitutes true shoulder dystocia,² it is usually

defined as any nonspontaneous birth requiring extensive traction and specific maneuvers to disimpact the infant’s shoulder girdle. Under these conditions, the reported prevalence of shoulder dystocia is 0.15% to 1.7% of all live births.³

Diagnosis of shoulder dystocia is made after the fetal head is delivered and is seen to tightly approximate the maternal perineum.

In general, if the shoulder girdle fails to achieve rotation into the oblique diameters available at the inlet, or if that diameter is inadequate due to fetal size or maternal pelvic shape, completing the delivery process becomes difficult.⁴

Identifying those at risk

There are a number of clues obstetricians may encounter in the antepartum and intrapartum stages of pregnancy that can indicate a potential shoulder dystocia case (TABLE 1). Still, while these associations are helpful, it’s important to evaluate each labor and delivery individually.⁵⁻¹⁰

TABLE 2**Things to keep in mind during delivery**

SIGNS OF SHOULDER DYSTOCIA
• Prolonged second stage
• Minor degrees of malpresentation
• Presence of cranial moulding
• Presence of “turtle” sign during contractions
SHOULDER DYSTOCIA IS NOT CAUSED BY
• Operative delivery, oxytocin, or epidural anesthesia
• The use of delivery instruments
• Nonperformance of episiotomy

Recognizing dystocia

As delivery progresses, clinicians must continually assess the labor curve. Progress of the station during the second stage should be greater than 1 cm/hr. Prolongation of this stage—defined as more than 2 hours in the nulliparous patient and 1 hour in the parous patient, with arrest of descent at station 3 cm or higher—signals possible shoulder dystocia, as does minor degrees of malpresentation, such as occiput transverse, occiput posterior, and the presence of asynclitism (TABLE 2). In addition, the presence of cranial moulding, a sign of potential cephalopelvic disproportion, indicates a potential traumatic birth.

The most frequently described occurrence prior to a shoulder dystocia emergency is the presence of the “turtle” sign during contractions—that is, the vertex is seen at the introitus, but subsequently recedes after maternal expulsive efforts. Diagnosis of shoulder dystocia is made after the fetal head is delivered and is seen to tightly approximate the maternal perineum.

Resolving the problem

The mother’s pelvic capacity and the estimated fetal weight (EFW) help determine just how difficult resolving this condition may

be. An experienced examiner should therefore assess the maternal pelvis for signs of contraction or inadequacy. An ultrasound may be used to estimate fetal weight (these assessments may vary by 6% to 22% in the fetus at term), though manual techniques can be just as reliable. During this time, we recommend talking with the patient about her previous obstetric history. Since many of the pregnancies in question involve parous women, it’s helpful to inquire whether this baby is bigger than her last.

There are several maneuvers the Ob/Gyn can utilize in delivering a child with shoulder dystocia, including the McRobert’s.

Upon encountering a shoulder dystocia, immediately announce the condition, summon help, and alert the anesthesia department. Reassessment of risk factors is then called for. Since shoulder dystocia is a bone-to-bone apposition of the maternal symphysis pubis and the fetal shoulder, with opposing force vectors at right angles, increased traction on the fetal head will only increase the fetal shoulder’s impaction while stretching the

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One sequela of shoulder dystocia: brachial plexus injury

The brachial plexus is formed by the anterior rami of spinal segments C5, C6, C7, C8, and T1. Three cords—lateral, medial, and posterior—are formed as a result of the intermingling of these segmental spinal fibers and make up the peripheral nerves of the upper extremity.

In 1872, Duchenne was the first to associate injury to the brachial plexus due to traumatic delivery of the shoulder girdle. Two years later, Erb further clarified brachial plexus injury as it relates to shoulder girdle impaction, describing localized trauma to the fifth and sixth cervical nerve roots.¹ Erb's palsy—the most common brachial plexus injury—compromises the uppermost trunk, formed from spinal segments C5, C6, and C7. The resulting dysfunction manifests in the posture of the upper arm,

the position of the scapula, and the attitude of the wrist. (Though Phrenic nerve involvement—C4 spinal segment—with resultant paralysis of the diaphragm has been described in conjunction with Erb's palsy, it is very rare.)

Klumpke's palsy, meanwhile, primarily affects the forearm and wrist. It is the direct result of injury to the lower trunk, which is comprised of nerve input from spinal segments C8 and T1. Flexion at the elbow accompanied by supination at the forearm results in the classic claw-like deformity of the hand. If the sympathetic fibers of T1 are affected, Horner's syndrome may result.

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fragile brachial plexus.

Instead, physicians should concentrate applied force at the shoulder girdle—either to rotate it or dislodge it directly. Primarily, this force should be directed straight downward, though transverse pressure may facilitate the shoulder's movement into an oblique diameter of the pelvis.¹¹⁻¹²

Note that if the fetal shoulders are inade-

Do not administer fundal pressure as it tends to aggravate the shoulder impaction by further forcing the fetal shoulder against the maternal symphysis.

quately rotated, normal downward traction may lead to injury, while traction directed along the brachial plexus may result in its stretching or avulsion (see SIDEBAR).

There are several clinical maneuvers the Ob/Gyn can utilize in delivering a child with shoulder dystocia. We've found the following sequence to be efficacious in our practice. As previously noted, this procedure should be well rehearsed and familiar to all labor and delivery personnel.

McRobert's maneuver. Once extra assistants have arrived, perform the McRobert's maneuver by flexing the fetal legs upward toward the mother's abdomen. Then, apply gentle and continuous downward traction to the fetal head. Please note that the *gentle* application of traction will not increase fetal shoulder impaction. If the shoulder girdle remains impacted, cut a generous episiotomy. Now, as the mother pushes, again administer gentle and continuous downward traction to the fetal head. If the shoulder still remains impacted, direct an experienced assistant to apply suprapubic pressure. Note that fundal pressure should not be administered,

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as it tends to aggravate the impaction by further forcing the fetal shoulder against the maternal symphysis.

If further intervention is required, 2 maneuvers are available to decrease the functional length of the shoulder girdle. **Wood's-corkscrew maneuver.** To perform this technique, used in combination with maternal expulsion,¹³ rotate the anterior fetal shoulder toward the fetal sternum to dislodge the shoulder from the maternal symphysis. This should move the anterior shoulder to the posterior position and allow the impacted shoulder to slip under the symphysis. Apply gentle and continuous downward traction to the fetal head in conjunction with maternal pushing to effect delivery.

Direct delivery of the posterior shoulder.¹⁴ This maneuver should not be performed in conjunction with maternal expulsive efforts or uterine contractions. Start by inserting a hand postero-laterally to the pelvic outlet. Then, to gain more room in which the impacted anterior shoulder can be rotated, deliver the posterior arm by sweeping it anteriorly across the chest. This allows the impacted shoulder to drop behind the symphysis, completing fetal expulsion. Note, however, that even when this method is employed properly, the humerus may sustain injury.

Repeat the previously cited maneuvers as necessary. If all of the above strategies fail, more extreme measures may be needed. **Zavenelli maneuver.** Here, the fetal head is pushed back into the vagina and an emergency cesarean section is performed. Combining vaginal and abdominal approaches may effect delivery.¹⁵⁻¹⁶ Unfortunately, at this point, the risk of neonatal morbidity and mortality is dramatically increased.

Symphysiotomy. Another option is the symphysiotomy procedure, in which the ligaments joining the symphysis are severed on their anterior aspect.¹⁷ Releasing these ligaments disrupts the pelvic girdle and increases

its functional diameters so that delivery can be completed. Risks involved in this procedure include urethral trauma and orthopedic compromise postpartum.

Postdelivery procedures

Once the newborn has been delivered, it is important that a pediatrician fully examine the infant in the delivery room, even if no neonatal injury is apparent. In cases of recognized injury, appropriate diagnosis, follow-up, and treatment referral is crucial for both parents and neonate.

Medical records should include a clear and concise discussion of the delivery, personnel present, measures taken, and immediate neonatal result. Always dictate your note to ensure its legibility.

Also be sure that the medical records carefully describe the labor and delivery process. Notation should include a clear and concise discussion of the delivery, personnel present, measures taken, and immediate neonatal result. Always dictate your note to ensure its legibility—never rely on preformatted delivery notes. These documents are invaluable assets in the aftermath of a difficult delivery.

Final thoughts

Difficulty in delivering the shoulders is a relatively frequent obstetrical issue that can present a significant challenge to delivery staff. A thorough understanding of the labor process and techniques employed when this scenario arises can help us best protect both fetus and mother. Ongoing efforts to recognize, avoid, and ameliorate significant injury are a daily challenge to providers of intrapartum obstetric care, especially in the face of challenging deliveries. ■

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