

## PROTOCOL 56

# Shoulder Dystocia

*George A. Macones<sup>1</sup> and Robert B. Gherman<sup>2</sup>*

<sup>1</sup>Division of Maternal Fetal Medicine, Dell Medical School-University of Texas at Austin, Austin, TX, USA

<sup>2</sup>Division of Maternal Fetal Medicine, WellSpan Health System, York, PA, USA

### Overview

All healthcare providers attending vaginal deliveries must be prepared to handle this unpredictable obstetric emergency. Knowledge of the maneuvers employed for alleviation of shoulder dystocia is relevant not only for obstetric residents and attending house staff, but also for family practitioners, nurses, and nurse midwives. The reported incidence varies in the literature, ranging from 0.2% to 3.0%.

### Pathophysiology and diagnosis

In a normal delivery, after expulsion of the fetal head, external rotation occurs, returning the head to a right-angle position in relation to the shoulder girdle. The fetal shoulder during descent is in an oblique pelvic diameter. After expulsion and restitution, the anterior fetal shoulder should emerge from the oblique axis under the pubic ramus.

Shoulder dystocia represents the failure of delivery of the fetal shoulder(s), whether it be the anterior, posterior or both. Shoulder dystocia results from a size discrepancy between the fetal shoulders and the pelvic inlet. A persistent anterior–posterior location of the fetal shoulders at the pelvic brim may occur with a large fetal chest relative to the biparietal diameter (e.g., an infant of a diabetic mother) or when truncal rotation does not occur (e.g., precipitate labor). Shoulder dystocia typically occurs when the descent of the anterior shoulder is obstructed by the pubic symphysis. It can also result from impaction of the posterior shoulder on the maternal sacral promontory.

Retraction of the fetal head against the maternal perineum accompanied by difficulty in accomplishing external rotation has been called the “turtle

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**Table 56.1** Risk (%) for shoulder dystocia based on fetal weight, diabetic status, and method of delivery

Fetal weight (kg)	Nondiabetic	Diabetic: spontaneous delivery	Diabetic: assisted delivery
4–4.25	5	8	12
4.26–4.5	9	12	17
4.51–4.75	14	20	27
4.76–5	21	24	35

sign.” Most authors have defined shoulder dystocia to include those deliveries requiring maneuvers in addition to gentle downward traction on the fetal head to effect delivery.

The risk of shoulder dystocia increases significantly as birthweight increases; it must be remembered, however, that approximately 50–60% of shoulder dystocias occur in infants weighing less than 4000 g. Even if the birthweight of the infant is over 4000 g, shoulder dystocia will only complicate 3.3% of deliveries. Risks for shoulder dystocia based on known (but not estimated) fetal weight are listed in Table 56.1.

A prior shoulder dystocia has been shown to statistically increase the risk of recurrence. No single associated condition or combination of antenatal factors (such as excessive maternal weight gain, oxytocin use, multiparity, epidural use, precipitate or prolonged second stage of labor) prospectively allows for clinically useful positive predictive values for the antenatal prediction of shoulder dystocia. Thus, shoulder dystocia is largely unpredictable.

## Management

There are no randomized clinical trials to guide physicians in the order of maneuvers that are to be performed. A single randomized trial assessing prophylactic usage of the McRoberts maneuver showed no difference in head-to-body delivery times. The best available evidence shows fetal injury to be associated with all described maneuvers to relieve shoulder dystocia.

The length of delay that results in permanent brain injury will depend on the condition of the fetus at the time that the shoulder dystocia is diagnosed. It may be as short as 3–4 minutes, or as long as 15–20 minutes. Most, if not all, of the commonly encountered shoulder dystocia episodes can be relieved within several minutes.

- 1 The patient should be instructed to stop pushing as soon as the shoulder dystocia is initially recognized.
- 2 Maternal expulsive efforts will need to be restarted after the fetal shoulders have been converted to the oblique diameter, in order to complete the delivery.

- 3 Additional assistance may be obtained by summoning other obstetricians, an anesthetist or anesthesiologist, additional nursing support, or a pediatrician.
- 4 Ask someone to note the time and periodically state the amount of time that has elapsed since the diagnosis of shoulder dystocia.
- 5 The McRoberts maneuver is typically used as the first technique for shoulder dystocia alleviation. This can be done by having the patient grasp her posterior thighs and flexing the legs against her abdomen or by having birth attendants (or family members) flex the patient's legs in a similar position. McRoberts position causes cephalic rotation of the pubic symphysis and flattening of the sacrum. Care should be taken to avoid prolonged or overly aggressive application of McRoberts.
- 6 Suprapubic pressure, commonly administered by nursing personnel, is typically used immediately prior to or in direct conjunction with the McRoberts maneuver. This pressure is usually directed posteriorly, but other described techniques have included lateral application from either side of the maternal abdomen (attempting to flex the anterior shoulder towards the chest) or alternating between sides using a rocking pressure.
- 7 If these techniques fail to accomplish delivery, attempt to deliver the posterior arm. Posterior arm extraction replaces the biacromial diameter with the axilloacromial diameter, thereby reducing the obstructing diameter in the pelvis. Pressure should be applied at the antecubital fossa to flex the fetal forearm. The arm is subsequently swept out over the infant's chest and delivered over the perineum. Rotation of the fetal trunk to bring the posterior arm anteriorly is sometimes required. Grasping and pulling directly on the fetal arm, as well as application of pressure onto the midhumeral shaft, should be avoided as bone fracture may occur.
- 8 If after delivery of the posterior fetal arm, delivery of the baby cannot be accomplished, perform rotation of the posterior shoulder 180° to the anterior position while simultaneously rotating the anterior shoulder 180° to the posterior position. If the fetus is facing the mother's right side, rotation should be attempted in a counterclockwise direction as a first step.
- 9 Some physicians are more comfortable attempting fetal rotational maneuvers before attempting to deliver the posterior arm. In the Woods corkscrew maneuver, the practitioner attempts to abduct the posterior shoulder by exerting pressure onto its anterior surface. In the Rubin (reverse Woods) maneuver, pressure is applied to the posterior surface of the most accessible part of the fetal shoulder (either the anterior or posterior shoulder). If the anterior shoulder is tightly wedged underneath the symphysis pubis, it may be necessary to push the fetus slightly upward in order to facilitate the rotation.
- 10 Shoulder dystocia is a "bony dystocia" and therefore episiotomy alone will not release the impacted shoulder. The need for cutting a generous

episiotomy or proctoepisiotomy must be based on clinical circumstances, such as a narrow vaginal fourchette in a nulliparous patient.

- 11 Attendants should refrain from applying fundal pressure as a maneuver for the alleviation of shoulder dystocia. Pushing on the fundus serves only to further impact the anterior shoulder behind the symphysis pubis. Fundal pressure can be employed to assist with delivery of the fetal body, but only if the shoulder dystocia has already been alleviated.
- 12 Providers should use downward axial traction, which is a pulling force (traction) applied in alignment with the fetal cervicothoracic spine. This is typically along a 25–45° vector below the horizontal plane when the woman is in a lithotomy position. The provider should not attempt to rotate the fetal head.[xn]

## Extraordinary maneuvers

If neither rotational maneuvers nor extraction of the posterior arm is possible, bilateral shoulder dystocia or posterior arm shoulder dystocia may be present. In this case, the anterior arm is lodged behind the symphysis pubis and/or the posterior shoulder is lodged high in the pelvis at or near the sacral promontory. Under these circumstances, consideration should be given to the following “rescue” maneuvers.

### Gaskin maneuver

The mother’s position is rotated 180° from the supine position to one in which the mother is positioned on her hands and knees, with her back pointing toward the ceiling. This change in maternal position is thought to allow for a change in fetal position within the maternal pelvis. An attempt is now made to deliver the posterior shoulder by downward (toward the floor) traction followed by delivery of the anterior fetal shoulder by gentle upward traction.

### Axillary traction

The clinician’s whole hand enters the posterior aspect of the pelvis. The fetal shoulder is located and grasped by sliding the first finger under the axilla and placing the thumb on top of the shoulder. The second finger is placed alongside the fetal humerus to keep the arm firmly against the body. Traction is applied directly through the fetal axilla to follow the sacral curve until the posterior shoulder appears over the perineum.

### Cephalic replacement (Zavanelli maneuver)

The fetal head is rotated back to a pre-restitution occiput anterior position and then gently flexed. Constant firm pressure is used to push the fetal head back into the vagina and cesarean delivery is subsequently performed.

Halothane or other general anesthetics, in conjunction with tocolytic agents, may be administered. Oral or intravenous nitroglycerin may be used as well.

### **Abdominal rescue**

A low transverse uterine incision can be performed, the anterior shoulder manually rotated into the oblique diameter by the surgeon doing the uterine incision, and vaginal delivery accomplished. This requires at least two skilled delivery attendants and should rarely be used.

### **Documentation**

Documentation of delivery maneuvers and the sequence of these maneuvers is an essential part of patient care and risk management. The use of a preprinted form listing important elements is suggested for use in cases of shoulder dystocia, regardless of apparent fetal injury at the time of delivery.

### **Suggested documentation for shoulder dystocia**

- When and how shoulder dystocia was diagnosed.
- Inform patient that shoulder dystocia has occurred.
- Position and rotation of infant's head.
- Which shoulder was anterior.
- Presence of episiotomy, if performed.
- Estimate of head-to-body time interval.
- Estimation of force of traction applied.
- Order, duration, and results of maneuvers employed.
- Additional medical personnel present for assistance.
- Birthweight.
- One-minute and five-minute Apgar scores.
- Venous and/or arterial umbilical cord blood gas evaluation.[xbl]

### **Suggested reading**

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