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Shoulder dystocia: Management and documentation



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ABSTRACT

Shoulder dystocia is an obstetric emergency that occurs when the fetal shoulders become impacted at the pelvic inlet. Management is based on performing maneuvers to alleviate this impaction. A number of protocols and training mnemonics have been developed to assist in managing shoulder dystocia when it occurs. This article reviews the evidence regarding the performance, timing, and sequence of these maneuvers; reviews the mechanism of fetal injury in relation to shoulder dystocia; and discusses issues concerning documentation of the care provided during this obstetric emergency.

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Shoulder dystocia results from a size discrepancy between the fetal shoulders and the pelvic inlet, which may be absolute or relative (due to malposition). A persistent anterior–posterior location of the fetal shoulders at the pelvic brim occurs when there is increased resistance between the fetal skin and the vaginal walls (with accelerated fetal growth), with a large fetal chest relative to the biparietal diameter, and when truncal rotation does not occur (precipitous labor). The overall goal of shoulder dystocia management is to convert the fetal shoulders to an oblique diameter in order to relieve the obstruction before the fetal brain suffers irreversible hypoxic-ischemic injury.

For many years, long-standing opinions based solely on empiric reasoning have dictated our understanding of the detailed aspects of shoulder dystocia management. Recommendations are essentially taken from non-randomized, observational studies. A clear and undisputed stepwise approach to shoulder dystocia management therefore does not currently exist. Each individual provider must take into account the resources available within his/her own

institution and community to design and implement a protocol that will assist in the optimal management of shoulder dystocia. In this article, we present the current evidence for a rational approach to shoulder dystocia management.

Diagnosis

Shoulder dystocia occurs when the fetal shoulders are obstructed at the level of the pelvic inlet. The ultimate diagnosis of this obstetric emergency, however, will not occur until after the fetal head has emerged from the vagina. The “turtle sign,” in which there is retraction of the fetal head against the maternal perineum, is suggestive (but not diagnostic) of the presence of shoulder dystocia. Shoulder dystocia is therefore most commonly diagnosed when there is failure of delivery of the fetal shoulder(s) after initial attempts at downward traction and ancillary obstetrical maneuvers are required. Although other definitions have been reported in the literature, these are not commonly employed in daily

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clinical practice. Two studies have proposed defining shoulder dystocia as a prolonged head-to-body delivery interval of 60 s (the mean + two standard deviations) and/or the use of ancillary obstetric maneuvers.¹ In Hoffman's multicenter study, however, there were only two instances (0.01%) among the 2018 reported shoulder dystocias in which the delivery note documented such a head-to-body time.²

Mnemonics/algorithms

Algorithms (Figs. 1 and 2) depicting a particular sequence in which the maneuvers to manage shoulder dystocia should be employed are not based on high-level scientific evidence. No particular sequence of maneuvers has been shown to be more effective than an alternative sequence. These flow diagrams are, however, helpful from a planning and training perspective, as the emergent nature of shoulder dystocia is a barrier to performing interventional research. In addition, these protocols have attempted to provide a simple standardized approach to handling shoulder dystocia. Distinct features of the protocol espoused by Inglis et al.³ include a "hands-off" procedure (no traction on the fetal head) once shoulder dystocia has been called and assessment of the position of the anterior shoulder by the delivering provider. In Grobman et al.'s protocol, the delivery provider first unambiguously announces that a shoulder dystocia is present. The delivery provider then proceeds to alleviating maneuvers, while the patient's primary nurse uses an emergency call button to summon other relevant staff (Fig. 2).⁴ Mnemonics such as BE CALM⁵ and HELPERR⁶ (Fig. 3) have also been designed as memorization tools.

First-line maneuvers (external manipulations)

The McRoberts' maneuver is commonly cited as the initial immediate approach for alleviation of shoulder dystocia. This maneuver is performed by having the gravida hyperflex her thighs toward her abdomen. This straightens the sacrum with respect to the lumbar spine and decreases the angle of inclination of the pelvis.⁷

Suprapubic pressure is applied directly downward onto the anterior presenting shoulder or using a rocking motion from the fetal back toward the front. The aim of this maneuver is to decrease the bisacromial diameter by adducting the anterior shoulder and to deflect the bisacromial diameter to an oblique plane. The combination of the McRoberts' maneuver and suprapubic pressure will alleviate the majority of cases of shoulder dystocia.¹

Second-line maneuvers (internal manipulations)

Rotational maneuvers routinely performed include the Rubin II maneuver and the Woods corkscrew maneuver. The Rubin II maneuver is performed by placing a hand into the vagina and applying pressure to the posterior aspect of the most accessible fetal shoulder. The shoulder is then pushed toward the anterior surface of the fetal chest. The mechanism of this

maneuver is by adduction of the fetal shoulder, which reduces the bisacromial diameter allowing for the anterior shoulder to be rotated and dislodged from behind the pubic symphysis.⁸ The Woods corkscrew maneuver is performed by placing the fingers on the anterior aspect of the posterior fetal shoulder and rotating the shoulder toward the fetal back.⁹ The mechanism for this maneuver is attempted rotation in a 180° fashion to allow descent with rotation, much like the movement of a threaded screw when rotated.

Several techniques to deliver the posterior shoulder have been described. The most widely employed method is extraction of the posterior fetal arm. To approach the posterior arm, the delivering clinician's hand is placed in the vagina and the humerus of the posterior fetal arm is traced from the shoulder to the elbow. Once the forearm is grasped, it is swept across the fetal chest and the arm is pulled out of the vagina. If the forearm is not accessible, pressure can be placed on the antecubital fossa to flex the elbow. If this allows access to the forearm, delivery of the posterior arm is accomplished as described above. If the forearm is still not accessible, attempts are then made to deliver the posterior shoulder or to make the posterior arm accessible using posterior axillary traction methods. Menticoglou¹⁰ described a technique of utilizing finger traction to accomplish axillary traction. The technique starts by having an assistant hold the fetal head upwards, avoiding traction. Then the operator's two middle fingers are placed from each side of the posterior fetal shoulder and into the axilla. Downward and outward traction is then placed on the posterior shoulder to follow the curve of the sacrum. As the shoulder comes into view, the posterior arm is delivered as previously described. Another method of performing axillary traction is the use of a sling. Hofmeyr and Cluver¹¹ described a technique of applying axillary traction utilizing a sling fashioned from a size 12- to 14-Fr suction catheter. In this technique, the suction catheter is passed over the shoulder and around the axilla. The two free ends of the catheter are clamped, and downward traction is utilized until the shoulder descends enough to allow for delivery of the posterior arm.

Preferred maneuvers and sequence

McRoberts' maneuver and suprapubic pressure are appropriate first-line techniques as they are non-invasive, easy to learn, and can be performed quickly. We believe that it is reasonable to consider performing delivery of the posterior shoulder/arm as the next maneuver in this sequence. The ultimate decision for this, however, should be based on provider experience and the clinical situation. If delivery of the posterior arm is unsuccessful or cannot be attempted, then rotational maneuvers such as Rubin II or Woods corkscrew can be performed.

In Grimm's computer modeling evaluation, posterior arm delivery required the least exogenous force to effect delivery and resulted in the lowest brachial plexus stretch.¹² This decreases the impacted diameter from the bisacromial diameter to the axillo-acromial diameter. The end point of posterior arm extraction is to substitute the axilloacromial diameter for the bisacromial diameter, with the former being approximately 3 cm shorter than the latter.¹³ Geometric analysis has revealed

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