The "All-Fours" Maneuver for the Management of Shoulder Dystocia

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Abstract:
The "all fours" maneuver for managing shoulder dystocia appears to be a rapid, safe and effective technique in women in labor with this problem.

We report a case of shoulder dystocia managed successfully with complete vaginal delivery and no injury to mother and newborn after using the "all fours" maneuver. A brief literature review includes descriptions of other maneuvers for the problem of shoulder dystocia.

Key words: Shoulder dystocia, management, all-fours maneuver

Introduction:
Shoulder dystocia is an infrequent obstetric emergency and often unpredictable complication of delivery that requires rapid and well-coordinated action from birth attendants. Shoulder dystocia is defined as difficulty with delivery of the shoulders, after head delivery when one or both of the shoulders fail to enter the pelvis. Most commonly the shoulders remain in an antero-posterior axis with the anterior shoulder caught on the pubic symphysis and the posterior shoulder resting in the sacral hollow. Less commonly both shoulders remain at the level of the inlet, when the vertex delivered the fetal neck is placed under significant stretch. The head is drawn tightly up against the perineum and restitution fails to occur.

Shoulder dystocia also defined as any delivery that does not respond to normal downward traction on fetal head and which requires additional maneuvers.

The overall incidence of shoulder dystocia may be as high as 1.2% although if strict definitions are used it is likely to be 0.33%. Al Hadi M, et. al. reported an incidence of 0.57% and this incidence increased significantly with birth weight, the highest incidence of 3.5% was noted in the weight group of 4500 g. The aim of this report is to share the author's experience with the "all-fours" maneuver which provides rapid, easy and effective management of shoulder dystocia.

Case Report:
A 36-year-old Indonesian woman, BMI 30kg/m², gravida 5, para three and one miscarriage, all previous babies alive and well, birth weights ranged 3.2-3.5, full term pregnancies and normal deliveries, with the last child born 7 years ago, was admitted to the labor room at term (40 weeks gestation) in the active phase of labor. Antenatally she had gained 11.8 kg, her 50 g glucose screening test was high 9.5 mmol/L but her oral glucose tolerance test (GTT) was normal.

She progressed normally in the first stage of labor apart from Category 2 tracing of the electronic fetal monitoring in the last hour 3 (Category 2 guidelines are not predictive of abnormal fetal acid-base status but continued surveillance is required, taking into account clinical circumstances). Her second stage of labor was prolonged - a duration of one hour and 15 min with the woman in lithotomy position for the last 45 min - the fetal heart rate tracing in the last 30 min of the second stage showed Category 3 tracing which, by definition, is an abnormal FHR tracing requiring prompt evaluation and intervention; the abnormality was persistent variable decelerations which became deeper and were slow to return to baseline. Operative vaginal delivery was applied by the Senior Obstetrician. The difficulty of the situation and the procedure of vacuum extraction delivery were explained to the woman before Kiwi Omny vacuum was used. After the second pull the head was delivered but as the anterior shoulder could not be delivered using gentle downward traction on the head, McRobert's maneuver was attempted unsuccessfully; administering suprapubic pressure (after lowering the elevated bed following the vacuum delivery), sustained suprapubic pressure and rocking-motion failed, the Wood's screw maneuver and the reverse Wood's maneuver were applied and delivery of the posterior arm was attempted also but all were unsuccessful. The woman was asked to slowly change from lithotomy to the "all-fours" position (Figure 1). After the woman was on her hands and knees, the obstetrician first delivered the upturned posterior shoulder...
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Figure 1: "All-fours" position

using additional mild downward traction, and then the downturned anterior shoulder using gentle upward traction. The vaginal delivery of the body was accomplished, the maternal perineum was intact and there were no post partum complications.

The time between the delivery of the head and that of the body was seven minutes. The newborn male weighed 3905 g and his Apgar scores were 8 at 1 min and 10 at 5 min, minimal decrease in the movement of the left hand upon stimulation was noticed in the neonatal intensive care unit where he had been admitted for observation. The left hand movement improved on the second day with physiotherapy and moro reflex was normal the next day. A small cephalhematoma was observed, he needed phototherapy for two days and the newborn and the mother were discharged without complications in good condition on the fourth day post partum.

Discussion:

The initial response and action for shoulder dystocia is to call for help; the most senior obstetrician in the hospital must be called along with a minimum of two midwives and a neonatologist. If you arrive on the scene after the delivery has begun, ask for how long the vertex has been delivered and whether there have been Cardiotocograph Abnormalities (CTG) to determine the degree of urgency required.

In all cases downward traction on the fetal head will have failed already (as by definition shoulder dystocia is any delivery that does not respond to normal downward traction on the fetal head and which requires any additional maneuvers.), therefore do not be tempted to use further traction until another corrective maneuver has been effected.

Mc Robert's maneuver is the first intervention to be attempted as it is simple to perform and effective in over 50-90% of cases 2, 5, 6. Two assistants are required, one to hold each leg. By flexing at the knee and the hip the maternal thighs are brought to a position resting against the sides of the abdomen. This rotates the pubic symphysis towards the mother's head and reduces the angle of inclination of the pelvic inlet to 10 degrees, helping the anterior shoulder to move off the pubic symphysis and into the pelvis. The maternal lumbo-sacral lordosis is flattened, reducing the extent to which the sacral promontory acts as an obstruction to the posterior shoulder.

Once the position of Mc Robert's maneuver is achieved, mild to moderate traction on the head and neck can be resumed to bring about delivery. If there is still no movement of the shoulders then traction on the vertex should cease. Most guidelines agree that a large episiotomy should be made at this point (or a smaller one extended) although an argument can be made for waiting until suprapubic pressure has been tried. Clearly, shoulder dystocia is a bony problem. However, further manipulations require adequate access to the rest of the fetus and an episiotomy may also help to relieve some of the pressure from the fetal neck. Gurewitsch ED, et al. (7) reported that the addition of episiotomy conferred no benefit in averting neonatal injury. Our patient needed no extra-room for the hand of the obstetricians to perform the internal maneuver and no episiotomy was done.

If Mc Robert's maneuver is unsuccessful then a third assistant is needed to administer suprapubic pressure by bringing the two hands together as for cardiac massage (CPR); sustained pressure from the heel of the lower hand is applied just above the pubic bone. Ideally, this should be directed slightly obliquely in the direction of the fetal chest to adduct the shoulders and direct them to the large oblique diameter of the pelvic inlet. If sustained pressure fails then a rocking motion can be tried. If with the sustained pressure (approximately 30 to 60 seconds) while the delivering obstetrician continued the gentle downward traction on the fetal head, the delivery is still not accomplished the next procedure is the Rubin's II maneuver (as administering pressure in McRobert's maneuver is called Rubin's I) which consists of inserting the fingers of one hand vaginally behind the anterior fetal shoulder and pushing the shoulder toward the chest of the fetus.

If this is still unsuccessful, the Wood's screw maneuver can be combined with the Rubin II manoeuvre. In this Wood's maneuver, the obstetrician puts two fingers of the other hand to approach the posterior shoulder from the front of the foetus and rotate the shoulder toward the symphysis in the same direction as with the Rubin II. With this movement the infant's shoulders rotate and deliver much like the turning of a threaded screw. If delivery is still not completed the Reverse Wood's screw maneuver can be tried. In this maneuver, the fingers of the entering hand are placed on the posterior shoulder from behind and an attempt is made to rotate the fetus in the opposite direction as the Wood's screw maneuver. If this fails also, removal of the posterior arm will also be attempted by inserting the hand into vagina, locating the forearm, the elbow should be flexed so that the forearm may be.
delivered in a sweeping motion over the anterior chest wall of the fetus. If done correctly, first posterior hand then arm and finally shoulder will be reduced, facilitating delivery of the infant. If this attempt fails, roll the patient to the "all fours" position or Gaskin maneuver.

The patient must roll from the existing dossal position to an "all fours" position, the fetal shoulder often dislodges during the act of the turning from the supine to "all fours" position and by providing gentle traction downward the obstetrician can deliver the posterior shoulder first with all intra-vaginal manipulations for shoulder dystocia except the suprapubic pressure. Meenan Al, et. al. instructed all patients with epidural anesthesia to perform a shoulder dystocia drill and practice getting into the "all fours" position, in case it was needed.(8)

Bruner, et. al reported a large amount of clinical experience with shoulder dystocia managed primarily with the all-fours maneuver, they also reported 83% successful management of shoulder dystocia if managed primarily with this maneuver and no-intravaginal manipulation was needed.(8)

Most of the time, women can give birth spontaneously in lithotomy or in a squatting position without assistance but shoulder dystocia do still occur in the squatting position in spite of the pelvic capacity being increased up to 30%.(10)

If the previously described maneuvers, all fail, the techniques of last resort are tried such as deliberate clavicle fracture, or musculo-skeletal and uterine relaxation can be induced with general anesthesia and cephalic replacement followed by caesarean section. The Zavanelli’s maneuver, abdominal surgery and hysterotomy so the surgeon would rotate the fetus through the hysterotomy incision, allowing the shoulders to rotate and vaginal extraction is then accomplished. Symphysiotomy should only be used when all other maneuvers have failed and caesarean delivery capability is not available.(11)

Risk factor for shoulder dystocia are many, either pre-pregnancy like maternal weight, previous history of shoulder dystocia, previous gestational diabetes or macrocosmic infant, obesity, pre-existing diabetes, short stature, advanced maternal age, or ante partum risks as severe shoulder dystocia: A comparison of outcomes. Am J Obstet/Gynecol 2004; 191 (3): 911-916.

Orthopedic injuries also include clavicular fractures, humeral fractures, brachial plexus injuries and cervical spine injuries. Al Saqqa M. et al. reported 83% successful shoulder dystocia in diabetic women and its effect on the route of delivery and the outcome of pregnancy. Qatar Medical Journal 2007: Vol 16, No 1; 30-35.

However, the sensitivity of any one risk factor in predicting shoulder dystocia is very poor, but the combination of "big baby" with another factor is more sensitive, approximately 35% of babies weighing >4500 g where a delay in second stage had occurred, suffered shoulder dystocia.(2)

The poor ability of both clinical and ultrasound assessment to predict fetal weight is well known and this ability deteriorates as fetal weight increases; hence it is easy to miss the truly large baby but also to over-estimate the size of other babies. Seyam Y. S. et al(11) reported 52.4% accuracy in sonographic prediction of fetal weight in 129 diabetic mothers in our hospital. The overestimation was in 50.8% of the estimated fetal weight and 42.9% were underestimated when compared to the actual birth weight. Macrosomia is one of the risk factors but it is worth mentioning that the fifth annual confidential enquiry into stillbirths and deaths in infancy (CESDI) reported shoulder dystocia as the cause of, or major contributor to perinatal death; 25% of those babies weighing less than 4 kg.(12)

Suboptimal outcomes will result from some cases of shoulder dystocia despite the appropriate efforts of those involved; Erb's palsy is the most common so strong traction on the head should not be used. A fetus in good metabolic condition prior to the shoulder dystocia is said to be able to tolerate approximately 10 minutes before a serious risk of hypoxic brain injury ensues. Documentation of the management is essential. Prediction and prevention of shoulder dystocia is difficult but anticipation and preparation is the key to successful management.

References: