Shoulder Dystocia (SD) and Brachial Plexus Palsy (BPP): cause and prevention

George Malcolm Morley, MB ChB, FACOG

10252 E. Johnson Road Northport, MI 49670 Phone: +1 231 386 9687 Fax: +1 231 386 9655 Email: obgmmorley@aol.com

Abstract

The current definition of shoulder dystocia is inconsistent. The American College of Obstetricians and Gynecologists' (ACOG's) Practice Bulletin Number 40 on shoulder dystocia has two pseudo definitions: (1) failure of the shoulders to deliver spontaneously, putting both mother and fetus at risk for injury; and (2) failure of the delivery attendant to deliver the anterior shoulder by gentle downward traction, thus requiring additional obstetric maneuvers. Shoulder dystocia is caused by impaction of the anterior shoulder behind the pubic symphysis. ACOG does not define any cause for brachial plexus palsy; however, moderate or severe downward head traction is implied to be injurious.

A downward tilted pelvis is the major cause of anterior shoulder arrest; it is usually relieved or prevented by McRoberts' position. The mother then spontaneously delivers the shoulders. This is postural shoulder arrest and is not true shoulder dystocia (SD).

Failure of the mother in full hip flexion to deliver the shoulders spontaneously is true shoulder dystocia. Various maneuvers are available to correct this situation; all supplement physiological delivery forces and movements that do not increase traction on the brachial plexus. Resuscitation of the child must be pre-planned.

Brachial plexus injury is a traction injury caused by pulling the head and neck down and away from the shoulder. Nerves may be bruised, stretched, torn or ruptured; nerve roots may be avulsed from the spinal cord.

SD is largely preventable by delivering all patients in McRoberts' or equivalent position. Brachial Plexus Palsy (BPP) is avoidable by never applying head traction at any delivery and using maneuvers to deliver the shoulders that avoid any tension on the brachial plexus.

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1. Introduction

In current, routine, obstetrical practice, inability of the physician to deliver the anterior shoulder by gentle head traction is usually termed shoulder dystocia (SD)[1]. The major predisposing factor is the tilted position of the mother' pelvis [2-3]; the baby is usually large. SD rarely occurs when the hips are fully flexed towards the chin, as in squatting that is the natural childbirth position [3]. The mother can routinely spontaneously deliver the shoulders in this position without obstetrical interference. Inability of the mother to deliver the shoulders in this position defines true shoulder dystocia; it is rare.

Permanent brachial plexus palsy (BPP) is the result of avulsion of cervical nerve roots from the spinal cord. Lifelong defects may also result from complete or partial nerve ruptures that heal incompletely. These are traction injuries that may be produced by the obstetrician applying traction to the head posteriorly and away from the anterior shoulder that is above the publis. This maneuver is taught by ACOG as the routine method to "deliver" the anterior shoulder [1].

2. A critical analysis of ACOG Practice Bulletin Number 40: Shoulder Dystocia.

ACOG's clinical guidelines for management of shoulder dystocia are delineated in *Bulletin Number 40* (BU40) [1]. The initial paragraph that describes and defines shoulder dystocia as impacted shoulders states: *Failure of the shoulders to deliver spontaneously places both the pregnant woman and fetus at risk for injury.*"

This bizarre announcement presages pages of incongruity. The shoulders do not fail; they cannot deliver themselves. A plausible correction reads as follows: "*The pregnant woman's failure to deliver the shoulders spontaneously places her and the fetus at risk for injury.*"

The logical corollary of this corrected statement is:

"The pregnant woman's successful spontaneous delivery of the shoulders does not incur risk of injury to her or the fetus."

The second paragraph (**Background**) contradicts the first, stating that shoulder dystocia is defined as: *a delivery that requires additional obstetric maneuvers following failure of gentle downward traction on the fetal head to effect delivery of the shoulders.*"

The failure in this alternate definition is <u>gentle downward</u> <u>traction on the fetal head</u>; it is **not** a spontaneous maternal function. A more accurate statement of this alternate definition is: *Failure of the obstetrician to effect delivery of the shoulders by gentle downward traction on the fetal head defines shoulder dystocia; additional obstetric maneuvers are required for delivery.*"

In these two definitions there is an enormous disparity in the forces used for safe release of impacted shoulders. The utmost physiological efforts of the mother, pushing and straining, can be applied safely; why should the obstetrician's efforts be limited to *gentle* downward traction on the fetal head? BU40 does not inform the reader that downward traction on the fetal head is the primary cause of most neonatal brachial plexus injuries.

BU40 then continues with a very cryptic comment: "... Because the delivering attendant must determine whether ancil-

lary maneuvers are actually necessary, the diagnosis of shoulder dystocia has a **subjective** component."

The subjective component is the word "gentle"; it modifies the objective word "traction"; the combination is almost oxymoronic. When this subjective diagnostic maneuver fails to deliver shoulders, does the diagnosis of shoulder dystocia have a subjective component <u>because</u> the delivering attendant must determine whether the shoulders are actually impacted? Or is the subjective component inherent in the definition regardless of actual shoulder impaction? If the delivering attendant must determine actual impaction after failed gentle traction, the diagnostic maneuver is not diagnostic of impaction!

In translation: Gentle head traction" is a subjective force and failure of gentle head traction does not actually establish the fact that a shoulder is impacted; because of this, the delivering attendant must determine what to do next."

Thus failure of gentle traction does *not* define shoulder dystocia and, being subjective, gentle traction carries risk of injuring the brachial plexus. Bulletin 40 offers no guideline or procedure to confirm impaction of the shoulder. As a diagnostic or therapeutic maneuver, gentle traction is pointless, useless, and it can be misleading; it is not risk free.

"The urgency of this event makes prospective studies [of maneuvers for release of impacted shoulders] impractical."

The urgency of this event makes all retrospective studies of shoulder dystocia that follow failure of "gentle head traction" irrelevant, because the urgent severity of the traction force that precedes "Shoulder Dystocia" is not only subjective for the operator, it is not recorded objectively on the chart for the retrospective investigator. Head traction for delivery of the anterior shoulder is taught and used routinely. By the time the operator realizes that traction is failing, the traction is seldom gentle and always unrecorded. The gentleness of the traction force may be recorded objectively on the child.

Under "What should the obstetrican do in cases of shoulder dystocia?" BU40 alleges that fundal pressure by the obstetrician should not be used, stating: "Fundal pressure may further worsen impaction of the shoulder and also may result in uterine rupture." This implies that shoulder impaction is injurious [4-5]. BU40 also implies that spontaneous delivery of the shoulders by the mother is free from risk. Spontaneous delivery is accomplished by very forceful pushing – closing the glottis and strongly contracting the intercostal muscles, diaphragm and abdominal muscles during a uterine contraction. This creates maximum pressure on the fundus of the uterus. This **fundal pressure** worsens impaction ... and then delivers the impacted shoulder safely, with no risk at all!

It would seem appropriate for ACOG to replace *gentle* downward traction on the fetal head with gentle fundal pressure as a diagnostic tool for shoulder impaction. Gentle fundal pressure is subjective, but has probably very low to zero risk.

Under *Neonatal Complications*, BU40 states that less than 10% of brachial plexus injuries result in permanent disability; BU40 offers no explanation for this disparity and follows up with: "*Data suggest that a significant proportion (34 – 47%) of brachial plexus injuries are not associated with shoulder dystocia; in fact 4% occur after cesarean delivery* [6-9]."

This strongly suggests that impaction of the shoulder, or any proximity of the shoulder with the pubis is **not**, of itself, the

primary injurious factor, and BU40 cannot identify any procedure that is more injurious than another.

Head traction is not identified as an injurious factor at all. BU40 fails to point out that almost <u>every</u> delivery, with or without shoulder dystocia, has been subjected to gentle head traction (with subjective gentleness) including cesarean sections.

"It is clear that brachial plexus injury can occur regardless of the procedure or procedures used to disimpact the shoulders [10-13]."

This is not particularly surprising when it is understood that shoulder impaction, of itself, is not injurious. It may be resolved harmlessly by maximal maternal effort. Why should it not be resolved harmlessly by other efforts that reinforce or mimic physiology? However, brachial plexus injury does occur in cases of shoulder dystocia; if the cause of injury is not associated with harmless resolution of shoulder dystocia, and physiology is not causal, the only logical remaining origin of BPP is a routine, subjective, injurious diagnostic procedure that has no diagnostic or therapeutic value – (gentle) head traction.

Bulletin 40 concludes that SD cannot be predicted or prevented; so neither presumably can its associated injuries. The only recommendation for the practicing obstetrician is, "*There is no evidence that any one maneuver is superior to another in releasing an impacted shoulder or reducing the chance of injury. However, performance of McRoberts maneuver is a reasonable approach.*"

The words "traction on the fetal head" appear only once in the entire Bulletin 40. The omission of any reference to the serious brachial plexus injuries that result from excessive or even moderate traction on the fetal head, or any correlation of these injuries with head traction, and the lack of any warning to the practicing obstetrician to avoid these maneuvers, renders BU40 seriously delinquent as a guideline for the profession.

3. Objective and method

The following presentation is based on 38+ years of private obstetrical practice and five years of retirement occasional research. The objective is to prevent neonatal brachial plexus injury by comprehension and avoidance of its cause. The primary premise in this article is that physiology is harmless, that physiological childbirth cannot result in brachial plexus injury. The peer-review references are those used in ACOG's Bulletin 40. Arguments and opinions are based on understanding the anatomy and physiology of childbirth—basically the Passages, the Passenger and the Powers. These may be explained more comprehensively in older texts. Most insights, caveats and guidelines were developed in hours of quality assurance sessions with dedicated colleagues over the years. Statistical data, proof, probabilities and indications are avoided—an intact neonate should not be a matter of chance.

4. The varieties of Shoulder Dystocia

In current obstetrical practice, so-called "SD" is established when the obstetrician fails to deliver the anterior shoulder using (gentle) head traction. By this time, cervical nerve root avulsion may have already occurred. When the patient, having delivered the head in hip extension and had the shoulder "tested", is put in hip flexion, (McRoberts) the shoulder often easily delivers spontaneously and the "SD" disappears, becoming phantom. It never happened. The nerve root avulsion becomes life-long BPP – without cause.

Squatting is the reflexive (physiological) position adopted by humans to push any object from the pelvis. Squatting aligns the bony pelvic inlet at right angles to the straightened lumbar spine; intra-abdominal pressure thus exerts maximal expulsive force at the pelvic inlet. McRoberts' position is squatting lying down on the back; "all fours" is squatting on the hands and knees. The left-lateral position is squatting on the left side with the right knee beside the chin.

Definition: True SD is inability of the MOTHER in any "squatting" position to <u>spontaneously</u> deliver the shoulders of the child after spontaneously delivering the head.

All vaginal deliveries should be conducted in the above "squatting-type" positions; both shoulders should be allowed to deliver without the obstetrician / midwife touching the child. If shoulder arrest occurs in any other position, e.g. stirrups with the thighs extended, or with the feet on the bed, the patient's position is a contributing factor or the cause of the complication; it is usually "phantom" SD.

A good analogy for understanding positional SD is putting a round peg through a round hole. The peg goes through easily when inserted at right angles to the opening; when inserted at an angle it arrests at the opening. With hips extended and feet on the bed, the round inlet of the pelvis is tilted at an angle to the oncoming shoulders; the posterior shoulder enters the back of the pelvis and the anterior shoulder then lodges on the pubis —the "peg" enters obliquely. In the squatting position, with the inlet plane at a right angle to the descending shoulders, both shoulders enter the pelvic inlet together or the anterior shoulder enters first.

5. The anticipated large baby

The bony pelvis is a curved tube, the sacrum being the long concave border, the symphysis the short convex border. During labor, the fetal shoulders are normally hunched forward and upwards towards the chin, in the neck region. With descent into the pelvic inlet, the shoulders may swing laterally and downwards on the antero-lateral chest walls. With a very large baby, the resultant "diameter" may exceed the diameter of the pelvic inlet, leading to bilateral shoulder impaction. This is uncommon; usually, one shoulder enters the pelvis first and progresses in the "hunched" position; the other follows at an oblique angle at the opposite side of the pelvis on the chest wall. If the pelvic inlet is tilted down, (feet on the bed, not squatting) the posterior shoulder is likely to enter the true pelvis first and travel along the sacral curve with the anterior shoulder arrested and trailing in the shoulder dystocia position above the pubic symphysis.

Progress is much easier if both shoulders enter or the anterior shoulder enters first—the anterior shoulder delivers after traversing the short posterior length of the symphysis. Delivering the head in an exaggerated McRoberts position (knees to ears with a nurse assisting each leg, curling the sacrum off the bed) facilitates anterior shoulder entry into the pelvic inlet—the lumbar lordosis is reversed to a mild kyphosis and the symphysis public superior to the promontory of the sacrum.

As the head delivers, the anterior shoulder enters the pelvic inlet and is beneath the symphysis ready to deliver while the posterior shoulder is still in the abdomen. If the anterior shoulder does not immediately follow the head, the "managing team" is well advised to keep the patient in exaggerated McRoberts and wait for the next uterine contraction before going into "full court press" to deliver the shoulder. They may be too lawyerterrified to use fundal pressure; however, a strong uterine contraction is a good substitute. Putting the feet on the bed between contractions may rotate the symphysis over the shoulder and cause impaction.

If shoulder arrest occurs in any "squatting" position, <u>it is true</u> <u>shoulder dystocia</u>. It is a major obstetrical emergency. Correction of the pathogenic anatomy and physiology AND AVOIDING HEAD TRACTION should prevent any possibility of permanent neurological injury. True shoulder dystocia occurs when both shoulders, displaced down the chest wall, constitute a diameter that is greater than is the pelvis. Correct vaginal management involves delivering one shoulder through the **outlet** of the pelvis before delivering the other shoulder – without causing any permanent injury.





6. Brachial Plexus Palsy

Permanent Brachial Plexus Palsy (BPP) results from the delivering attendant pulling the head and neck away from a shoulder girdle that is fixed behind the pubic symphysis, thus stretching and rupturing cervical nerves, and possibly avulsing nerve roots from the spinal cord (Fig. 1). Healing may produce some neurological improvement; in the case of spinal cord injury, it never heals. Nerve stretching, partial and complete nerve ruptures often result in permanent disability.

The "head traction" maneuver has been taught for years (Williams Obstetrics) as the "normal" method of delivering the anterior shoulder at every delivery; "gentle" traction is advised. Brachial plexus injury will inevitably occur depending on the fragility of the infant's tissues (that can never be predicted) and the degree of "gentleness," (that in a panic situation is always "extremely gentle."). This spinal cord /brachial plexus injury is preventable by NEVER PUTTING ANY TRACTION ON THE HEAD AT ANY AND EVERY DELIVERY, AND BY THE MOTHER SPONTANEOUSLY DELIVERING THE SHOULDERS, OR BY USING METHODS THAT AVOID TENSION ON THE BRACHIAL PLEXUS AND THUS AVOIDING NERVE ROOT TRAUMA.

Transient Brachial Plexus Palsy is due to bruising or tension damage of the peripheral nerves remote from the spinal cord. It occurs with peripheral nerve stretching without nerve root avulsion from the cord. If the neurons in the cord and their axons are intact through a peripheral nerve sheath to the site of injury, healing of the nerve is possible. Bruising or pressure paralysis usually resolves within days. If a peripheral nerve is ruptured with displacement and misalignment of axon sheathes, healing may take months and the end result may be incomplete recovery with residual permanent defects persisting. Spinal cord injury never heals.

7. Bilateral Shoulder Dystocia—"Turtling"

It is virtually impossible for a mother to deliver the head if **both** shoulders are arrested above the bony pelvic inlet. In this circumstance, "turtling" of the head occurs – the head repeatedly distends the perineum then retracts into the **mid** pelvis. When the head distends the perineum **and stays in that position**, distending the perineum **between** contractions and pushes, one shoulder, often the posterior shoulder, has entered the true, bony pelvis, and should be deliverable **after the head has been delivered <u>spontaneously</u>. If the patient is in exaggerated McRoberts position, an antero-lateral shoulder may enter the pelvis and follow the head quickly and spontaneously.**

If "turtling" persists for 15 minutes or more, stop the labor and section the patient. Never attempt to use forceps or suction to deliver a "turtling" head; this carries high risk of avulsing nerve roots—on both sides of the neck. If a patient in McRoberts position cannot spontaneously deliver a head that has been on or near the perineum for 20+ minutes, c-section is a much safer option than forceps, especially if the heart tones are "non-reassuring." Cesarean section, when combined with physiological closure of the umbilical vessels after delivery, is a very safe procedure for mother and child. Operative vaginal delivery in these circumstances is much less safe; it involves head traction that is not gentle. Persistent Occipito-Posterior position may mimic this scenario. If easy manual rotation to occiput anterior position is not accomplished, choose the safe way out. A large POP baby can also have large shoulders.

8. Understanding Risk

Once the head is **spontaneously** delivered and the anterior shoulder is above the pubis, the head reverts to the occiput lateral position and stays against the perineum. It often becomes very blue/black and congested. The shoulder behind the symphysis pubis is displaced inferiorly down the infant's chest wall; displacement is limited by the bony attachments at each end of the clavicle, preventing excessive tension on the brachial plexus and nerve roots. At this point, it is of paramount value to understand **all** the risks to the child. Both shoulder girdles and arms are displaced onto the chest wall and are compressing the thorax <u>and the heart</u> to the point that venous return is severely compromised – the child may be in virtual cardiac arrest. To avoid brain damage [14-15], resolution of the situation needs to be timely—within 5 to 10 minutes—and post-partum care should also be appropriate for this situation. With this in mind, please remember that panicked pulling, twisting or turning the head is the <u>most disastrous course of action</u>. DO NOT TOUCH THE HEAD, and NEVER CLAMP A NUCHAL CORD. Digital examination (performed gingerly, not gently) can confirm an anterior clavicle and objectively diagnose an impacted anterior shoulder. <u>For any and all maneuvers, full</u> maternal hip flexion should be maintained.

9. Fundal pressure/supra-pubic pressure

To effect delivery of the anterior shoulder, the simplest, safest, and often most effective maneuver is **supra-pubic pressure** combined with <u>fundal pressure</u> during a contraction with the patient pushing (Fig. 2). Fundal pressure enhances the patient's natural expulsive efforts and helps to drive the **supra-pubic depressed shoulder down, under and out from** the symphysis; this decreases tension on the nerve roots and prevents avulsion. Supra-pubic pressure used alone often results in the shoulder simply returning to its original position on release of pressure. If the head is touched at all, it should be gently, gingerly supported towards the symphysis.





Testifying professors and trial lawyers have demonized fundal pressure with phony rhetoric about "impacting" the shoulder —to the point that the profession has been deprived of one of the most effective and safe procedures in preventing BPP. Note that fundal pressure is used almost routinely and harmlessly during c-section.

It is impossible for fundal pressure to avulse nerve roots; it supplements the physiological efforts of an often-exhausted mother and moves the shoulder girdle **TOWARDS** the neck of the child, lessening tension on nerve roots. If regional anesthesia is compromising maternal effort, fundal pressure is a very safe solution. To my knowledge, BPP has never been reported following spontaneous birth (without any physician interference) while spontaneous clavicle fracture is not rare in spontaneously delivered large babies. Head traction is a completely unnatural force that displaces anatomy in a manner that never occurs physiologically.

10. Posterior shoulder delivery/rotation

Alternatively, the posterior shoulder may be delivered using axillary traction (finger in axilla while supporting the head **towards** the anterior shoulder and using uterine contraction, patient pushing and **fundal pressure**) or the Wood's corkscrew maneuver may be employed (finger in axilla, rotate towards the face) if rotation exit round the pelvis appears easier than straight-out axillary traction. Ample lubrication of the vagina and all fetal parts is helpful. Note that these maneuvers bring the posterior shoulder off the chest wall and off the heart while lessening tension on both brachial plexuses.

These maneuvers are facilitated in the "all fours" position kneeling in the knee-chest position. (Gaskin position) The head and neck naturally gravitate towards the pubis and the anterior shoulder, lessening anterior nerve tension and opening the posterior volume of the pelvis to movement and expulsion of the posterior shoulder.

11. Clavicle Fracture

If the posterior shoulder is high, and difficult to move, a very effective method of delivering the anterior shoulder is to fracture the anterior clavicle between index and middle fingers, and the thumb, the fingertips lifting the bone towards the skin to avoid trauma to deeper tissues while pushing the head and neck in posteriorly. (See Meigs.) This fracture collapses the shoulder girdle into the neck and off the chest wall, taking all tension off the nerve roots and pressure off the heart. The child then usually delivers easily – with or without fundal pressure. In high arrest of the posterior shoulder, applying anterior traction to the head may injure the posterior brachial plexus.

Clavicles often fracture with supra-pubic pressure; with deliberate fracture, care should be taken merely to bend the bone to avoid blood vessel trauma from the fracture site. Bone fractures heal easily; the spinal cord fracture never heals. Humerus fractures are not infrequently reported. They can occur with delivery of the posterior shoulder or with rotation; they heal, and are of no permanent consequence. When minutes are ticking by with bradycardia on the monitor and nothing seems to work, clavicle fracture can be a valuable procedure. So can fundal pressure.

12. Resuscitation

After both shoulders are delivered, bilateral axillary traction (with **<u>fundal pressure</u>** and patient pushing) is often needed to deliver the massive trunk of these macrosomes, and squeezing through the tight pelvis has an exsanguinating effect, milking blood out of the chest, heart and upper abdomen (liver) into the legs **and into the placenta**. These "whoppers" are usually born

limp with blue/black heads, ashen-pale bodies and placentas engorged with blood. **DO NOT CLAMP THE CORD!**

Lower the child well below the vulva and monitor the cord pulse rate. If it stays above 100 bpm and the pulse is vigorous, the child is not hypoxic and is in no danger; aspirate the mouth and pharynx and stimulate breathing with a very cold, wet sponge on the chest or buttocks. If there is no sign of respiration after a minute or so, bag mask the child. Usually the 5-minute Apgar will be ten. If the cord pulse rate persists below 100 bpm for one minute, strip all available cord blood into the child, clamp the cord and hand the child to the neonatologist.

If you follow ACOG's instructions and clamp the cord immediately for a cord pH, you will have a child with a perfect brachial plexus and most of its blood volume in the placenta. You may watch it degenerate through retraction respiration, convulsions and HIE and eventually CP. Ischemic encephalopathy is avoidable by allowing normal placental transfusion to occur [14-15].

The umbilical arteries constrict and stop pulsating in response to high oxygen tension in arterial blood – **produced by** <u>functioning lungs</u>. Thus a pulsating cord indicates that the lungs are not yet completely functional and the placenta is oxygenating the child; the fetal circulation is still operative, the adult circulation is not yet established. There is no rational indication for clamping an intact, pulsating cord. <u>Don't do</u> <u>it!</u>

In summary:

- Deliver ALL patients in McRoberts' / "squatting positions."
- 2. NEVER PULL A HEAD; THAT MEANS NEVER USE GENTLE TRACTION ON A HEAD.
- 3. Section repeated turtling heads. *If true shoulder dystocia occurs*, use:
- 4. McRoberts + Suprapubic pressure + Fundal pressure + contraction + patient pushing
- 5. And/or Posterior axillary traction, rotation deliver the posterior arm
- 6. And/or Fracture of the anterior clavicle
- 7. DO NOT CLAMP THE CORD

13. Discussion

Despite all the academic studies on predicted birth weight, statistical probabilities of diabetes screening etc., sectioning macrosomic or turtling babies, and delivering all patients in McRobert's position, most practicing obstetricians / midwives will some day, sometime be confronted, out of the blue, with a purple-black face that retracts into the perineum to the utter dismay of all attending personnel. Shoulder dystocia can be the most soul trying of obstetrical complications, and thorough warning and education must precede first-time exposure of the new obstetrician to this situation. That education / indoctrination should include <u>NEVER ATTEMPTING</u> to deliver the shoulder of <u>ANY</u> baby by head traction.

The following is the advice of a "hands on" professor who did not review charts and statistics after the fact.

In 1842, in the text, *A Philadelphia Practice of Midwifery*, Professor Charles Meigs wrote:

"If the shoulders should not rotate, so as to bring one of them under the arch, that motion may be given by one or two fingers introduced, and made to act against the shoulder nearest the pelvis so as to draw it into its proper place. If difficulty occurs and the shoulder does not advance, press the child back against the edge of the perineum, and that will often afford room for the advance of the shoulder ... sometimes the shoulder nearest the sacrum, and at others that nearest the pubis escapes first. The student will, in practice, readily perceive which one he ought to assist; he will try one, and then the other, being uncertain which is likely to come first.

"It is considered bad practice to drag out the body, except in very particular circumstances – the womb and abdominal muscles are sufficiently powerful for that object; and if it be permitted to come away slowly, we shall have a more complete contraction of the womb, and a more ready detachment of the placenta. Therefore, it is better to leave the expulsion of the body to nature, merely removing any cause of delay that may obviate its descent and escape. Where the delay is great, and the child becomes very black in the face, and the respiration is not established or in an unpromising condition, we are fully warranted to expedite the delivery, by making use of one or more fingers, fixed as a blunt crochet, in the axilla.

"As soon as the child is born, lay it on its back ... If it breathes regularly, it is well; if not, blow suddenly into its face and drop some cold spirit onto the region of the diaphragm. These and a few smart frictions are all that are demanded. The cord should not be cut until the pulsations have ceased."

Cesarean section in 1842 was not an option for Professor Meigs. Everything he did predicated a healthy result for mother and child with vaginal delivery. Can any present day professor match his experience, knowledge and ability? When current statistics and practices are compared with his advice regarding dragging the body, one hesitates to use the word "wisdom" in reference to today's academia.

A recent publication in *ACOG TODAY* is titled, *Shoulder dystocia: a rare but frightening OB complication.* SD is not rare; it is frequent and unreported. When it results in BPP it may be recorded. The United Brachial Plexus Network (UBPN) is a lay organization of thousands of parents of BPP crippled children; UBPN estimates BPP at 3 per 1000 births or higher. Fright and fear come from ignorance. Smallpox was "frightening" until its origin and prevention were understood.

ACOG recommends SD "disaster teams" to be on hand, trained to put patients in McRoberts' position *after* the head traction maneuver has failed and possibly injured the child, using everything *except fundal pressure* to deliver the child. Fundal pressure has been effectively banned from delivery rooms for the past 10 years or more; the incidence of BPP has probably increased over that time. Fundal pressure is not a plausible cause of cervical nerve root avulsion or any other neonatal injury. The only possible way that cervical nerve roots of the brachial plexus can be avulsed from the spinal cord is by pulling the neck away from the brachial plexus. All types of brachial plexus injuries are TRACTION injuries.

Additional illustrations of positional shoulder distocia are given in Appendix 1.

14. Conclusion

Using routine McRoberts'/hip-flexion positions for *every* delivery will prevent most SD and *diagnose true shoulder dystocia*. Physiological childbirth does not result in BPP. Augmenting physiological delivery efforts and positions, and avoiding nerve root tension will prevent BPP. Excessive traction on the head during childbirth results in BPP. Excessive traction on the head cannot be quantified and *any traction* on the head can and should be avoided. Understanding the abnormal form and forces that produce BPP can be used to avoid those abnormalities and prevent BPP. Every child who has a brachial plexus nerve root avulsion has had its head and neck stretched away from the paralyzed arm. To prevent BPP, *never apply any traction* to a baby's head during delivery.

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Appendix 1. Positional Shoulder Distocia Illustrations

Figure 1. Flat-in-bed and McRoberts' position



The pelvic inlet is the red line. The red arrow indicates the force pushing the shoulders into the pelvic inlet. The "Flat in bed" pelvis is tilted, the effective inlet shape is oval, and reduces the area available for shoulder entry. (red oval)

McRoberts' position: the pelvic inlet is at right angles to the oncoming shoulders, providing the maximum area for entry. (red circle) Figure 2. Squatting



The anatomy is the same as McRoberts' position. The expulsive force is aided by gravity.

Figure 3. All fours (Gaskin)



Anatomy the same as McRoberts', but gravity pulls the head and neck towards the symphysis, allowing more room in the posterior pelvis for arm delivery.