Castellino Prenatal and Birth Training
Vacuum Extraction Trauma, Impact and Facilitation

Revised October 2011

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Overview of use and indicators / counter indicators for VE

Description
Vacuum extractors work by applying suction to the head of the baby to assist in pulling the baby out. The modern ones consist of a bell-shaped cup attached to a hose, an air pump and a pressure meter. The first part of the hose runs through a firm tube with a handle on the end. Cups come in several sizes. The largest cup that fits the baby's head is used.

The mother is anesthetized with at least a local. Often she has been given an epidural before the decision to use VE and the anesthesia itself contributed to her inability to effectively push her baby out (Thorp). If her contractions are weak, Pitocin may be given. VE if effective only in conjunction with contractions.

One of the advantages of VE over forceps and CS is that it can be done with minimal anesthesia without the need for a spinal or epidural. In one study from a Singapore hospital of 186 women over a 3-year period, local perineal anesthesia was used in 97% of the cases with a pudendal block being added in 8.6% of the cases. 3% used no anesthesia at all. One woman had asked for an epidural earlier for comfort and one was given general anesthesia (Low, 135).

A lubricated cup is placed on the baby's head, ideally over the posterior fontanelle, as close to the occiput as possible. The OB slowly pumps air out of the cup through the hose, gradually increasing negative pressure or a 'vacuum.' This negative pressure causes the top of the baby's head to be gradually sucked into the cup, forming an artificial caput (head-like expansion) succedaneum known as *a chignon* within the cup. This takes seconds (soft cup) to minutes (metal cup) and creates a firm attachment so the baby's head does not slip out of the cup. Once the baby's head is firmly attached to the cup, traction is applied to the baby's head during contractions and/or maternal pushing. The obstetrician applies traction by pulling on the handle at 90 degree angle from the cup. With the other hand he may push the cup/fetal head posteriorly toward the sacrum to produce a force in the direction of the birth canal (Oxorn and Foote, p 350-352).

See the appendix for pictures of various vacuum extraction heads and the effect of the cup position on the fetal head

History
Experimentation with glass cupping devices is reported as early as 1705. Simpson reported a bell-shaped device in 1848 in Europe, but he preferred the use of the forceps that he designed.

Metal vacuum extractors designed by the German Malmström first became an alternative to forceps in 1954. In 1957 Malmström published a report of instances of a dangerous intracranial bleeding which he called "subgaleal hematoma" in infants born with the use of his VE cup, which he then modified. This and subsequent reports of subgaleal hematoma and cranial injuries in the sixties, seventies and eighties led to lessening of the metal cup's use in the US. However, Oxorn and Foote's 1986 edition mentions only metal, not silicone VE. In the late 80s and early 90s, reports were published comparing the metal with the elastic VE, (Florentino-Pineda; Kuit).

In 1973 a softer, pliable cup made of silicone was introduced by Kabayashi. This is known as a silicone elastomer VE, pliable cup VE, soft cup VE, rubber cup. It was thought that this would produce fewer injuries to the neonate because of its softness and lack of a rigid edge (Florentino-Pineda). In Europe vacuum extraction is frequently referred to as "ventouse" (Fr. soft cup) though this word is also applied to the metal cups. There are now many brands of pliable VE including Silc and Silastic and Tender-Touch as well as several different metal cups including Malmström, Bird and O'Neil (Kuit, p 108).

Differences between Metal and Silicone VE
Numerous studies in the 1980s and early 90s compare different types of vacuum cups, metal vs. soft cups. By 1993, the softer cup was preferred in the US (*Williams Obstetrics*, 572) and the metal was still preferred in Europe (Loghis).

Differences noted include (Kuit; Loghis, Muse, Chenoy):

- The metal cup can sustain greater traction pressure. The pliable cup tends to pop off if the traction is too high. Hofmeyr et al measured the force at which the cups 'popped' off at 10 kg (22 lb.) for pliable cups and 13.4 kg (29.5 lb.) for metal (Muise, p 172).
- The metal cup takes longer to establish the suction. Therefore the pliable cup is preferred when time is crucial such as when it is used during a CS.
- There are less traumas to the baby with the pliable cup.
- The pliable cup, being pliable, can slip off more easily especially with greater pressure and also with more fetal hair or vernix.
- The pliable cup is usually larger (50, 60 cm) than the metal cup (40, 50, 60 cm). It can be bent and folded to be inserted and can mold to any shape head more easily. Some OBs found the metal cup easier to insert because it is smaller.
- Less babies were jaundiced using the pliable cup.
- Subgaleal hematoma is less frequent with the pliable cup (1.6% vs .5%) (Benaron, p 230).

Some hospitals in Europe limit the use of the pliable cup to "lift-out deliveries: low outlet procedures and/or situations in which only a small traction force was anticipated" (Kuit, p 108).

On the other hand, a 1992 Greek study (Loghis) found almost no difference when using either pliable or metal cup VE. They used either form of VE only with fully dilated women with fetal head in the midpelvis and traction applied only during contractions. Other studies had found a higher rate 20% of 'detachment' or popping off with the pliable cup as compared with 9-10% for either metal or pliable. They attribute this to the use of the pliable cup before full dilation. They did note that in the case of detachment, the pliable cup was gentler for the baby than the abrupt separation found with the metal cup which could cause lacerations on the fetal skull.

Prerequisites for vacuum extraction
The American College of Obstetricians and Gynecologists (ACOG) recommends that the same prerequisites as forceps be met before vacuum extraction is employed. VE prerequisites are:

- Fully dilated cervix
- Membranes ruptured
- Engaged fetal head
- Facilities to perform a cesarean section should be readily available

Indicators for VE are:

- Inability of the fetus to complete the labor. Fetal distress
- Inability of the mother to push
- Obstructions of soft tissue
- Decision to not have the mother push (valsalva maneuver) if she is predisposed to heart attack or stroke because increased intrathoracic pressure puts her at risk.

Contraindicators for VE are (*Williams Obstetrics*, p. 572):

- 1st stage of labor (medical). Inertia of the labor. Extraction traction must be accompanied by forward movement of the baby.*
- Breech presentation (after-coming head)
- Face presentation or other non-vertex presentations
- Fetal coagulation difficulties (coagulopathies)
- If the fetus's head is bleeding following scalp blood sampling. However, the use of fetal scalp electrodes in some hospitals often precedes VE (Low, 136) and is not considered a counterindicator.
- Extreme prematurity. Many hospitals will not use VE on any preterm babies.
    - Preterm babies 3.385-5.5 pounds were found to be no different in outcome than non-assisted preterm babies by Morales, et al but they did notice a larger number of lower apgar scores at 5 min among the VE babies.
    - Low birth weight for gestation babies have a higher than normal incidence of retinal hemorrhage. This is even higher when they are delivered by VE. Retinal hemorrhage is also associated with rapid second stage, with VE followed by forceps and with fetal acidosis (Williams, M. et al).
    - Macrosomia (head too large)

*ACOG discourages the use of VE if the mother's cervix is only partially dilated. Oxorn and Foote(1986, p 349-350) list partial dilation as a relative contraindicator, saying it can be used with only 4 cm dilation. However, they also say it takes longer and that the upper time limit is 30-45 minutes. Recent studies indicate this extra time is dangerous to the baby.

Williams Obstetrics describes as "worrisome" the tendency to use VE at zero station or higher (p 572).

Comparison of VE and Forceps

In the US it is thought that the VE rate is 2 to 3% of all deliveries. In the US, forceps are preferred over VE.

Hillier and Johanson (1994) report that in Europe ventouse (VE) is generally favored over forceps when assisted vaginal delivery is chosen. However, in the world as a whole, forceps are more frequently used, especially in English speaking countries. Forceps were preferred in the USA, Canada, UK, Australia and the Czech Republic. VE is reported to be used more often in Denmark, Finland, Greece, Hungary, Israel, the Netherlands and Slovenia. The forceps rate in the UK is reported to be 13.3%. Hillier and Johanson state:

> Current evidence suggests that the ventouse should be chosen first, principally because it is significantly less likely to injure the mother. The Silc-cup has the advantage of reduced scalp injuries and is suitable for use in over 50% of cases. Where forceps continue to be preferred, note should be taken of published figures relating to the inappropriate (often 19th century) design of the forceps in common use. Alternative (current) designs in forceps are available (e.g. divergent forceps or Moolaoker)

Lucus reports that VE have all but replaced midforceps deliveries. The increase in CS births (48% from 1980 to 1987. As of 1996 the US CS rate was about 22 - 23% nationally) have kept the VE rate to about 2 -3 %.

In the mid 1980's to the mid 1990's many US physicians began to favor VE over the use of forceps The following advantages were listed in 1986 by Oxorn and Foote (p 350)

- VE causes less intracranial pressure than forceps ($1/20^{th}$) at 18 pounds of pressure for VE.
- Because the VE does not have to fit into the birth canal alongside the fetal head, there is far less injury to the mother's tissues.
- As the fetus rotates, the VE can move with it in a way the forceps cannot. This allows the fetus to find the path of least resistance, (assuming the OB is following, not leading).
- The VE can be applied at less than full dilation.
- The VE can be applied when the head is at a higher station.

The last two points, less than full dilation, and use at higher station are advantages over forceps but are associated with greater risk for the baby than VE at full dilation and

lower stations. They are currently discouraged by many hospitals and researchers because of the risk of subgaleal hematoma.

In 1993 *Williams Obstetrics* (p 573) reported:

> It seems reasonable to conclude that delivery with the new soft cup vacuum extractors results in less maternal trauma and blood loss than forceps. It also appears that use of these new vacuum devices is not associated with an increase in serious neonatal morbidity when compared with forceps, although there is an increase in the frequency of cephalohematomas and retinal hemorrhage with the use of these instruments. Finally, considering that the indications and prerequisites for forceps and vacuum are the same, the choice of instruments must be based primarily on the experience of the operator. Neither instrument should be applied prior to the engagement of the fetal head.

Other comparisons:

- VE can be done with less anesthesia. A local is sufficient and an epidural unnecessary (Low, p 135).
- The mortality rate is .6% for VE which is considered low (Bernaron, p 231).

The incidence of subgaleal hematoma is relatively small. Of much greater concern is the effect on every baby born by VE. They all have traction vector patterns and corresponding lesion patterns that have never been seen until the advent of VE. This may be more damaging than the effect of forceps and will be discussed further in the section on the cranium.

Dangers of VE

- Retinal hemorrhage. This usually seems to resolve but studies of children have found some with "altered psychosocial functioning and visual function abnormalities". There is some question about whether the cause is VE or other factors associated with retinal hemorrhage, including acidosis (umbilical cord pH <7.2), short second stage (less than 30 minutes) and low birth weight for gestation and VE followed by forceps (See Williams, et al). While Williams assumes acidosis is a separate factor, measured by umbilical cord pH, another researcher mentions acidosis developing during VE in 8 of 26 babies who later developed SGH.

- Scalp lacerations. This can be caused by a metal cup 'popping off' with a rotation.

- Cephalohematoma. This is quite a bit less serious than subgaleal hematoma but much more common, 8% in one study (Low, 135-7) Another researcher cites 16.7% of some type of bleeding such as cephalohematoma (Benaron, p 230).

- Subgaleal hematomas or subaponeurotic hematoma. This is rare but potentially fatal. Intracranial bleeding occurs and the blood, rather than staying in one area, accumulates in a space composed of loose connective

tissue between the periosteum of the calvarium (skull) and the galea aponeurotica. The subgaleal space extends from the orbital ridges around the eyes to the nape of the neck. There are no structures preventing the blood from moving throughout this space near the surface of the whole head. At a one cm depth, there is room in this space for all of the baby's blood. Once a bleed starts in this area, the amount of blood that can actually accumulate in extreme cases is 1/2 to all of the baby's blood. Mortality is 17-25% and happens with babies with extensive intracranial damage. CT scans can detect the amount of intraosseus bleeding but the first sign is cranium circumference increasing and "the presence of a mass straddling cranial sutures and/or fontanelles" (Govaert) or "baggy, ballotable craniums" and low hematocrit (Beneron, p. 231). These babies may be in distress at birth but many have normal apgar scores at birth but their heads gradually swell with the blood pooling there. This can begin minutes after birth up to several hours after birth. (Govaert) Babies born by VE are therefore usually monitored more closely than unassisted births, meaning they may be in the nursery rather than with the mom. If SGH is found, babies are sent to the NICU where treatment consists of restoration of blood volume, 40 ml/cm increase of head circumference (Govaert). Babies born prematurely by VE are more likely to experience this than term babies (Low).

- There is no question in the minds of most researchers that the primary cause of subgaleal hematoma (SGH) is VE. The only other consistently reported causes are clotting difficulties such as hemophilia or Vitamin K deficiency. The later can be prevented by administering Vitamin K to all babies born by VE (Govaert). The mortality rate for SGH is 17-25%. The incidence is up to 160/10,000 VE (1.6%) with metal cups and 50/10,000 (.5%) with pliable cups (Benaron).

  SGH is associated with use of VE in first stage, with rapid 2nd stage (under 30 min), with repeated applications of the cup, occiput posterior or occiput lateral head position, VE use more than 15 minutes, failed VE followed by foceps or CS, and forced delivery (Bernaron 230).

  SGH is more likely in fast second stage deliveries. Benaron postulates a reason for this:

  > The common pathway for vacuum-induced bleeding may be the rapid changes in the speed, magnitude, and direction of head compression and expansion, allowing no time for the blood vessels themselves to stretch and mold, leading to subsequent laceration (p. 230).

- Anemia secondary to subgaleal or other milder hematomas is treated with transfusion. Since this is a known complication of VE and a symptom of SGH, any babies delivered by VE will probably have more heel sticks for blood samples to test hematocrit.

- Increased mild neonatal jaundice 28% of VE births in one hospital but only 7% required phototherapy (Low, p 137).

- Cranial bone injuries. Suture diastasis (separating bone). Fissures, fractures and erosions of parietal bones have been seen on x-rays. Dehiscence (splitting apart) of adjacent bones is frequent especially parietal-occipital bones, confirmed by CT scans.

- Development of fetal acidosis This was documented to develop during VE in 8 of 26 babies who subsequently developed SGH (Govaert).

Instances of subgaleal hematoma and other scalp/head injuries were reported as early as 1957. It was thought that this would be lessened or eliminated by the use of pliable VE.

By 1994, however, medical journals began to publish papers on infant death and injury due to silicone VE. Two doctors who published a review of the literature in 1996 and reported six cases of subgaleal hematoma, 4 of which resulted had in death of the baby (Smith, Jett). By 1999 reports of infant injury and mortality due to VE began to reach the general public. Barbara Walters interviewed the Oregon doctors and parents of babies who had either died or been injured. One of the doctors reported in the interview that she found many physicians unaware of the dangers of VE (20/20 with Barbara Walters, January 29. 1999).

Injuries due to VE include (rarely) skull fracture and, more often, subgaleal hematoma. Subgaleal hematoma is when the subgaleal space of the head fills with blood. This space can hold between one half to all of the baby's blood once a bleed starts and is a life-threatening injury. Its occurrence except with VE is almost nonexistent. In some of these reported cases the VE had been started early in labor while the baby was still in high position, was used well past the 20 minute maximum guideline or was placed incorrectly, over the face.

The ACOG, recognizing potential misuse of VE issued the guideline that "progress in descent should accompany each traction attempt. As with forceps procedures, there should be a willingness to abandon attempts at vacuum extraction if satisfactory progress is not made." (*Birth Gazette*, Spring 1996:38)

Keys for the healing of adverse VE imprinting

There are four primary areas that I consider in the healing process for VE imprinting. The first two are true in working with families who have experienced any type of birth.

- The family system. The baby, mom, dad and siblings are all important.
- The present condition of the baby, mom and family. How strong are the baby and mom? What are the state of the baby and mom's resources and overall potency? Is the baby and mom still is in an acute state from the birth? Are they strong enough to move through the healing process?
- The sequence of the birth. In what order did the birth progress? What happened when? Where was the vacuum cup placed? Over how many contractions was the vacuum cup in place?

- Cranial molding from VE imprinting in my view is among the most complicated cranial dynamics possible. These babies need the assistance of a competent experienced craniosacral therapist.

Psychological tendencies in babies born via VE

Psychologically, these babies are often very compliant, not dissimilar to many CS-born babies. The VE-born babies I've seen narrow and confine their range of emotions and expressions to the most pleasing compensatory actions and emotions that the parents and primary providers reinforce. I began sessions with an eight to nine-month-old VE-born baby who had not yet started to crawl!! He adamantly avoided any posture or challenge that would stimulate his shock freeze terror with a sweet happy compliance that mesmerized his mother and father. His father is a chiropractor. His parents didn't suspect that he might be significantly developmentally delayed. In addition, both parents reported that they themselves started walking late. So, it appears that the VE imprinting further recapitulated this boy's ancestral trauma patterns.

Observations of VE birth cranial and biomechanical dynamics

Natural birth is a compressive process. Artificial externally applied traction forces do strange things to the body.

In your mind's eye, see the whole fluid membranous/cartilaginous perinatal cranium in the birth canal. Attach a vacuum extraction cup. Watch the fetal withdrawal contraction flight response pulling away from the VE. As the traction begins, the baby's power of flight is soon overwhelmed; the baby drops into a freeze dissociated shock. The operator is supposed to only apply traction with forward progress of the fetus. The traction forces create a powerful fulcrum, which shapes and molds the cranium in the direction of the VE drag. These forces pervade the whole cranium not just the parietal/occipital squama.

Placement
The VE cup is supposed to be placed over the posterior fontanelle, as close to the occiput as possible (Oxorn-Foote, 350). I have seen VE cups placed off the mid-sagittal line, on the mid-sagittal line at the posterior fontanelle, over the posterior mid-sagittal suture and right over the vertex (conception vessel). VE cups can be placed while the baby is high, mid or low (inlet dynamics late stage one, mid pelvis stage two or outlet stage three dynamics). However, ACOG 1990 recommends that the mother's cervix be fully dilated. This is in contrast to present forceps use guidelines, which restrict the use of forceps to outlet, stage three (ESC) placement.

Overlying traction vectors
It is medically recommended that the VE should not be used for more than 20 minutes. Oxorn-Foote's recommendation in 1986 was a maximum of 30-45 minutes. The current recommendation reflects more awareness of the dangers involved with prolonged use.

Remember that vacuum extraction causes a traction vector pattern in the cranial field. All natural forces in birth, are compressive. The vacuum traction imprinting is therefore contrary to the forces of nature. The site where the vacuum cup is placed becomes the primary fulcrum for the traction vector. It is recommended that traction be applied only with the forward movement of the baby during contractions. Even assuming that traction is applied no more often that during each contraction and no longer than 20 minutes, this means that traction is applied several times during the birth with the baby in different positions. Each time traction is applied, a new traction vector in overlaid on top of the preceding traction vectors.

Oxorn and Foote (p 352) list **four forces** applied to the fetal scalp. The first two are always part of VE. The second two are due to incorrect movement by the OB:

- Negative outward suction from the vacuum itself
- Force from the traction, ideally at right angles to the cup
- A circular force if rotation takes place. (This is if the OB does not follow the fetus) Oxorn notes: "Rotation of malpositions of the head should be allowed to take place spontaneously as traction is applied. Attempts to rotate the head by turning the cup leads to avulsion injuries."
- A shearing force occurs when the direction of traction is not perpendicular to the surface of the scalp. (This is not part of the recommended procedure but does happen when the cup is 'rocked' or not at the proper angle.)

Application of VE more than once
These forces will be further complicated if the VE cup is used, then removed and reapplied, possibly to a different part of the head. This can happen for at least three reasons:

- Malposition and deliberate removal: One reason for this is that the cup can be placed so that it inadvertently 'catches' the vaginal wall or the cervix injuring the mother and necessitating reapplication. The OB is supposed to manually check to avoid this but mistakes occur. This happened to a BEBA mom whose story is told later.
- Popping off due to applying traction before there is sufficient negative pressure. Oxorn-Foote, who wrote only about metal VE (p 352) warns: "When insufficient time is allowed for the development of the caput within the cup, there is the risk of the cup's 'popping off.' This accident causes tearing of the fetal scalp and should be avoided." The scalp tearing is associated much more with metal cups than with the silicone cups (Loghis).
- Popping off due to malposition or to higher traction pressures than the cup can sustain. Metal cups sustain 30% higher traction pressure than silicone. One of the main problems with the silicone cup is its tendency to pop off, especially lower in the pelvis.

Use with Cesarean sections

- A 'failed' attempt at vaginal delivery using VE or forceps may be followed by a cesarean section.
- During a cesarean section, the head may be dislodged by the use of VE. This can be done either to allow a smaller incision than is needed to reach in with hands or because the baby's head is lodged deep in the pelvis and the OB is having difficulty extracting it. In this case a soft cup is preferred to metal because it can be easily folded to insert, because the time to get to the proper negative pressure significantly shorter (8 seconds), and because it can adapt to any head shape, including one with a caput (Pelosi).

Use with forceps

- A 'failed' VE may be followed by forceps. Sometimes the VE helps pull the baby down far enough that it is then possible to use forceps.
- A 'failed' forceps may be followed by vacuum extraction. In one hospital all 10 of 186 (5% of VE attempts) of these were the result of a transverse or posterior occiput (Low, p 136).

Cranial molding
Cranial molding and lesion patterns from VE are among the most complicated the trained craniosacral practitioner will ever encounter because of the traction vector dynamics. The whole body carries the VE imprint as does the whole cranium. However, as far as I can tell, the key for the VE cranial lesion patterns are to be found in two places. One is in the ventricular spaces, especially of the third and forth ventricles. The other is in the intraosseous lesion patterns within each bone of the cranial base and the vault. The most obvious lesion patterns are often the most traumatic pattern in the sequence or the last to be imprinted. In tracking the baby I've found that it is important to let the baby and the parent unfold the sequence and for them to determine which aspect of the pattern they work on.

The placement of the VE cup, the mother's pelvic shape, the power, frequency and quality of the birth contractions combine to influence the baby's cranial molding, movement and postural dynamics. If the placement of the VE is off center, the cranial torsion, cranial sidebend patterns, and the body counterparts of "C" curves, over-rotation of the baby's torso and pelvis torsion are more amplified.

Accompanying interventions
Often the VE is preceded by artificial rupture of the membranes (amniotomy), Pitocin or artificial oxytocin, which imprint and influence the quality of the baby's movements. If the Pitocin drip is titrated, short choppy movements in the baby are characteristic. Episiotomy is less often employed. (There is some literature from the mid 1990's indicating that VEs were associated with fewer episiotomies.) If moms were given spinal or epidural anesthesia, their babies routinely have difficulty getting their energy and forward driving power into their legs. These babies will often have difficulty when they begin crawling backwards to actually get themselves to go forward. Their upper bodies do not coordinate well with their lower bodies.

Effects of unnatural traction
In prenates and babies who are free of the unnatural traction forces, there is a natural attraction of the attention via the senses and innate curiosity to move out toward the physical universe. From the Polarity Paradigm this inside to outside movement is a centrifugal force. These energetic lines of force appear to elongate and expand babies' physical bodies. These natural elongative forces are seen especially in preparatory and stretching movements of babies and come from within the baby.

The forces of externally applied traction from any source, hands, forceps or VE are totally foreign to the collective innate human ancestral birth memory. The externally applied traction forces overlay, overwhelm and confuse the baby's consciousness. The most frequent outcome is varying levels of shock imprinting and lifelong confusion between push and pull, with the person finally submitting to the outside forces.

By saying all this, I am not negating the fact that sometimes forceps and VEs are lifesaving. However, every one of these babies needs follow-up birth trauma resolution care.

In a correspondence Franklin Sills stated:

> Indeed I have noted similar things about VE—note that the cerebrospinal fluid dynamics are severely compromised yielding a listlessness and tendencies to exhaustion syndromes. The dynamics of the ventricles are compromised and the homeostatic balance of the pituitary and pineal glands upset — the third ventricle and aqueduct of Sylvius are important—it sometimes feels like the aqueduct has been pulled superior (of course it would as the hindbrain is pulled superior) and the flow/fluctuation of CSF is compromised—the energetics of the system are thus compromised —third ventricle energetic dynamics are important along with severe (as you pointed out) shock and hindbrain shock and charge.

Case study of a girl born by VE with cranial biomechanical analysis

Dr. Wendy McCarty and I worked with a baby girl born via VE. She was three weeks old weeks old when we began with her. She was born June 23, 1995. We completed 38 sessions with her and her family. Her mother came to all of the visits. Her father missed several visits due to work. Her mother and father are primary partners and are not married.

This baby girl was conceived in mid-September 1994. The mother was very aware of the conception. Two weeks after the conception, the mother's grandmother, the baby's great grandmother, was diagnosed with Alzheimer's disease. The great grandmother died two weeks before the baby's birth. The mom was sexually abused by her stepfather (her mother's 3rd husband) from the ages of 5 to 7 years old. The mom's mother was and is an active alcoholic. This family consciously eats a balanced organic vegetarian diet. The baby was breastfed throughout the facilitation period, well past her 1st birthday.

The mom was born under general anesthesia and forceps in the mid-sixties. The father was born also in the mid-sixties, vaginally in an unmedicated non-technological birth. He was well respected, loved and nurtured by his family. In our sessions together, we developed a joke saying that the dad is "trauma deprived" compared to this baby's mom because the possibility for trauma did not appear to be in his comprehension.

During the pregnancy and birth, the mom reported that she felt invalidated three times by her midwives. She did not realize that this had happened at the time, nor did her midwife pick up her feeling of being invalidated. If fact, the mom's sense of invalidation was first addressed during one of the family sessions she had with us.

Baby and mom began labor at home with the intention to birth there with a midwife. In pre-labor through the beginning of labor this little girl had progressed to zero station and became stuck in her right-sided lie cranial transverse position. Her mom had dilated to 9 cm. They transported to the hospital after 40 hours of labor.

Mom reported that when they got to the hospital she was treated roughly by the OB. His exam technique was not like the gentle respectful exams she received from the midwife. She said she felt "punished and raped" by the OB (a recapitulation of previous sexual abuse). From here the story gets worse.

What we see from the baby's movement patterns, the first contact with the OB, especially the first exam, sets up and imprints a counter-torsion reaction pattern. The baby was a right-sided lie (RSL). She therefore has as RSL C curve in the AP view of her torso. From the baby's point of view, she would experience the OB's mental state and feel her mom's reaction. Mom wants to flee (fight or flight adrenal state) but can't. So, the baby inside activates her flight reactions and contracts away from the direction the OB is doing the exam. The flight reaction is a heightened adrenal charged state and a motor reaction in the baby. She contracted into her C curve on the right. This activates the sternocleidomastoid (SCM) muscle on the right more than on the left. Remember that the right SCM rotates the head to the left. So as she compresses into the right C

pattern, she also turns her head to the left. As her head turns to the left, her upper body follows to the left, her non-lie side. The lower torso then counter-torsions toward the right, her lie-side.

So, the counter-torsion is a flight motor contraction to the lie side,

- which causes the lie side SCM to contract,
- which turns the head and neck to the left,
- which causes the upper body to turn in the direction of the head and the lower body to rotate in the opposite direction toward the right.

The baby's head moved into an oblique occipital posterior position amplifying the counter-torsion pattern in her torso and with her face rotating across the mom's pubic symphysis. Later, she actually fully rotated to a LOT, left-sided lie position.

The reason the baby was unable to progress past zero station is because mom's perineal floor was splinted. Her perineal musculature was very hard. The baby's head was moderately small. Mom's pelvis is either android or gynecoid. The baby had ample room to turn her head but did not progress past zero station.

As the OB attempted to apply the suction cup, the baby recapitulated the same pattern again. The OB, who was apparently not aware of the baby's compression counter-torsion pattern, attempted to apply the cup while she is in the transverse position and in the contraction movement pattern. The baby at this point did a full rotation. Unfortunately as he applied the cup he also caught part of mom's vaginal wall. As the VE suction was turned on and traction applied, mom experienced a major internal tear. She began to bleed profusely. The mom later needed three units of blood. The VE cup dislodged. They have to re-apply the cup a second time. It is interesting to note that mom reported afterwards that she thought they had to apply the cup 3 or 4 times. This baby girl who began as a right-sided lie was born a left-sided lie (LOT).

This baby was then born stage three in rapid fashion after the second application of the VE cup in a left-sided flexed transverse position. This pattern matches one of the android birthing patterns (without the VE) as described by Caldwell and Malloy. However, I am not fully sure of the mom's pelvic shape.

As a general rule, vaginal exams and the application of internal devises (pressure catheters and electronic scalp monitors) occur under duress. Active alert, fight or fight stress levels imprint and recapitulate the compression reaction pattern several times.

I believe that by the time the VE cup was applied to this baby a second time, she was out of her flight reaction and probably in some degree of shock. Her body would then have gone into a freeze state further locking in the counter-torsion pattern. She then progressed to a deeper state of shock and her body went hypotonic. By the time they applied the VE cup the second time and began to apply the traction to extract (birth) her, it appears that she was in a shock hypotonic state.

There is one other component to her body posture that was also imprinted. Her head position was in flexion at the neck. So, her body's C compression to the right, head

rotation to the right and counter-torsion of the torso is accompanied by cervical flexion and torso flexion.

Her cranium has two sets of VE traction vector patterns, one in flight reaction the other in hypotonic shock affect. She has a host of cranial intraosseous and interosseous patterns. The occipital squamous was tractioned out into extension compressing the squamous condylar junctions. The SBJ has a traction strain, torsion and sidebend. The left orbit is smaller and retracted compared to the right exhibiting torsion through the transverse axis of the sphenoid bone. The SBJ also has an inferior strain pattern. And, the VE traction pattern extends into the core of the CNS, 3rd and 4th ventricles, compressing the aqueduct of Sylvius and tractioning the brain stem. The brainstem also demonstrates the left rotation torsion pattern from her compression reaction and birth.

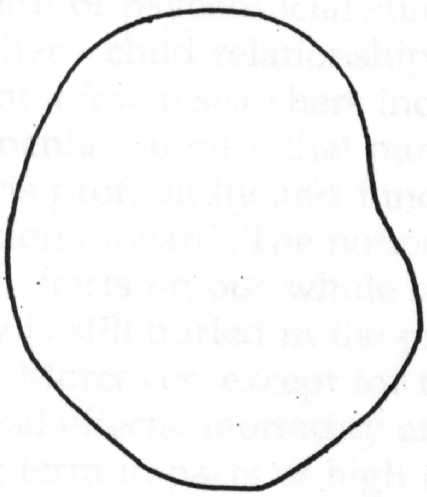
Attention should be given to this baby's occipital and temporal bone relationships. If we look at her right occipital condylar portion is externally rotated and anteriorly inferior. I would have expected her right temporal bone to also be externally rotated. Surprisingly her right temporal bone appears internally rotated. This pattern carries with it a significant parietal bulge at the parietal eminence.

In contrast, her left occipital condylar portion appears internally rotated, opposite her right occipital condylar portion. Again, if I look at this condylar internal rotation I would expect the temporal bone to follow with internal rotation. Instead, the left temporal bone is externally rotated. Her left occipital squamous, parietal eminence and temporal squamous was flattened and compressed.

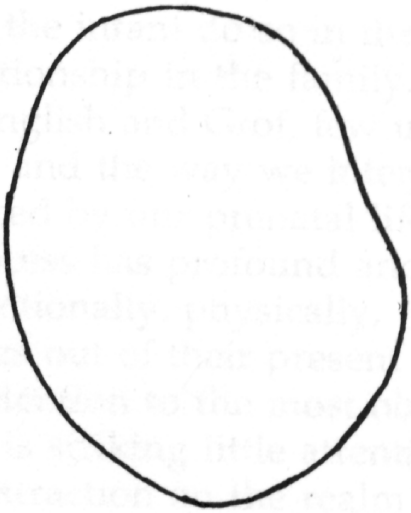
I think the compression that caused this flat area plus the counter torsion stain pattern caused these relationships of the occipital condyles and the temporal bones bilaterally.

As of April 1999, this girl is almost 4 years old. She began standing and balancing at 8 -9 months. By April of 1996 she was walking. She is very clear emotionally and present. Both her mother and father have grown a great deal from the work. The baby's cranial molding is significantly improved though not fully resolved. My sense is that this baby's unresolved cranial molding is coupled to unresolved ancestral imprinting that she has yet tap into. I have seen with other cases that when the parents do their own work that baby is freed to experience a new level of resolution structurally and psychologically.

Below are comparison tracings of this baby's cranium of a video image looking from the top down. Unfortunately, we do not have adequate shots of her head from this view (a vertex view) from more recent months.



7/25/95 1MO



10/10/95 3½MO

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