

CRANIAL AND STRUCTURAL EVALUATION OF NEWBORNS:
A Review of 54 Infants and Correlation of Structural
Findings to the Mechanisms of Delivery

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April 28, 1987

INTRODUCTION

All the infants born at the Waterville Osteopathic Hospital receive a routine cranial and structural evaluation and treatment. A review of 54 newborn evaluations was conducted to correlate delivery with structural findings. The effects of labor and delivery on infant skulls have been well documented (1, 7) as well as the effects of forceps (9) and other various forces on the newborn child. It is reasonable to assume that maximum brain growth can only be attained if the infant skull is flexible and symmetrical (1). Early treatment of anomalies of structure may enhance brain and central nervous system function and therefore prevent various learning disabilities (5).

There has been extensive work done to document structural patterns common at birth and the mechanisms of their attainment (6). Occipital strains are implicated in nervous symptoms; specifically vomiting, hyperactive peristalsis, tremor, hypertonicity and irritability. Flexion at the sphenobasilar symphysis with extension of the sacrum was also found among nervous infants, as was compression of the sphenobasilar symphysis. Torsion strains at the SBS and restrictions in temporal mobility were correlated with respiratory and circulatory problems. Viola Frymann's work was done with 1250 infants and published in 1966. It is interesting to note that only 6% of those were delivered with either no anesthetic, local pudendal block, or ether whiffs with contractions. Twenty-seven percent received inhalation anesthetic Trilene or ether and 67% received spinals. Sixty-three percent were via forceps delivery, 33% spontaneous and 4% by C-section (6).

EXAMINATION OF NEWBORN INFANTS

The newborns at Waterville Osteopathic Hospital are examined as usual by their attending physicians. In addition, they are examined structurally prior to their discharge. The following criteria are assessed:

1. Overall quality of CRI (craniorhythmic impulse)
2. Relative CRI between cranium, sacrum and synchronicity
3. Dural Tube unwinding
4. Hip clicks
5. Sacroiliac restrictions
6. Restrictions to extension of thoracic and lumbar spines
7. Chest wall flexibility
8. Suture overlap
9. Quality of anterior fontanel--size and relative flexibility

10. Sphenobasilar compression
11. Occipito atlanto compression
12. Facial torsion

Most of the above terms are self-explanatory. Dural tube unwinding involves suspending the newborn in the examiner's hands by supporting the occiput and sacrum and allowing it to assume a position of ease. The pattern is then followed as in most fascial unwinding procedures, i.e., back to a neutral position. Most infants at that point exhibit a symmetrical expansion/contraction of the dural tube. The infants are then treated utilizing fascial unwinding and articulatory techniques in the spine and sacroiliac; and suture spreading and decompression techniques in the cranium.

There follows a breakdown of the 54 infants examined. First, the infants were divided into two groups according to delivery—assisted vs. vaginal. Assisted deliveries were defined as those requiring mechanical intervention, i.e., Cesarean sections, vacuum extraction or forceps. Vaginal deliveries were those infants that delivered vaginally without mechanical assistance. Each group was then divided into two subgroups—normal and abnormal structural exams. An infant with a normal structural exam had minimal, easily treated somatic dysfunctions, usually of only one or two areas, without marked or severe SBS compression or marked decrease in CRI. A structural evaluation was defined as abnormal when the infant had multiple areas of somatic dysfunction, marked compression of any area or marked decrease in CRI.

RESULTS

Of the 54 infants, 19 were assisted deliveries (35% of the total). Of those, six of the infants examined had normal structural evaluations, with only minimal, easily treated somatic dysfunction. Average weight was 7 lbs. 6 ozs. Five were female and one was male. These comprise 31.5% of the assisted deliveries. Thirteen were considered to have abnormal structural evaluations (68.5% of the assisted deliveries), 24% of the total. Average weight was 7 lbs. 14 ozs. Seven were female, six were male. Of the abnormal structural evaluations, 10 (76%) showed decreased cranial rhythmic impulses and 10 (76%) compressed sphenobasilar symphyses. These were the predominant findings. There was a variety of other findings including force vectors, tubal unwindings in extreme positions—flexion or extension, occipito-atlanto compression and restrictions in the thoracic and lumbar spines.

There were 35 vaginal deliveries, 65% of the total, of which 17 (48.5%) of the infants had structural exams which were considered normal. Average weight was 7 lbs. 9 ozs. Eight were female and nine were male, and the average length of the second stage of labor was 36.8 minutes. Eighteen (51.5%) of the vaginal deliveries were infants with structural exams considered to be abnormal. Average weight was 7 lbs. 7 ozs., of those whose weights were recorded. Nine were female and eight were male, of those with recorded sex. The average length of the second stage of labor was 27.3 minutes (two of the 18 had no recorded length of the second stage of labor). Of the 18, 12 (66.7%) had sphenobasilar

symphysis compression, 11 (61%) had decreased craniorhythmic impulse and 14 (77.8%) had some sort of major somatic dysfunction of the thoracic or lumbar spine or unusual tubal unwinding. There were also many other findings including suture over lap, molding, occipito-atlanto compression, torsion of the sphenobasilar symphysis and parieto-temporal compression, but the above were the predominant findings.

TABLE 1

EXAMINATIONS

		Normal	Abnormal
DELIVERIES	Assisted: 19	6 (31.5%)	13 (68.5%)
	Vaginal: 35	17 (48.5%)	18 (51.5%)

TABLE 2

Major Structural Abnormalities As They Correlate With Mechanism of Delivery

	Sphenobasilar Symphysis Compression	Decreased CRI	Abnormal Somas
ABNORMAL Assisted: 13	10 (76%)	10 (76%)	—
ABNORMAL Vaginal: 18	12 (66.7%)	11 (61%)	14 (77.8%)

DISCUSSION

Of the 54 infants examined here, those in the assisted group were delivered from mothers who had received either spinal or general anesthesia. The vaginal deliveries were all performed with only local anesthesia. The infants born via assisted deliveries had more abnormal structural exams than infants born via vaginal deliveries (68.5% versus 51.5%). It seems that a routine vaginal delivery can almost be likened to a natural unwinding process and that the assisted deliveries interrupt this process. Of the infants born vaginally, the ones with normal structural exams had an average length of the second stage labor of 36.8 minutes, with a range of between five and 110 minutes. The infants with abnormal structural exams had an average length of the second stage of labor of 27.3 minutes with a range of 3 to 94 minutes. Although the number of structural evaluations in this study is limited, there appears to be an overall correlation between abnormal

structural findings and shorter second stages of labor. In fact, 9 of the 16 abnormal structural exams, with recorded lengths of the active phase of labor, were less than 20 minutes whereas only five of the 17 with normal structural exams had active phases less than 20 minutes. It may be that a precipitous passage through the active phase of labor contributes to abnormalities of structure.

TABLE 3
Average Length of Second
Stage of Labor

	Abnormal Vaginal Deliveries	Normal Vaginal Deliveries
	18	17
	27.3 minutes	36.8 minutes
Abnormal Vaginal Deliveries	Range 3-94	Range 5-110
	No. less than 20 min.: 9	No. less than 20 min.: 5

It is clear that the birth process is by and large a normal one and that at least half of the infants born vaginally are able to cope with the structural stresses placed on them. Apparently half have more significant structural changes that may or may not be resolved without the aid of osteopathic manipulative therapy. The long term effects of manipulative intervention this early in life are not clear, but no adverse effects have yet been identified.

Intervention in the birth process does appear to have some structural effects on neonates with more of those having significant structural changes than not. These infants may benefit from manipulative treatment even more than those born vaginally. Subjectively, the infants all seem to be very content following treatment, and many appear to be less fussy, suck better and show overall improvements in breathing and color. Nursing staff at the Waterville Osteopathic Hospital will attest to that as well and frequently request treatment for the babies on an urgent basis in the infants that are more fussy than normal. continued evaluation of newborns and correlation with both symptomatology and mechanism of birth will be beneficial to the routine care of newborns.