

# Osteopathic Treatment for Somatic Dysfunction in Infants After Birth

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Osteopathy refers to three basic principles. 1) The body is a unit, wherein all systems aim to work together to function effectively. If there is dysfunction in one area of the body, this change impacts other regions of the body as it attempts to compensate for the dysfunction. 2) The body has its own self-regulating mechanisms that promote self-healing and physiological balance if the body is functioning efficiently. 3) Structure and function are reciprocally interrelated. When in their optimal states they promote health; however, if there is a derangement in the anatomical structure it will impact the optimal physiological functioning of the body. And reciprocally, suboptimal physiological functioning in the body can lead to alteration in anatomy. A manual osteopath, governed by these principles, attempts to identify alterations in structure and/or function in a body, help restore or maintain homeostasis through manual techniques and a holistic approach that addresses the body, mind and spirit of a person.

Somatic dysfunction can be defined as the “impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodiarthral, and myofascial structures and related vascular, lymphatic and neural elements” (Ward 2003). Physiological dysfunction can occur when a stressor impacts a structure and causes a restriction of mobility within the limits of normal range of movement. These stressors can occur prenatally, during the birth process, or afterwards at any given time (Sergueef 2007). For the purposes of this paper, dysfunction resulting from potential prenatal and/or birthing stressors will be reviewed along with manual osteopathic treatment options.

Multiple intrauterine factors can constrain a fetus in a dysfunctional position that limits movement such as uterine fibroids, lack or excess of amniotic fluid or multi-fetal pregnancy. Limitation of movement can cause fascial tension strains for the fetus and potential compression of their bones and internal structures while pressed against maternal bone structures. As well, maternal viscera can impact the fetal lie during gestation and her pelvic structure and sacrum positioning affects the fetal presentation. Asynclitism, where the fetal head is no longer in line with the birth canal, can cause a more difficult birthing process. Fetal tissue is usually very adaptive to the pressures of uterine contractions, however there are times when it does not adapt well under these conditions, especially if malpositioned (Sergueef 2007).

Asynclitism can increase the potential for cranial dysfunction due to greater pressure to one side of the fetal skullcap. As well, if there is failure to progress with the fetal descent after engagement there can be compression forces along the fetal spine to the cranial base during contractions, as the head meets resistance from the maternal pelvis. A myriad of other potential cranial dysfunctions can occur depending on the fetal area being compressed including frontal bone, sphenobasilar joint, craniocervical junction and occipito-atlantal joint to name a few. Sergueef highlights the potential for future axial skeletal disorders such as plagiocephaly or scoliosis due to asymmetric dysfunctions when one part of the occiput is compressed because the head extension does not usually occur in the sagittal plane, but instead with some degree of rotation and sidebending (Sergueef 2007).

Further facial skeletal dysfunction can occur during extension of the occiput, as the forehead, nose, mouth and chin are compressed inferiorly, and these dysfunctions would also be asymmetrical. “The shoulders usually enter the pelvic inlet in the oblique diameter opposite to

the one in which the head entered. Therefore, during delivery, the global motion of the body follows a dynamic spiral. There is a limit to the resilience of the fetal tissues, however, and during the process of producing the external rotation this limit may be exceeded. As a consequence, dysfunction that develops during this period may result in the establishment of a torsional pattern between the pectoral and pelvic girdles. This is a global pattern involving the whole body – fascia, membranes, muscles and joints included.” (Sergueef 2007)

Somatic dysfunctions from a breech presentation sometimes include the hip, pelvic bone, sacrum or lumbar spine due to the fetal trunk side bend that occurs before the hips are delivered. And dysfunction to the facial skeleton from pressure of the anterior surface of the maternal sacrum and coccyx during a breech delivery can also occur. With some face presentations, vaginal delivery is not possible and caesarean section ensues. For those facial presentations that can proceed vaginally, there will be hyperextension of the fetal cervical spine and significant molding of the fetal skull, with concomitant facial swelling and potential cervical spine dysfunction. Shoulder dystocia complicates delivery when the anterior fetal shoulder is stuck up against the maternal pubic bones and requires maternal or fetal manoeuvres to successfully deliver the shoulders and the resultant forces can cause brachial plexus injury or clavical fracture and potentiate somatic dysfunction of the ribs, pectoral girdle and cervicothoracic junction (Sergueef 2007).

Obstetrical birth interventions have also been implicated in somatic dysfunction. Forceps assisted deliveries include risk for facial nerve palsy, skull fractures and intracranial hemorrhage and potential cranial bone and/or cranial nerve dysfunctions due to the compression and traction forces of the forceps blades during delivery of the head. Vacuum assisted deliveries increase the risk of subarachnoid hemorrhage and cephalohematoma. Extracting forces can cause asymmetrical pattern in the parietal bones and stretching of the cranial membranes potentiating cranial and spinal dysfunctions (Sergueef 2007). Forceps, vacuum and increased traction or rotational forces may also be required during a caesarean section delivery, with similar potential somatic dysfunction sequelae to follow.

Literature searches provide limited available research on manual osteopathic therapy with infants generally, but what is published highlights positive results especially for cranial osteopathic techniques. Hayden and Mullinger (2006) assert that osteopathic treatment may help alleviate the physical and biomechanical influences of childbirth. Their controlled, prospective study on infants with colic showed statistically significant improvements in colic behaviors and sleep for the randomized treatment group compared to the control. They applied manual techniques to the cranium as well as any other areas of increased ligamentous/muscular tone or decreased/abnormal articular mobility based on their osteopathic assessments.

Philippi et al., (2006) completed a randomized clinical trial on infants with postural asymmetry (mainly congenital torticollis, idiopathic infantile scoliosis or plagiocephaly). They assessed the skull, sacrum, iliac and coccygeal bones, thorax, sternum, diaphragm and abdomen of the infants in their treatment group and performed osteopathic techniques as deemed appropriate for these areas dependant on their assessment findings. There was a statistically significant improvement in postural asymmetry in the treatment group.

Lessard, Gagnon and Trottier (2011) also did a pilot project on the effect of osteopathic treatment for cranial asymmetries associated with nonsynostotic plagiocephaly in infants. The authors remind us that the fetal cranial bones are meant to be able to override to accommodate passage through the birth canal but that mechanical strains may cause flattening of the occiput. The osteopathic treatment goals here aim to optimize alignment and mobility to improve physiological function and homeostasis. The research consisted of providing four osteopathic treatments to infants with nonsynostotic plagiocephaly. While no definitive conclusions could be drawn due to small sample size (12 infants) and no control group, there were statistically significant improvements found in the measurements of all three indices measured to assess cranial asymmetries and the study provides a standardized protocol that could be used for larger scale randomized controlled trials.

Fucile et al. (2011) provided oral and nonoral sensorimotor interventions to preterm infants with suck-swallow-respiration dysfunction. While the article does not discuss the techniques as specific to osteopathy, the perioral, intraoral and full-body soft tissue and range of motion techniques employed would fall within the scope of manual osteopathy. The infants were randomly assigned to the oral group, the tactile/kinesthetic group or combined group. All three groups resulted in improved swallow-respiration coordination, and the oral group had statistically significant improvement in nutritive suck function.

Herzhaft-Le Roy, Xhignesse and Gaboury (2017) completed a randomized control trial where osteopathic treatment was coupled with lactation consulting to assess an infant's ability to latch at breast for those who had biomechanical sucking dysfunctions. Both groups received support from lactation consultants and osteopathic assessments, and one group received osteopathic treatment (most commonly balanced membranous tension, cranial suture and myofascial release) while the other received a sham treatment (light touch far from the osteopathic dysfunctions assessed). Interestingly, all infants had cranial dysfunction with 97.9% having occipital dysfunction. Even with just one manual osteopathic treatment, statistically significant improvements were found in scoring the latch at breast. Statistically significant results found for decreasing maternal nipple pain were observed initially but did not last over time. The authors hypothesize that earlier osteopathic treatment before the infant has time to create compensatory feeding behaviors, an additional infant osteopathic treatment to support rebalancing structures and additional lactation consultations could improve these results.

Lund et al., (2011) published a case report of twin girls born premature at 25 6/7 weeks gestation who had multiple complications, but whom still could not achieve full oral feeding by 41 2/7 weeks gestational age in order to be discharged from the neonatal intensive care unit. In an attempt to avoid potential surgical placement of gastroscopy tubes, the twins were evaluated and treated daily using osteopathic manipulative treatment based on the assessment of the practitioner. Treatment included soft tissue, balanced ligamentous tension, myofascial release, inhibition pressure and cranial osteopathy. Within 20 days from the start of treatment the twins were able to achieve full oral feedings and be discharged home. Of note, before the treatments twin A was only receiving 16.1% of feeds orally and twin B 37% and had had exhibited a lack of improvement in nipple (breast and bottle) feedings. The case studies do not prove that the

osteopathic treatments were responsible for the improved feeding, but given the results is a plausible explanation that lays the ground for future organized research studies.

The ability for a newborn to feed effectively is imperative. Smith (2007) reminds us that a “newborn uses 6 out of 12 cranial nerves, 22 bones connecting at 34 sutures, and 60 voluntary and involuntary muscles to suck, swallow and breathe properly. [And that] this process occurs at 40 to 60 cycles per minute, 10 to 30 minutes at a stretch, and 8 to 16 times a day or more”. As mentioned above, prenatal fetal lie, and labor and birth forces and interventions may impact the musculoskeletal and nervous systems for the infant. Smith further postulates that if an otherwise normal infant is not able to latch and maintain breastfeeding (which they should innately be able to do) that there may be an internal disruption of the bones and/or nerves involved in this dysfunction.

Pizzolorusso et al., (2013) did not perform osteopathic treatments in their research, but used osteopathic assessment to determine the prevalence of somatic dysfunction and craniosacral strain pattern in preterm and term infants. Out of 151 infants who met the study criteria, 40.7% had pelvic dysfunction, 52.9% had sacroiliac joint compression, 39.4% had lumbosacral junction restrictions, 36.8% had intraosseous lesions of the sacral bone, 18.7% middle thoracic restrictions, 16.8% lower thoracic restrictions, 36.8% had sphenobasilar synchondrosis compression and lateral-vertical strain, 22.6% sagittal and 19.4% coronal suture restrictions, and intraosseous lesions of the occiput showed 31% with left condyle compression, 29.7% with the right condyle and 24.5% had squama part of the occiput compressed. If structure governs function and if dysfunction in one part of the body affects other parts of the body, this research shows just how many infants could benefit from osteopathic manual therapy to promote optimal functioning for those who are symptomatic and help prevent subsequent dysfunctional mechanisms from arising regardless of whether they are currently symptomatic.

Somatic dysfunctions that are noted after birth, if left untreated, can contribute to ongoing dysfunction that can persist throughout the lifespan. Infancy presents an ideal time for treatment as the sutures are not fused and the bones not completely ossified yet. In understanding normal anatomy and physiology and having the ability to assess dysfunction and treat it, manual osteopaths have valuable skills to offer to this vulnerable population of infants for positive long-term outcomes.

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