Treatment of Newborns with Congenital Torticollis and/or dysplasia of the hip Through Osteopathy

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Aim for the workshop

• Obtain a common set of definitions of the conditions
• Get an overview of related research in the field
• Get a repetition of anatomy of the newborn hip and neck
• Become more aware of the diagnostic process
• Improve treating skills in the related areas
• Discuss the importance of interprofessional collaboration around the treated children
Hipdysplasia

• The term congenital dislocation of the hip dates back to the time of Hippocrates. This condition, also known as hip dysplasia or developmental dysplasia of the hip (DDH), has been diagnosed and treated for several hundred years. Most notably, Ortolani, an Italian pediatrician in the early 1900s, evaluated, diagnosed, and began treating hip dysplasia (1)

• Since then, significant progress has been made in the evaluation and treatment of DDH (2,3,4,5,)
Hipdysplasia - definition

- Developmental dysplasia of the hip comprises a spectrum of abnormalities, ranging from laxity of the joint and mild subluxation to fixed dislocation (3)
• Developmental dysplasia of the hip (DDH) affects 1.5 of every 1,000 caucasian Americans and less frequently affects African Americans.

• Early diagnosis of DDH usually leads to low-risk treatment with a harness. Late diagnosis of DDH in children may lead to increased surgical intervention and complications. (3)
• For infants with a positive hip instability exam, there is conflicting evidence about whether a period of observation or immediate brace treatment leads to a difference in later dysplasia or persistent hip instability leading to later brace treatment (8)
Under three months

• The Ortolani and Barlow tests are the most common clinical tests for newborn babies: In the
  • **Ortolani test**, the examiner applies forward pressure to each femoral head in turn, in an attempt to move a posteriorly dislocated femoral head forwards into the acetabulum. Palpable movement suggests that the hip is dislocated or subluxed, but reducible.
  • **In the Barlow test**, backward pressure is applied to the head of each femur in turn, and a subluxable hip is suspected on the basis of palpable partial or complete displacement. (7)
- Benign hip clicks, resulting from soft tissues snapping over bony prominences during hip movement, should be distinguished from the clunks produced during the Ortolani manoeuvre as the dislocated femoral head is reduced and from the subluxation felt during the Barlow test. (7)
Limited hip abduction

• Both the Barlow and Ortolani tests detect an unstable hip but do not detect a dislocated, irreducible hip, which is best detected by identifying limited abduction of the flexed hip) or a stable hip with abnormal anatomy - eg, acetabular dysplasia
Children aged 3 to 6 months

- If the hip is dislocated it is in a fixed position.
- The **Galeazzi** sign:
  - Unilateral femoral shortening may signify hip dislocation or rarer abnormalities of the femur.
  - False negative results may occur with bilateral hip dysplasia or when the pelvis is not level.
  - A positive sign is that one leg appears shorter than the other.
  - This is usually due to dislocation of the hip; however, any discrepancy of limb length will produce a positive sign.
Bilateral dislocation of the hip

• DDH is bilateral in about 20% of cases. (7)
• It can be quite difficult to diagnose, especially after the neonatal period.
• There is often a waddling gait with hyperlordosis.

• **The Galeazzi sign** for hip shortening is often absent, as are asymmetrical thigh and skin folds, or asymmetrically decreased abduction.
• Careful examination is needed with a high level of suspicion.
Most important sign

- Stable hips may be dysplastic. Limited hip abduction (less than 60°) when the hip is flexed to 90° is the most important sign of a dislocated or dysplastic hip (7)
Other signs for late dislocation (7)

- Asymmetry of the gluteal thigh
- Assymetry of labral skin folds
- discrepancy in leg length
- Widened perineum on the affected side
- Buttock flattening
- Asymmetrical thigh skin folds decreased abduction on the affected side
- Standing or walking with external rotation of the affected leg
• Clinical evaluation for DDH should be performed periodically at each well-baby visit until the age of 12 months. Consideration for screening with ultrasound is balanced between the benefits of early detection of DDH and the increased treatment and cost factors.

• In the United States, hip ultrasound is selectively performed in infants with risk factors, such as family history of DDH, breech presentation, and inconclusive findings on physical examination (3).
Risk factors

- Some studies confirm significance for selective prospective screening by ultrasound in infants with history of possible clinical instability and/or risk factors; breech and family history to prevent late dislocations and need for surgery (14,15)

- Vaginal delivery of babies with breech presentation is associated with a 17-fold increased risk of hip dysplasia; there is a 7-fold increase for breech babies delivered by elective caesarean section. Restriction of movement as with oligohydramnios increases the risk. (7)

- Some studies also show no statistical significance for family history (16)

- Evidence are not found to include foot abnormalities, gender, oligohydromnios and torticollis as risk factors for DDH (8)
• From a total of 49240 children we found 576 abnormalities:
  • 326 dislocations
  • 250 abnormally lax hips
• On babies examined on the first day of birth there is an incidence of 1 in 40.
• Those examined when seven days old have an incidence rate of 1 in 100.
• Spontaneous recovery during the first week of 60% (6)
von Rosen splint, Pavlik, Craig, or Frejka splints?

- There are no high quality comparative effectiveness studies between different types of braces for the treatment of DDH. (8)
• For infants with a positive hip instability exam, there is conflicting evidence about whether a period of observation or immediate brace treatment leads to a difference in later dysplasia or persistent hip instability leading to later brace treatment. (9,10,11,12,13)
• There is considerable confusion related to the terminology and definitions that have been used in research related to DDH and about what defines a pathologic condition versus an expected developmental variation based upon the age and status of a child is needed (8)
Guideline

• An evidence-based clinical practice Guideline about "DETECTION AND NONOPERATIVE MANAGEMENT OF PEDIATRIC DDH IN INFANTS UP TO 6 MONTHS" was adopted by the American Academy of Orthopaedic Surgeons Board Directors and endorsed by these organizations:
They found:

- (Out of 39990 citations
- 42 articles were included)
- ..significants gap in the evidence to be used for a guideline
- ..considerable confusion in the terminology related to DDH
- ..gaps in knowledge about pathophysiology of DDH
- ..gaps in the optimal diagnostic tools to be used to detect the condition
- ..relative efficacy and value of recommended interventions
For future research they hope for:

• A research design that is applicable to routine practice situations and allow for comparison of alternative methods of diagnosis and treatment.
• Except criterias, terminology, etc., they also want to:
• Establish universally accepted and reproduceable ranges of normal values across ages for measures for normal hip development.
• DDH may develop during the first weeks of the infant’s life, caused by
  1. severe non physiological sphenobasilar strains
  2. vertebral lesions
  3. fascial tensions including those coming from the viscera or the thoracic diaphragm

• DDH may also develop during the intrauterine period, and postnatally is characterized by presence of distinctly palpated lesions in the pelvis and hip joint or joints with intra-osseous strains of the innominate bones, sacrum and coccyx.
Anatomy of the newborn hip

- Os coxa (coxae)
- Develops from fusion of the ilium, ischium and pubis
- Ischium and pubis fuse at age 4-8
- Ilium to the ischiopubic fuses between 11-14 in females and 14-17 in males
- (17)
Os coxae/innominate (no name)
Lumbar vertebrae

- At birth the lumbar vertebrae are characterized by the three main components. The neural arches of the upper lumbar vertebrae begin to fuse together posteriorly by about age of 1, although fusion in L5 may not occur until the fifth year. Between the ages two and three the centrum and neural arches begin to fuse, culminating with L5 by age of four. (17)
Congenital muscular Torticollis (CMT) definition

- Congenital unilateral contraction of the Sternicleido muscle with inclination of the head towards the side of the contracted muscle, rotation towards the opposite side and facial asymmetry (18)
• “Our son was born with a torticollis and a partiell rupture of a muscle in the neck after a though delivery. He had big problems turning his head to one side, and one of his shoulders were constantly elevated before he got osteopathic treatment.” (Teacher/Parent in the IPC study) (23)

• A typical example is is children with multiple problems like unsettled babies who stuggle in breastfeeding and have problems looking to one side. And after osteopathic treatment I could see that they suddenly could breastfeed easy from both breasts.(Nurse at the Healthcare Station – from the IPC study) (23)
Occiput

• Congenital anomalies of the occipital condyles and upper cervical spine must be ruled out before performing a release of the sternocleidomastoid muscle in a child who fails to improve with physical therapy. (19)
Newborn occiput

- Fusion of the four elements occurs in sequences, beginning posteriorly, usually ending by age of 6-8 years. (17)
• In a retrospective review of 159 children they found that torticollis can predispose to plagiocephaly without synostosis (PWS), but in a large proportion of the cases of PWS, torticollis appeared to develop secondary to plagiocephaly, and that the number of presentations is escalating. (20)

• An other retrospective chart review was performed among 97 consecutive patients between 1/1/2003 and 9/1/2012 with CMT who had hip imaging performed

• They concluded that in the care of a patient with CMT, it is important that the clinician remains vigilant about screening for DDH. An ultrasound or radiograph of the hips should be strongly considered as part of the evaluation of a child with CMT. (21)

• The coexistence rate for CMT and DDH requiring treatment is 4.5%, which is lower than the commonly accepted 20%. (22)
There are definitely coexistence of conditions and confusion about what conditions are recognized, in terms of those 20%, to be defined as common coexistence.

But what does this mean for osteopaths?
Anatomy and palpatory skills

"Your first lesson is anatomy, your last lesson is anatomy and all your lessons are anatomy"  A.T.Still
....and look at the patient in their context!
Interprofessional collaborative approach

- WHY?
- WHO?
- COMMUNICATION (oral/written)

CONTEXT
- Parents
- Siblings
- Physicians
- Physiotherapist
- Nurse
- .....
Parents want to know..

• What is wrong?
• Will my baby be ok?
• How long time will it take?
• What can we do ourselves?
<table>
<thead>
<tr>
<th></th>
<th>Positivist diagnosis</th>
<th>Differential diagnosis</th>
<th>Etiological diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional medicine</td>
<td>Identifying pathology</td>
<td>Differentiate between different conditions with same or similar pattern of symptoms</td>
<td>Seeking for a pathological explanation</td>
</tr>
<tr>
<td>osteopathy</td>
<td>Identifying a pathogenesis</td>
<td>Same as conventional medicine</td>
<td>Factor analysis</td>
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<tr>
<td></td>
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<td>Making a hypothesis: hierarchy of dysfunctions</td>
<td>Seeking the patogene explanation/chain</td>
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The whole is bigger than the summary of all the parts
• Are the identified dysfunctions significant?

• Can they be linked together?

• From what view can we look at the current problem (the clinical presentation)?
Osteopathic treatment is often interpreted within one or more of the following models:

• Postural and Biomechanical Model
• Neurological and Autonomic Model
• Respiratory and Circulatory Model
• Biopsychosocial Model
NECK
PELVIS
Important areas to address
LAB

1. 1. rib
2. SCM
3. Scalenei
4. Cervicals (c2-c6 for all the scalenei)
5. Thoracic vertebrae
6. Pelvic basket
7. Balancing the acetabulum
8. Umbilical ligaments
1. Rib technic

- Supine or sitting
2. SCM

- **Insertion:**
  - Lateral surface of mastoid process and the nuchal line of occipital bone

- **Origin:**
  - Upper part of the anterior surface of manubrium
  - Superior border/anterior surface of medial third of clavicle
3. Scalenii

- **Scalenus Anterior**
- **Origin:** Anterior tubercles of the transverse processes of (C3-C6)
  **Insertion:** Scalene tubercle and cranial crest of first rib
  **Action:** Flexion of the cervical spine, Lateral flexion of the cervical spine,
  **Innervation:** Ventral rami of (C3-C8)
  **Blood Supply:** Branches of the cervical artery
• **Scalenus Medius**

• **Origin:** Posterior tubercles of the transverse processes of (C2-C7)

• **Insertion:** Cranial surface of the first rib

• **Action:** Flexion of the cervical spine, Lateral flexion of cervical spine

• **Innervation:** Ventral rami of (C3-C8)

• **Blood Supply:** Branches of the cervical artery
• **Scalenus Posterior**

• **Origin:** By tendons from the posterior tubercles of the transverse processes of (C4–C6)

• **Insertion:** Outer surface of 2nd rib

• **Action:** Lateral flexion of the neck

• **Innervation:** Ventral rami of (C3-C8)

• **Blood Supply:** Branches of the cervical artery
4. Cervicals (c2-c6)

- Supine or sitting
5. Thoracic vertebrae
6. Pelvic basket
7. Os coxae in three parts
8. Umbilical ligaments

Figure 8.64. Treating the umbilicus.
With permission, Karsten Franke, Hamburg.
Thank you for your attention.
1. Developmental Dysplasia of the Hip Author: Junichi Tamai, MD; Chief Editor: William L Jaffe, MD 2015,
6. F.C. Dwyer. Neonatal Hip Dysplasia; treatment, results and complications, 1975
8. Detection and non operative manegement of paediatric developmental dysplasia of the hip in infants up to six months of age; Evidence baced clinical practice Guideline. Adopted by the American Academy of Orthopaedic Surgeons, Boards of Directors Sept 5, 2014
