Community Pædiatric Review

A NATIONAL PUBLICATION FOR COMMUNITY CHILD HEALTH NURSES AND OTHER PROFESSIONALS

www.rch.org.au/ccch

VOL 13 NO 2 AUGUST 2004

An initiative of the Centre for Community Child Health, Royal Children's Hospital, Melbourne

EXECUTIVE INDEX

Deformational plagiocephaly

What is deformational plagiocephaly?

The most common craniofacial problem today is called 'plagiocephaly', literally meaning 'oblique head'. Deformational plagiocephaly, also known as 'positional plagiocephaly', refers to a misshapen (asymmetrical) head shape.

What causes deformational plagiocephaly?

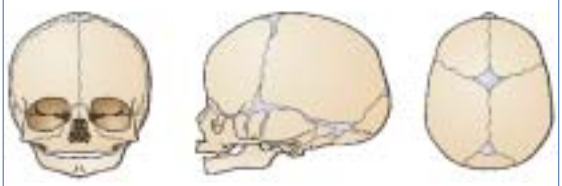
This skull deformity results from repeated external pressure to an infant's skull due to the head being in one position for extended periods (e.g. in a cot or car seat). In these 'positional' deformities, the occiput (back part of the head) is most often flattened. When viewed from above, the head will take on a parallelogram shape and the forehead on the affected side is typically prominent. The ear on the affected side may be pushed forward compared with the other side. There may also be facial asymmetry, with the affected side having a fuller cheek.

How is deformational plagiocephaly different from craniosynostosis?

Infants with craniosynostosis also present with asymmetrical skull shapes. In craniosynostosis, however, the skull deformity results from premature fusion of one or more of the skull sutures. There is no premature sutural fusion in deformational plagiocephaly. The skull and facial asymmetry in craniosynostosis is typically more severe than that of deformational plagiocephaly.

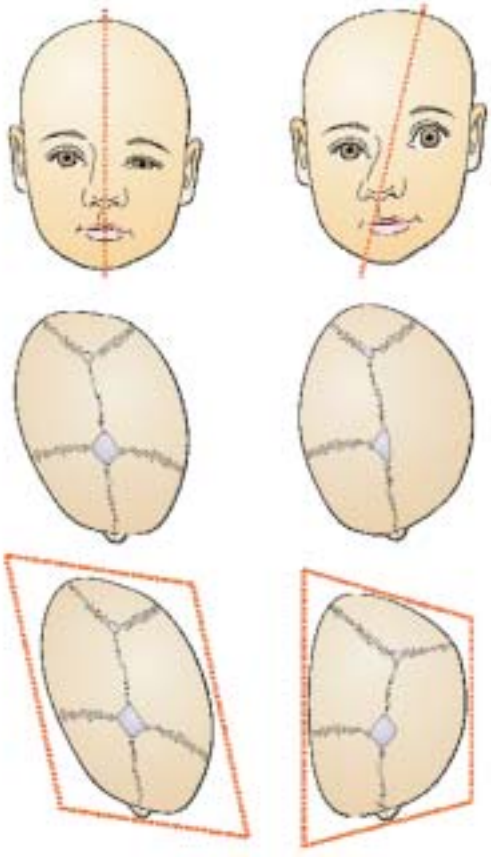
Craniosynostosis and deformational plagiocephaly can usually be distinguished by physical examination. Skull X-rays and CT scans may sometimes be required to differentiate synostotic from deformational plagiocephaly.

Normal infant skull and cranial sutures



Deformational plagiocephaly

Craniosynostosis



Key differences		
	Deformational plagiocephaly	**Craniosynostosis**
Craniofacial features	Parallelogram head shape Nose generally straight Ear more anterior	Rhomboid head shape Nose root deviates towards fused suture Orbit on affected side enlarged Eyebrow elevated Ear posterior
Head circumference	Normal rate of head growth	Progressive slowing in head growth
Causal factors	External pressure, e.g. back sleeping, restricted intrauterine environment, muscular torticollis, prematurity	Internal mechanisms
Diagnosis	Clinical examination	Clinical examination Imaging scans
Treating practitioner	GP and/or paediatrician. If concerns, refer to a craniofacial surgeon	Craniofacial surgeon
Treatment	Repositioning and/or helmet therapy	Cranial expansion surgery

Common causes of deformational plagiocephaly

Extended time in supine position

Infants who spend long periods on their back (eg sleeping, in a car seat or pram, or whilst awake) are at increased risk of developing deformational plagiocephaly. Infants should be placed in different positions when awake to avoid constant pressure on one part of the head.

Torticollis

This is a condition where an infant has a strong preference to turn and/or tilt their head to one side when lying on their back. It may be caused by shortening or tightening of one or more of the neck muscles. Conservative management is the most effective within the first four months of life.

Prematurity

The cranial bones of premature infants are very soft and malleable following birth, and therefore more susceptible to external pressures.

In utero constraint

Less frequently, a baby is born with a flattened skull due to a restricted intrauterine environment or 'crowding' (i.e. multiple births, breech position, small maternal pelvis).

Treatment options

Treatment will vary depending on the nature and severity of the deformity. Some cases do not require any treatment and the condition will improve spontaneously when the infant begins to sit. Diagnosis of co-existing torticollis is important as this does require treatment. If an infant cannot turn their head equally to both sides by six weeks of age, they will require a referral to a paediatric physiotherapist.

More severe deformity with facial and/or ear asymmetry may warrant treatment. In these cases early referral is advised (before six months of age) as the majority of cranial growth is achieved during the first 12 months of life, and the greatest amount of correction will be achieved during this time.

The most common forms of treatment are counter positioning therapy and/or helmet therapy.

Counter Positioning therapy

Counter positioning is most effective for infants younger than four months of age. This involves active and consistent repositioning of the infant's head during sleep to apply pressure to the prominent part of the skull and allow the flattened area to remodel. Treatment may also include different positions for play, eg 'tummy time' (see highlighted box on page 3 for more details). Counter positioning may be done in conjunction with treatment for torticollis.

Corrective helmets

In moderate to severe cases of deformational plagiocephaly, and/or where a trial of repositioning has failed, a cranial remodelling helmet may be recommended. Helmets are made of an outer hard shell and are lightweight with a foam lining. The helmet is custom-made to fit the infant's head by an experienced orthotist. This requires the orthotist to make a casting of the infant's head. The average duration of helmet therapy is usually between 2-6 months of age, depending on the age of the infant and the severity of the deformational plagiocephaly.

The helmet is required to be worn for 23 out of 24 hrs every day. Frequent reviews are required to ensure proper head growth and optimal correction of the deformity.

If a helmet is used it is important to wash the infant's hair daily and observe for any pressure areas. The orthotist will give the family care instructions if a helmet is the choice of treatment.

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Positioning a baby

A baby should be placed on his/her back for sleep to reduce the risks of Sudden Infant Death Syndrome (SIDS). The following suggestions can support parents to take a proactive approach to deal with the "flattening of the head" caused by a supine sleeping position.

- Position the baby with his/her head at the opposite end of the cot every other day. Babies like to look out into the room and also quickly learn which way to look for his/her carer as they come to the cot. If a baby is constantly looking in one direction he/she may develop a flat spot on the side of the head and may also over-develop the muscles on one side of the neck and then have a tendency to not want to look the other way. Alternating the cot end encourages the baby to move his/her head to a different side each time he/she is laid down.
- Placing the baby's favourite toy, mobile or a safety mirror in different places within the cot encourages the baby to move his/her head to different positions.
- Whilst many parents say that their baby does not like being on their 'tummy' it is important to support and encourage parents to place their baby on their tummy. Babies need 'tummy time' to take the constant pressure off the back and sides of the head, but this position also promotes trunk stability, limb coordination and head control. Start with short periods on the tummy and gradually increase the time as the baby becomes more comfortable in this position. There is no need to worry if the baby becomes a little fussy.
- Encourage parents to start 'tummy time' when the baby is very young. This can begin by having the parent place the baby 'belly-down' on their chest while reclining on a chair or propped on some pillows in bed. This position still allows the baby to feel secure and they can see the parent's face.
- Laying a baby prone on your lap or thighs is another alternative. Whilst the baby is in this position a parent can be encouraged to stoke down the baby's back rhythmically, use circular motion between the shoulder blades, and/or play finger games on the baby's back such as 'walking' with fingers. This makes the child relax and enjoy their time in this position.
- When laying a baby on the floor in the prone position it is important to think comfort, distraction and interaction. Place the baby on a blanket or play mat (something that feels good) and the carer may want to place a rolled up towel under the baby's chest to remove some of the pressure off his/her abdomen. Think about the time of day when you do this. He/she will not be comfortable on a full stomach and if they are already tired he/she will not be wanting to be challenged and work hard to lift up their head. Give the baby some distractions by placing a safety mirror or brightly coloured toys in front of him/her. These also encourage the baby to reach out and weight shift. Interact with the baby by lying down on the floor and getting face-to-face with him/her, and make noises, sing songs, or just talk.
- Using different positions when carrying a baby can also reduce the pressure on the head. Using slings or placing the baby on the shoulder are alternatives to always carrying the baby cradled in the forearm.

Reflection questions:

Please use the following questions to reflect on your current practice as a health promoting nurse in light of the article on plagiocephaly.

1. *How do you broach the issue of a 'flattened head' with a parent? Do you wait for a parent to raise their concern or do you raise the topic?*
2. *What advice do you give to parents about positioning their baby for sleep? How do you balance this advice for the reduction of risk for SIDS and plagiocephaly?*
3. *At what age do you discuss 'tummy time' with a parent? Do you model any specific strategies for specific ages? Do you have space and/or equipment to demonstrate 'tummy time'?*
4. *When would you suggest to a parent to take their child for further investigation for plagiocephaly? Would you feel confident in addressing this issue with a parent?*

You may want to look at the following website. This includes a six page booklet for parents, promoting the importance of tummy time whilst giving practical activities.
www.cranialtech.com/MedicalInfo/tummytime.pdf
It is your responsibility to be professionally comfortable with any materials you distribute and/or recommend to parents.

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Community Pædiatric Review

SUPPORTED BY AN EDUCATIONAL GRANT FROM
Wyeth Nutrition
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