4th Congress of Asian-Australasian Society for Pediatric Neurosurgery (AASPN2023)

Dec. 13, Room C

Educational session 1: From basic to advanced management—neuroendoscopic tumor surgery

Tubular brain tumor surgery

Yoshiki Arakawa

Department of Neurosurgery, Kyoto University

Dec. 13, Room A

Symposium 3: Plagiocephaly: positional or synostotic? diagnosis & management

Diagnosis and management of positional plagiocephaly

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In Japan, it is believed that babies' head deformities heal spontaneously and have not been a concern, but in recent years, interest in the shape of the head has increased due to Western influence. Along with this, American-made cranial molding helmets have been introduced to Japan, followed by the spread of Japanese-made helmets. We report here the diagnosis and treatment of positional plagiocephaly (PP) in Japan.

The diagnosis of PP begins with a visual examination. The severity is determined by the Argenta classification with the position of the ears, forehead, and cheeks. If only flattening of the back of the head is observed, it is classified as grade 1. If forward displacement of the ear is added, it becomes grade 2. If protrusion of the forehead is added, it becomes grade 3. If protrusion of the cheek is added, it becomes grade 4. If deformation towards the temporal or parietal of the head is added, it becomes grade 5. Next, a craniometer is used to measure the anterior-posterior diameter, left-right diameter, and diagonal diameter at a 30-degree angle. The difference between the left and right sides (Cranial asymmetry: CA), its ratio (cranial vault asymmetry index: CVAI), and the cephalic index (CI) are calculated. The severity of PP is determined by CA and CVAI, while positional brachycephaly (PB) is determined by CI. Craniosynostosis must also be differentiated from PP. According to the guidelines published in Neurosurgery in 2016, imaging rarely necessary for diagnosing PP. However, distinguishing between early-onset or early infancy unilateral lambdoid synostosis (ULS) and PP can be difficult. This is because early infancy with ULS exhibits PP characteristics such as forward displacement of the affected ear and protrusion of the forehead. Observation of the baby's ears from behind can help with differentiation. In ULS, the affected ear deviates downward. Additionally, non-invasive suture ultrasound can be useful.

Treatment options for PP include repositioning education, positioning pillows, physical therapy, and helmet therapy. The effectiveness of conservative treatment has been demonstrated, and helmet therapy is also recommended for moderate to severe cases of PP in older infants in the guidelines. But, while conservative treatment is covered by health insurance in Japan, helmet therapy is not. In our hospital, conservative treatment is provided for infants under 3 months old or with mild symptoms or who do not wish to undergo helmet therapy. Helmet therapy is offered to severe cases between 4 and 6 months old who wish to proceed with this fully self-funded treatment. Japanese people tend to be brachycephalic with an average CI of 86.5 and severe PB with a CI above 100 is often encountered. Helmet therapy is also performed for PB cases with a CI above 100, in our team. Flattening of the occipital region improves, while the temporal protrusion does not.

It is important to assess an infant's cranial morphology accurately to ensure not to overlook craniosynostosis and to provide appropriate treatment based on age and severity.

Education

1990-1996 M.D., Niigata University School of Medicine
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Medical Training

1996-2002 Resident
Department of Neurosurgery, Niigata University Hospital
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Medical License

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Membership

Japanese Society for Pediatric Neurosurgery
International Society for pediatric neurosurgery
Japanese Society for Neuroendoscopy
Japanese Society of Child Neurology
Japanese Neurosurgical Society
Japan Society of Human Genetics
Japanese Congress of Neurological Surgeons

Dec. 13, Room A

Symposium 3: Plagiocephaly: positional or synostotic? diagnosis & management

Cranial shape induction: management of deformational plagiocephaly/brachycephaly by helmets

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Deformational plagiocephaly and brachycephaly (DP/B) is a head deformity caused by an external force on the intrinsically normal skull. Its incidence in the US increased from 0.3% to as high as 48% after “Safe to Sleep” campaign in 1992 to reduce the incidence of sudden infant death syndrome by the American Academy of Pediatrics. The deformity has the tendency to self-correct. Physical therapy is recommended for mild to moderate cases, whereas molding helmets are applied for more severe cases.

At National Center for Child Health and Development, Clinic for Baby’s Head Shape was established in 2011. It is a specialized clinic for head deformity, mainly DP/B. The Clinic’s missions are prevention and treatment of DP/B, dissemination of knowledge about DP/B, and early diagnosis of craniosynostosis. Our experience with the first 159 patients showed efficacy and safety of molding helmet therapy. We showed that more severe the initial deformity, longer it takes for improvement and more severe the residual deformity. We also showed that there are no clear adverse effects to the patients’ development through helmet therapy. The results with our recent 100 patients showed similar efficacy and safety.

Clinics specializing in DP/B are increasing in Japan. Clinicians should be aware of craniosynostosis as an important differential diagnosis of DP/B. The early diagnosis enables endoscope-assisted suturectomy to be performed, which is a low-invasive treatment only applicable to patients with age of 3-6 months or younger. The late diagnosis may lead to adverse effects to development and head deformity which can be repaired only through surgery. Clinicians should also be aware of the indications of molding helmet therapy, as milder DP/B may self-correct with growth.

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2012 Doctor, Division of Plastic Surgery, National Center for Child Health and Development
2021 Chief, Division of Plastic Surgery, National Center for Child Health and Development

Dec. 14, Room A
Symposium 4: Neurosurgical management of intracranial cystic lesions

What is the best practice? Endoscopic or microsurgery or shunt?

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