

## Treatment and care of children born with cleft palate for optimal speech outcome

Cleft palate with or without cleft lip (CP±L) is the second most common congenital structural anomaly and affects one out of 500 newborns with a prevalence of approximately 200 newborns per year in Sweden<sup>1</sup>. By its location a cleft palate has an impact on structure and function for feeding, hearing and speech. *Surgical closure of the cleft palate is the primary treatment* aiming to provide optimal conditions for normal development of the important functions and also facial growth. Early closure of the palatal cleft is generally advocated for improved speech, whereas late repair is thought to facilitate facial growth. However, the debate on optimal age for palatal closure has been based mostly on unclear comparisons regarding timing, staging, sequencing, and techniques as well as on insufficient methodology for speech assessment<sup>2</sup>. Nevertheless, the “recommended” and most common method is a one-stage procedure between 6 and 18 months of age, preferable with a muscle reconstruction.

Children with an *impaired palatal function* face several challenges in speech development. The prevalence of speech disorders in children with CL/P is high and fairly stable across surgical procedures<sup>2</sup>. Children with speech disorders are noticed by peers and can be met with negative attitudes from their peers<sup>3</sup>. The *results* from a series of small sample studies carried out in Gothenburg<sup>4</sup>, outcomes from the Scandcleft project<sup>5</sup>, a multicenter randomized trial on different methods for cleft palate repair, recent British studies, and by the Stockholm team confirm the rather stable finding regarding speech outcome, even though different timing, staging and techniques have been performed.

However, the *burden of care* in terms of occurrence of secondary pharyngeal surgeries in order to reach the similar outcome differs between different treatment centers. Among the highest figures on secondary velopharyngeal surgeries were presented from the Stockholm team after the recommended surgical procedure<sup>6,7</sup>, whereas among the lowest are reported after the two-stage regimen with early soft palate two-layer procedure<sup>4</sup>, which seems to give the current best prerequisites for a good palatal function. The remaining (residual) cleft in the hard palate should be closed at not later than two years of age in order to facilitate the general speech development and without extra harm for the maxillary growth<sup>8</sup>. Based on the research results, the primary surgical repair was changed by the Stockholm team from the one-stage method with muscle reconstruction to the two-stage method.

The successful implementation of research results is related to the successful process of developing *methods for assessment* actively involving clinicians and teams. The Scandcleft project urged the development of standardized methods for speech assessment, which were implemented in the national routines with test<sup>9</sup>, quality register (<http://lkg-registret.se>), and nowadays also include the global ICHOM cleft palate standard set (<http://www.ichom.org/medical-conditions/cleft-lip-palate/>). A reduced set of validated outcome measures are clinically and patient reported at certain ages for registration in the quality register. Once a year, regional and national networks follow up on methodological and outcome issues with following update in clinical practice and teaching. The best practice thus includes the two-stage regimen for primary surgical treatment of the cleft palate, clinical follow up and register according to standardized routines and methods - all implemented in the Stockholm region.

<sup>1</sup> Hagberg C, Larson O, Milerad J. Incidence of cleft lip and palate and risks of additional malformations. *Cleft Palate-Craniofac J*. 1998;35:40-45.

<sup>2</sup> Lohmander A. *Surgical intervention and speech outcomes in cleft lip and palate*. In: Howard S, Lohmander A, eds. *Cleft Palate Speech: Assessment and Intervention*. Chichester, UK: Wiley-Blackwell; 2011.

<sup>3</sup> Nyberg J, Havstam C. Speech in 10-year-old children with cleft lip and palate – what do peers say? *Cleft Palate and Craniofac J*. 2016;53:516-526.

<sup>4</sup> Friede H, Lilja J, Lohmander A. (2013) Two-stage palatal surgery with early veloplasty and delayed hard palate repair: A balanced view on speech and midfacial growth outcome. In: Berkowitz S (Ed). *Cleft Lip and Palate*. Springer-Verlag Berlin Heidelberg, Germany.

<sup>5</sup> Lohmander A, Persson C, Willadsen E, Lundeberg I, Alaluusua S, Aukner R, et.al. Scandcleft randomised trials of primary surgery for unilateral cleft lip and palate: 4. Speech outcomes in 5-year-olds - velopharyngeal competency and hypernasality. *J Plast Surg Hand Surg*. 2017;51:26-36.

<sup>6</sup> Nyberg J, Peterson P, Lohmander A. Speech outcomes at age 5 and 10 years in unilateral cleft lip and palate after one-stage palatal repair with Minimal Incision Technique - a longitudinal perspective. *Int J Pediatr Otorhinolar*. 2014;78:1662-1670.

<sup>7</sup> Nyberg J, Neovius E, Lohmander A. Speech outcomes after one-stage palatal repair with muscle reconstruction in children with isolated cleft palate – a longitudinal perspective. *J Plast Surg Hand Surg*, 2017 Accepted.

<sup>8</sup> Peterson et al. Mean GOSLON Yardstick scores after different one-stage palatal repairs; a long-term study of patients with unilateral cleft lip and palate. *Cleft Palate-Craniofac J*. 2017 Accepted.

<sup>9</sup> Lohmander A, Lundeberg I, Persson C. SVANTE – the Swedish Articulation and Nasality Test – normative data and a minimum standard set for cross-linguistic comparison. *Clin Ling Phon*. 2017;31:137–154.