

Translational Studies on Grafting Materials in Alveolar cleft repair

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Valorisation Addendum

VALORISATION ADDENDUM

Cleft lips and palates are the most common congenital human facial deformities, which can affect up to 1/500 new-borns depending on the geographic region and the ethnic variation.^{1,2} Epidemiological reports from European registries on orofacial clefts stratified by country demonstrated major differences in the prevalence of cleft lip and palate across different European countries ranging from 2 per 1,000 births in Northern Europe to 1 in 1,000 births in Italy.^{1,2} The highest prevalence of non-syndromic/non-chromosomal cleft lip and palate was noted to be in Germany, Denmark, and the Netherlands with a prevalence around 2 per 1,000 births, whereas the lowest prevalence was recorded in Italy, Spain, and Portugal with less than 1 per 1,000 births.^{1,2} The ramifications of these craniofacial malformations are not limited to its aesthetic disfigurements, but extend far beyond to directly affect patient's quality of living and their functional capacity in speaking, hearing, swallowing, chewing and breathing. This constellation of clinical impairments prompts a comprehensive treatment planning approach, and a complex interdisciplinary care to address all anatomical deficiencies and symptoms, including nursing, corrective surgery, otolaryngology, speech therapy, audiology, psychological and genetic counselling, orthodontics and dental treatment. Most children undergo several primary and secondary corrective surgeries starting soon after birth, their late teenage years and their adulthood in order to correct these multi-faceted craniofacial malformations.³ Therefore, the treatment of this orofacial malformation prompts a significant economic burden on families, the society, and the healthcare system in general. Many highly specialized centers have been established to optimize treatment protocols and monitor clinical outcomes.

Nevertheless, these deformities continue to inflict a life-long significant psychological impact on the patients and their families, especially in issues related to an altered body image. Several studies in the literature have evaluated the psychological impact on patients with cleft lip and palate deformities, and reported heterogeneous psychological disorders affecting self-attributes in children as well as in adults, including: anxiety, behavioural disturbances, inferior cognitive development, depression and dissatisfaction with body and face image.^{4,5} Moreover, further studies reported significant impact on interactional relationships of the affected patients, such as higher levels of sibling rivalry, along with internal feeling of embarrassment, guilt, and neglect.⁵ There is also clinical evidence that these facial disfigurements may interfere with the mother-child bonding, which is considered to be an important determinant of personality and psychological adjustment later in adult life.³ This facial malformation also affect the dynamics of verbal and non-verbal communication, through phonation and facial expression, and the interaction with the family, friends, and the society, and thus has also been described as a "social pathology".⁶

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Thus, disfigurement of the maxilla and the dental arch presents only one aspect of the life-long suffering of children with cleft lip and palate. However, the manifestation of an alveolar cleft defect is presented during a critical phase of the child's development during school age, and a time of intense social interactions with the surrounding community. For children, school is the first place for open social interactions with others, and it plays an essential role in the social integration process and formation of the child's personality. ⁶ By correcting the alveolar cleft deformity during the childhood years, and establishing a favourable dental anatomy, this would decrease the functional limitation of the patient, improve their oral rehabilitation, increase their social acceptance among peers, and normalize their facial appearance and their interactional abilities which would hopefully result in improvement of the overall psychological status of these patients.

By improving the methods of alveolar bone grafting, which is carried during school age, and decreasing the surgical morbidity and improving its outcomes, we would positively affect these children's experiences and promote their psychological wellness as well. However, bone harvesting may be difficult in small children. The biotechnology market has been responsive to these demands in recent years, and played a vital part in translating basic sciences from bench-side to bed-side clinical applications. Continuous testing of novel bone grafting substitutes has thus led to optimisation of bone grafting techniques in various disciplines. In our studies, we propose the utilization of autogenous or xenogenic dentin as an effective adjunct to existing bone substitute materials to maintain volume retention and a stable filling capacity over a long-term period. The feasibility of implementing this in clinical practice sounds promising, given the ease of collection of this natural tissue.

REFERENCES

1. Mossey PA, Modell B. Epidemiology of oral clefts 2012: an international perspective. *Cleft Lip and Palate: Karger Publishers*; 2012. p. 1-18.
2. Allam E, Stone C, Windsor L. Cleft lip and palate: etiology, epidemiology, preventive and intervention strategies. *Anat Physiol*. 2014;4:1-6.
3. Turner S, Rumsey N, Sandy J. Psychological aspects of cleft lip and palate. *The European Journal of Orthodontics*. 1998;20:407-15.
4. Grollemund B, Galliani E, Soupre V, Vazquez M, Guedeney A, Danion A. The impact of cleft lip and palate on the parent-child relationships. *Archives de pediatrie: organe officiel de la Societe francaise de pediatrie*. 2010;17:1380-5.
5. Stock NM, Stoneman K, Cunniffe C, Rumsey N. The Psychosocial Impact of Cleft Lip and/or Palate on Unaffected Siblings. *The Cleft Palate-Craniofacial Journal*. 2016;53:670-82.
6. Lorot-Marchand A, Guerreschi P, Pellerin P, Martinot V, Gbaguidi C, Neiva C, et al. Frequency and socio-psychological impact of taunting in school-age patients with cleft lip-palate surgical repair. *International journal of pediatric otorhinolaryngology*. 2015;79:1041-8.