On Promoting Quality of Prosthodontic Care for Children with Craniofacial Dental Anomalies

I completed my prosthodontics residency 22 years ago and immediately stepped into the epicenter of Cyclone Brånemark. Together with most of my contemporaries, I was caught up in the euphoria and controversies surrounding the introduction to the world of osseointegration. The way forward seemed clear. Edentulism was the scourge of old age, and I was now part of a small cadre of clinician scientists that could finally confront the challenge of eradicating it.

It was almost by accident then that I found myself appointed to staff at 2 pediatric hospitals in Toronto. I had been struck by the overwhelming unmet need for rehabilitative expertise in Ontario's youngsters suffering with craniofacial and dental anomalies. My province, then with 10 million inhabitants, had a well-organized and adequately funded cleft lip and palate/craniofacial dental program managed by pediatric dentists, which employed treatment paradigms driven primarily by orthodontists and plastic surgeons. The prosthodontist was the cleanup hitter, called in to salvage a case gone wrong or too mutilated to rehabilitate using surgical orthodontics alone. Traditional dental materials were his tools, and enamel was all too often sacrificed on the altar of porcelain and gold. Prosthodontics had arrived at a tipping point: The technologies emerging around osseointegration were poised to revolutionize the treatment of adolescents and young adults with craniofacial dental anomalies, just as they had the treatment of the edentulous elderly. The problem was and remains that dramatic differences exist in the availability and quality of craniofacial prosthodontic services, not just across the third world, but across the developed world as well.

None of the part-time and largely under-appreciated prosthodontists appointed to the hospitals with which I suddenly found myself aligned had stayed long, their time and expertise being required to deal with an expanding elderly population and the dramatic needs of maxillofacial surgery patients. After all, a then recently published projection of unmet need for prosthodontic services in the United States estimated it would reach an astounding 293.8 million hours by the year 2000.[1] To this day, I remain the sole prosthodontist engaged full-time in the care of children, adolescents, and young adults in Canada, a country of 32 million. Part of this has to do with the lack of government funding for craniofacial programs in many provinces, and part with demographics, there being a critical demand necessary to justify devoting all or part of one's professional practice to caring for any given segment of the population. Consequently, our discipline has recused itself from the interprofessional craniofacial management team, sidestepping its responsibility to take a leadership role in the introduction of new technologies and philosophies, content to remain a quasi-management afterthought in treatment, and leaving patients and their families to advocate for themselves in attempts to redress abysmal or absent government funding.

So how big is the problem? The table on page 475 presents some hard numbers from the Ontario Cleft Lip and Palate Craniofacial/Dental Program database. The numbers of youth registered in the program in a province of 13 million may seem small at first glance, but keep in mind that most patients enumerated will require continuous surveillance and multiple interventions from infancy to skeletal maturity and beyond, some requiring the attention of a small army of clinicians, including pediatric dentists, orthodontists, oral and maxillofacial surgeons, plastic and craniofacial surgeons, ENT surgeons, speech and language pathologists, audiologists, psychologists, social workers, and prosthodontists.

In spite of an annual budget of more than $6 million (CDN) for 2008 earmarked to cover 75% of the cost of orthodontic therapy and oral surgical and prosthodontic habilitation, the financial implications for families of children with craniofacial dental anomalies are daunting. Many patients from low- and middle-income families will drop out of treatment or go untreated altogether. The problem is that new technologies are causing treatment costs to spiral upwards, so the remaining 25%, when not covered by private insurance, presents itself as a hardship, particularly to those families with more than one afflicted child. To make matters worse, cleft lip and palate and other craniofacial defects have been prioritized over congenital oral defects like oligodontia and acquired oral/facial defects such as trauma and tumors, the upshot being that payments advanced for treatment of the latter defects are capped at such a low level that some families are unable to proceed with their child's care. These are provincial political issues which will be worked out, I'm hopeful, in the fullness of time, but which happen to introduce more universal ethical dilemmas such as how a government exercises *parens patriae*–its duty to act like a parent in taking care of its citizens, how it responds to technological imperatives

which imply that innovations, usually expensive, are inherently better and therefore must be pursued and employed, or how it deals with the aging cohort of craniofacial patients who no longer qualify for youth-restricted funding programs.

It is fair to say that osseointegration has revolutionized the way we have begun to treat patients with craniofacial dental anomalies; and with osseointegration being prosthodontically driven, it stands to reason that we must step up, educate more of our discipline, and assume a leadership role in the management of more craniofacial programs around the world. The future of prosthodontics as a discipline will depend on how it leads the profession through the 21st century in areas of practice that should not be relinquished, treatment of craniofacial dental anomalies being but one example. Tissue engineering offers a related example: A brainchild of surgeons and cell biologists, we can expect that tissue engineered constructs, for all the same reasons as for osseointegration, will ultimately be deployed using prosthodontically driven protocols. Prosthodontists, building on a long tradition of careful evaluation of new modalities of treatment employing materials ranging over the years from ivory to titanium, and the inevitable shift to biological constructs, could very well become the enlightened choice to lead craniofacial dental programs in complex rehabilitation in the future.

A conclusion of the Eurocleft 2000 Project,[2] that the level of care a child born with a cleft will receive depends almost entirely on where in Europe he or she is born, may apply just as well to a child born anywhere else in the developed world requiring prosthodontic care. We can start by acknowledging this truth and agreeing to do something about it. As a discipline, we should compile a registry of craniofacial prosthodontic services available worldwide, and articulate a set of policies governing the clinical practice of prosthodontists on craniofacial teams, guidelines defining the minimum standards of care for prosthodontic treatment of children, a mechanism to compare outcomes of treatments among centers, and strategies for collaborative research. The demand for prosthodontists trained in the care of craniofacial dental patients is strong, but the supply is weak. As clinical educators we must reform the existing token training in craniofacial prosthodontics. We must also drive and direct new prosthodontists to attain the required expertise, as well as be given the opportunities necessary to advance the quality of service and research for all children born with craniofacial dental anomalies.

Numbers of Patients by Diagnosis and Age Enrolled in the Ontario Cleft Lip and Palate/Craniofacial Dental Program as of June 30, 2008

Diagnosis	Age (years) 0–17	18–21	22 & Over	Total
Acquired Facial/Oral Defect	642	386	211	1,239
Cleft Lip & Palate	3,996	918	508	5,422
Congenital Oral Defect	1,158	489	238	1,885
Craniofacial	1,427	651	271	2,349
Total	7,223	2,444	1,228	10,895

Acquired Facial/Oral Defect includes tumors, trauma, cerebral palsy, muscular dystrophy, and juvenile rheumatoid arthritis. Cleft Lip and Palate includes clefts of the lip, palate, and submucous clefts. Congenital Oral Defect includes amelogenesis and dentinogenesis imperfecta and oligodontia missing more than 6 teeth. Craniofacial includes chromosomal anomalies affecting the craniofacial skeleton including ectodermal dysplasias, velopharyngeal insufficiency, and temporomandibular joint conditions.

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