

Craniofacial stem cell therapy: New light at the end of the tunnel



Cranio-maxillofacial skeletal defects may be a result of various causes. It could be either due to congenital malformations, trauma, tumor resection and even following severe infection. For all practical purpose, use of autogenous bone graft is still considered to be the “clinical, economical and practical” gold standard for the reconstruction of cranio-maxillofacial skeletal defects. But such a procedure has several issues such as second surgery and donor site morbidity.^[1] This can be eliminated by the advent of tissue engineering, as delineated by Langer and Vacanti (1993)^[2] as an interdisciplinary field of research that applies both the principles of engineering and the processes and phenomena of the life sciences toward the development of biological substitutes that restore, maintain, or improve tissue function.

With the advent of craniofacial tissue engineering, more probabilities came into existence.^[3] There have been several references, success stories^[4] of tissue engineering aided craniofacial reconstruction. In recent times, a huge case series of various craniofacial reconstructions has been reported.^[5,6] This report comes at a time when ethics of tissue engineering was debated.^[7] The case series utilized the novel approach of *in situ* ossification using adipose stem cells as the primary “nonmorbid source of autogenous mesenchymal stem cell.” Moreover, it is claimed that this study is the large scale, first good manufacturing practices compliant nonhematopoietic nonhematologic application for autologous adipose-derived stem cells in the treatment of craniofacial skeleton. The researchers have identified the way to shorten the craniofacial stem cell therapy through their modification of *in situ* ossification procedure. Moreover, it has now been established that different areas of cranium require different methods. The

reconstruction protocols of the protective cranial skeleton are much different from the masticatory components. The protocol required for the site of chronic infection is much more varied. However, the success of the adipocyte-derived stem cell therapy constructs by these authors adds credibility to this newer technology.

I believe this robust case series provides a prominent light in the end of a long tunnel. Now, we know that things would and could work in an efficient way. We have proof and further research could shorten the time lag between the adipocyte (fat) harvesting to grafting into the needed site. Additional research into the signaling pathway would yield a clue for fastening the uptake of graft and rapid deposition of the new bone. Moreover, future works would also refine this prototype procedure into a chair side procedure in a big way.

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