Editorial

Regenerative Medicine in dentistry: New Horizons

Despite the current availability of a plethora of treatment modalities, substitutes, and various clinical adjuncts, autogenous tissue replacement are still the gold standard to which all other reconstructive procedures are compared. However, autogenous grafts have several significant limitations, namely the availability of competent sites and inherent donor site morbidity.In oral and maxillofacial area, skin, muscles, bones , tendon, mucosa and teeth made reconstruction efforts very complicated to reach to the optimum point of function, aesthetic and mastication.

The traditional triad of tissue engineering attempts to replicate the intrinsic properties of autograft reconstructions.This triad consists of sufficient competent cell transfer, structured scaffolding that maintains space and provides conduction, and the application of miscellaneous growth factors that can further induce adjacent mesenchymal osteogenesis. The added major advantage of tissue engineering over autogenous grafting is that engineered tissue is produced in an ex vivo context that avoids the drawbacks of autograft donor morbidity and availability.

Current researchers continue to concentrate on promoting the tissue-engineering model as the new "state of the art" in dentistry. Jaw bones, oral mucosa and teeth are the main target for either regenerative medicine or tissue engineering in this area.

Several clinical conditions such as trauma, tumor resection and congenital malformations are characterized by a loss/lack of bone tissue which necessitates intervention to promote repair. Despite many advances in tissueengineering, an exact reconstructive recapitulation of large defects continues to be beyond reach. Till today for the critical sized defects there is no general consensus that regenerative methods could be an appropriate replacement for autogenous tissue transfer. For edentulism, the standard treatment is still the use of dental implants. Moreover, physiologic atrophy of alveolar ridges following tooth extraction might necessitate a bone augmentation procedure for dental implant treatments to become feasible. In non-critical sized defects the scenario was somehow different and cell based approaches showed satisfactory results. Bone marrow mesenchymal stem cells seeded on biphasic hydroxyapatite-tricalcium phosphate used in treatment of posterior maxillary atrophy and sinus floor augmentation. Alveolar clefts patients also benefitted from the use cell therapy .we treated more than 10 patients by delivering stem cells to the cleft defects. Mesenchymal stem cells also resulted in enhancement of osseointegration around dental implants. Recently dental pulp can serve as a good source for harvesting and culturing mesenchymal stem cells and is going to the main source in dentomaxillofacial regeneration. In future by using bioreactors, enhancement of cell delivery methods, co culturing of cells, gradual concomitant release of growth factors during cell seeding and recipient site development, regenerative dentistry might be an appropriate treatment solution for patient tooth or jaw loss.

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