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Future of Dentistry: Stem cell Approach

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Stem cells prove to be a promising as well as an effective novel approach in the regeneration of the periodontal apparatus. There are many other approaches for periodontal regeneration that include guided tissue regeneration (GTR), numerous growth factors, a variety of grafts, etc., but all these methods do not offer complete restoration of the lost periodontium. Stem cells are uncommitted entities capable of both self renewal and differentiation into multiple cell lineages. In general, there are certain types of stem cell populations that are identified from embryonic and postnatal tissues. In principle, evidence for the viability of this approach has been demonstrated in animal studies showing that autologous cultured periodontal cells can support regeneration *in vivo*. This approach is further supported by evidence that PDL cells have stem cell properties. A new and promising approach to periodontal tissue engineering involves using periodontal cell sheets prepared *in vitro* and subsequently transplanted into periodontal defects. Periodontal regeneration requires consideration of many features that parallel periodontal development, including the appropriate progenitor cells, signaling molecules and matrix scaffold in an orderly temporal and spatial sequence. It is clear that current regenerative procedures are less than ideal but the identification of stem cells in human dental tissues in recent years holds promise to the development of novel, more effective approaches to periodontal regeneration and reconstructive therapy. One way forward is to embrace the field of stem cell-based tissue engineering and adopt an interdisciplinary approach to periodontal regeneration. Hence this paper presents a promising innovative approach to the field of dental tissue regeneration.

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