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Technique for Periodontal papilla regeneration (resolving dark triangles) using 3D Exosomes and PEM Paste.

When treating atrophied periodontal papilla, leveraging the regenerative potential of 3D exosomes and Polypeptide 3D Exosome Media (PEM), tissue regeneration techniques can significantly enhance esthetics. Below is a suggested strategy based on the latest research and clinical practices:

1. Preparation of 3D Exosome-Functionalized Platforms

Materials

- **Exosome Source:** Use MSC-derived 3D exosomes known for their osteogenic, regenerative soft tissue and angiogenic properties.
- **Polypeptide 3D Exosome Media (PEM) Paste:** 3D exosomes integrated into the 3D culture material which also includes additional regenerative and growth factors: Epithelial Growth Factor (EGF), Fibroblast Growth Factor (bFGF), Platelet Derived Growth Factor (PDGF), Hepatocyte Derived Growth Factor (HGF), Collagen type 1, Factor-11 (GDF-11) growth differentiation-rejuvenation factor and regenerative markers. This material provides structural support and is conducive and inductive to soft tissue regeneration.

2. Delivery Approach

Technique

- A well-established suitable oral hygiene program is suggested for optimal results.
- Lightly Anesthetize the facial mucogingival line where the atrophied gingival papilla requires regeneration therapy. **DO NOT** inject anesthesia directly into the papilla.

- Place a short 30-gauge luer-lock needle on the 1 mm PEM Paste syringe.
- With a single-entry point being careful to stay inside the shortened papilla, gently inject a small amount of PEM Paste into the gingival papilla(s) until the deficient papilla begins to blanch (careful not to not overfill the papilla area as heavy blanching will occlude the blood supply).
- Using an insulin syringe (BD Insulin Syringe 31 gauge ultra fine 8 mm {5/16"} needle), inject 0.5 ml of 3D exosomes at the facial muco-gingival line in the area of the papilla(s). being treated (this step is only done during the initial treatment appointment).
- The patient may require 3-4 weekly procedures of the PEM Paste to regenerate the gingival papilla to acceptable levels.

Advantages

- **Synergistic Effects:** Combining the layered 3D exosome-loaded PEM Paste leverages the strengths of this technique, providing a sustained release of 3D exosomes from the PEM Paste and the localized 3D exosome injection.
- **Enhanced Healing:** This combined approach can enhance early soft tissue/bone healing and promote long-term regeneration, improving the overall success of the procedure.

Clinical Considerations

Patient Selection

- **Assessment:** Evaluate the patient's overall health, compliance, soft tissue/bone quality, and the extent of the defect to determine the suitability of using exosome-functionalized platforms.

Post-Operative Care: Monitor the patient for signs of healing and provide appropriate post-operative care to ensure optimal outcomes.

Conclusion

Using 3D exosome-functionalized PEM Paste for atrophied papilla offers a non-invasive approach to enhance healing and soft tissue regeneration. By combining 3D exosome-functionalized PEM Paste and direct 3D exosome placement at the mucogingival line clinicians can create a conducive and inductive environment for soft tissue regeneration, improving the success rates of amplifying atrophied papilla.