Tissue reaction to repair cement based on MTA with high plasticity in subcutaneous of rats

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This study evaluated the biocompatibility, through histopathological analysis and immunohistochemistry of a new repair cement: MTA HP (Angelus Londrina, PR). White MTA (Angelus Londrina, PR), and a material based on zinc oxide and eugenol (IRM, Dentsply, Petrópolis, RJ) were used for comparison. Thirty male Wistar rats had inoculated into the subcutaneous tissue an empty polyethylene tube (negative control) and three more tubes, each filled with one of the tested materials. After 7, 30 and 60 days of tube implantation the specimens were removed, fixed and embedded in paraffin. The sections were stained with hematoxylin and eosin and gomori trichrome to assess inflammatory reactions and also stained with Picrosirius Red to quantify as type I and type III collagen fibers. The presence of angiogenesis was performed using the VEGF (vascular endothelial growth factor) marker. Non-parametric data were analyzed using the Kruskal-Wallis assay followed Dunn's test. The significance levels adopted were 5% ($P < 0.05$). The results demonstrated a significant difference in inflammatory response after 60 days between IRM and empty tube groups ($P < 0.05$). MTA HP showed similar biocompatibility to the White MTA and the negative control group in all experimental periods. Furthermore, after 7 days MTA HP stimulated less pronounced angiogenesis than White MTA, as it initially exhibited slower extracellular matrix remodeling when compared to White MTA and IRM. A decrease in the thickness of the fibrous capsule and the immunostaining with VEGF in all experimental groups and control throughout the healing process was observed. After 60 days, the experimental groups presented extracellular matrix with more mature connective tissue, with predominance of type I collagen fibers. According to the results, it can be concluded that the MTA HP was biocompatible in all the experimental periods, presenting similar results to the control and experimental groups with White MTA and IRM.

Keywords: Mineral trioxide aggregate; Biocompatibility; Immunohistochemistry; Subcutaneous tissue of rats.

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