

World Congress on

Human Genetics

November 07- 08, 2016 Barcelona, Spain

Nano-silver suture as a new application for healing of periodontal flaps: *In vitro* histopathological, double blind study

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Background & Aim: It has been postulated that conventional suture materials such as silk may enhance bacterial biofilm growth causing delay in healing of surgical sites. Nano-silver particles with their anti-bacterial agent properties could be helpful. This study evaluates the role of nano-silver particles on the inflammatory process of gingival suture in comparison with usual silk suture in animal model.

Method & Materials: In this double-blind clinical random study, 12 female rabbits were selected. They had healthy teeth and no periodontal disease had been found by clinical and radiographic examinations. Our innovated nano-silk was prepared in sterile condition and under special circumstances with nano-silver particles. Two different density of Nano-silk (A and B) were prepared. A suture contained 60 ng of silver and B sutures included 120 ng of silver. Nano-silk sutures thread and conventional silk suture thread were sutured on the buccal surface of the gingiva of mandibular incisors. Histological changes on 4th and 7th day after suturing were evaluated to assess the inflammatory process.

Results: The histological results showed that the application of this new suture material may improve inflammation process and promote wound healing. We also observed a relatively marked difference between the two groups in the 4th and 7th day in the inflammatory cell components and edema. These two parameters are important factors in the wound inflammation process. Our results suggested that the density of nano-silver particles in nano-silk B causes less inflammatory response in comparison with nano-silk A and therefore a better scaffold for parenchymal and mesenchymal factors is made one week after surgery.

Conclusion: Silver particles due to their beneficial effects as antibacterial and wound healing accelerator in the periodontal surgeries could reduce inflammation and promote healing process. So nano-silver sutures could be helpful for and produce a more favorable healing when used in oral and maxillofacial surgery.

Biography

Majid Zakeri has completed his DDS from Mashhad University of Medical Science, Iran and Fellowship in Aesthetic Dentistry from Università degli Studi di Genova, Italy (2014). He is the Technical Director of Novin Dentistry Clinic affiliated to Red Crescent of Khorasan Razavi Province, Iran. He has invented dentistry mouth opener, nanopack dressing for oral surgery and nano silver stitch for oral operation. He is a peer Reviewer of the *British Journal of Medicine and Medical Research* and Member of International Federation of Inventors Associations (IFIA) Agent in Iran.

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