



## CASE REPORTS: TREATMENT OF EXODONTIA WOUNDS WITH HIGH FUNCTIONAL GEL MADE FROM NANO-EMULSION CONTAINING VITAMIN C, E AND PROPOLIS EXTRACT.

Chirag Mukhi<sup>1\*</sup>, R Krishnakumar<sup>2</sup>, Priya Marathe<sup>1</sup>, Vikrant Bhagwat<sup>1</sup>, Roshni Mukhi<sup>3</sup>,  
Kunal Advani<sup>1</sup>

1PG Student, Department of Oral Medicine, M.A.Rangoonwala Dental College & Hospital, Pune, Maharashtra, India.

2Professor & Head, Department of Oral Medicine, M.A.Rangoonwala Dental College & Hospital, Pune, Maharashtra, India.

3PG Student, Department Of Public Health Dentistry, Sinhagad Dental College & Hospital, Pune, Maharashtra, India.

Corresponding Author:- **Chirag Mukhi**

E-mail: [chiragmukhi2007@rediffmail.com](mailto:chiragmukhi2007@rediffmail.com)

Article Info	ABSTRACT
<p>Received 15/01/2016 Revised 27/02/2016 Accepted 03/03/2016</p> <p><b>Key words:</b> Nanoemulsion gel, exodontia, Minor surgical wound, Vitamin C, Vitamin E, Propolis Extract.</p>	<p>As progress in medical science meet new frontiers every day, Oral Medicine and its practice have also reaped the benefits of this discovery boon. However, the more we learn, more it appears to be seen, studied and understood. One such entity is post extraction socket wounds. For Oral Physicians it is frustrating to treat oral wounds due its unique environment and the same condition is disabling for patients hampering their quality of life for few days till wound heals in oral cavity. In a gel base nano-emulsion state having main ingredients as Vitamin C, E and Propolis extract was used to treat Exodontia Wounds. We observed the process of wound healing and curing effect on post extraction wounds and found wound healing rate was accelerated and no side effects were noted. After treating series of cases with nano-emulsion gel containing Vitamin C, E and Propolis extract we gained confidence and concluded that nano size vitamins and Propolis extract proved to show rapid healing with minimal post-operative complications. So we report few of our cases with review of literature.</p>

### INTRODUCTION

Nanotechnology uses the modern techniques to manufacture a material or structure purposefully with dimensions between 1 and 100 nanometers to leverage the unique properties it has at that size [1]. One nanometer is  $10^{-9}$  of a meter. Nanotechnology represents a modern approach of manipulating the material at atomic and molecular levels [2].

Local drug delivery system is a modality in which an administered drug reaches the target effectively and efficiently. In order to use local drug delivery system efficiently, high level techniques to determine the size of drug, means of transmission and target site are required [3] and so nanotechnology is hot topic in medicine these days.

In Indian subcontinent, not much of research on nano local drug delivery system is reported in field of

dentistry. The rationale for selection of post-operative minor oral surgical wounds is that it can be observed macroscopically facilitating the invention a new drug.

The term "Nanoemulsion" means a thermodynamically stable isotropically clear dispersion of two immiscible liquids, such as oil and water, stabilized by an interfacial film of surfactant molecules [4].

We used a nano-biofusion gel containing Vitamin C, E and Propolis extract which has an excellent antioxidant, antibacterial and anti-inflammatory effects which protects intraoral soft tissue wounds due to its highly viscous state and facilitates rapid healing. Because of its nano-complex nature when applied on the site of minor oral surgical wound, it gets directly absorbed into the tissues and also stays on the tissues as bio-active



protective film promoting process of healing[5]. Due to such protective dressing and highly active medicaments incorporated in them minor oral surgical wounds heal without any side-effects. This study focuses on the healing effect of Nano-emulsion gel containing Vitamin C, E and Propolis extract in healing of post oral surgical wounds by introducing cases in which healing was augmented by using the gel at site of procedure by operator.

**Case Reports**

We treated a total of 50 patients to study the efficacy of nano-biofusion gel containing nano Vitamin C, E and Propolis extracts. Few of the case reports are presented below to show effect on wound healing rate after 24hrs of exodontia procedure.

**Case 1:-** Extraction of over-retained lower deciduous tooth was planned so as to go ahead with orthodontic treatment. Under local anesthesia, extraction was done followed by local application of nano-emulsion gel containing Vit. C, E & Propolis extract. After 24 hrs, signs of normal healing process were evaluated. Negligible signs of inflammation were noted and accelerated process of wound healing could be appreciated only after 24hrs with only one local application of nano-bio fusion gel.(Case 1a-1d)

**Case2:-** Nano-bio fusion gel was applied at site on upper left canine which was endodontically treated and fractured and could not be restored. So exodontia procedure was advised for future rehabilitation at site of canine. After 24hr follow up there was subsidence in size of wound after extraction dramatically & pain was also relieved without administrating any systemic drugs.(Case 2a-2c)

**Case 3:-** Nano-Bio fusion gel was applied on the site of

grossly decayed upper anterior teeth planned for exodontia for future prosthetic rehab. After 24 hrs on follow up good healing was noted with healthy granulation tissue and negligible signs of post extraction inflammation. Neither intraoral mouth rinse nor antibiotics were used.(Case3a-3d)

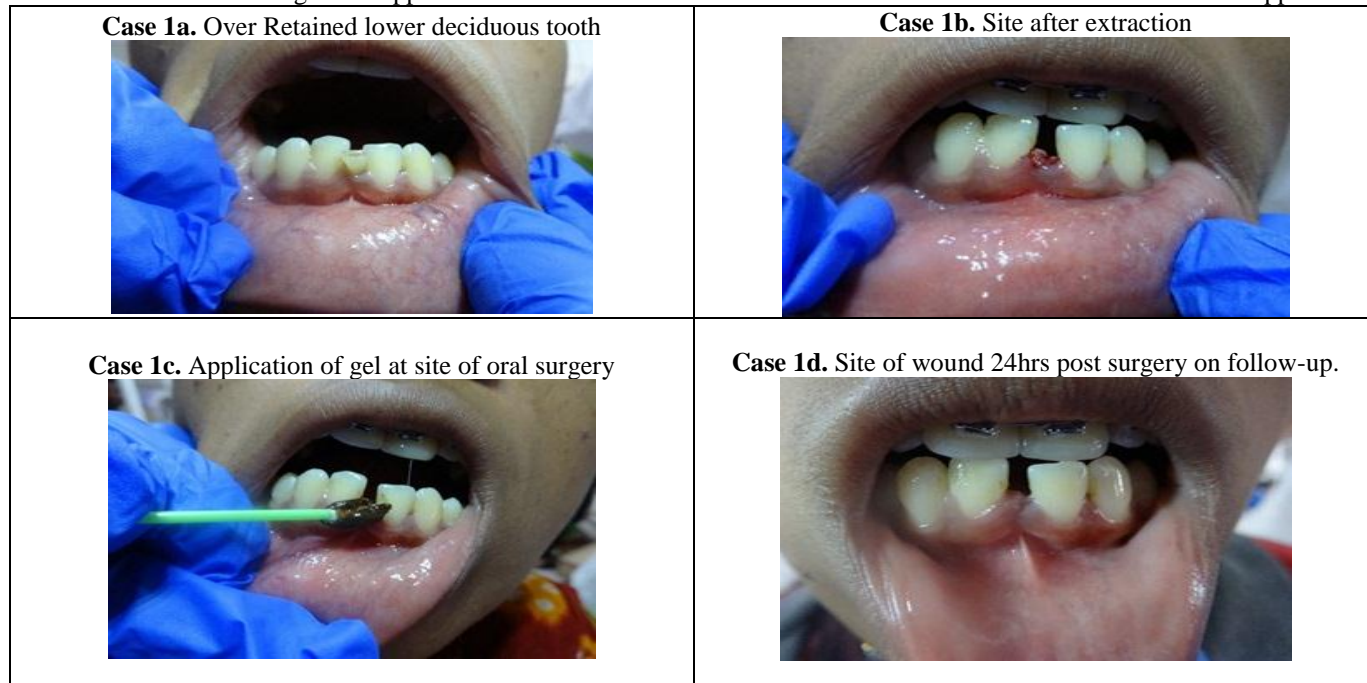
**Summary:-**

Vitamin C plays an important role in cell growth and regeneration of oral tissue. It helps in formation as well as stabilization of collagen along with osteoblast function and osteoid formation. Vitamin E works in synergy with Vitamin C and plays an important role in maintaining the integrity of the cell membranes. Vitamin E acts as an antioxidant to limit free radical reactions and to protect cell from lipid peroxidation[6]. Besides this Propolis which is extensively used in folk medicine a resinous mixture produced by honey bees has a good anti-microbial action [7].

The Nano-Bio technology amplifies the antioxidant power and allows and allows the ultra-fine antioxidants to surpass the moist intraoral environment and enters the cells[8] to rejuvenate, revitalize, support, protect and optimize gum and oral soft tissue.

Nano-Bio fusion gel has been formulated bio-adhesive antioxidant gel harvesting naturally occurring antioxidants for targeted action. The nano bio-fusion technology amplifies the natural antioxidant power of Propolis, Vitamin C & E.

Any Nano-particle is 10 times more potent in 100 times smaller quantities than micro sized particles most commonly available in the market. Even only one application as done in above cases nano-bio fusion gel creates nano-bioactive protective film which results in increased absorption[9], resulting in improved clinical effectiveness and visible results after application.



**Case 2a.** Site of canine where extraction was planned.



**Case 2b.** Application of gel at site of socket.



**Case 2c.** Extraction site after 24hrs showing excellent contraction of wound & epithelization.



**Case 3a.** Grossly decayed upper anterior teeth



**Case 3b.** Intraoral site after extraction and placement of sutures



**Case 3c.** Application of gel at site of oral surgery



**Case 3d.** Healthy granulation tissue and negligible inflammation post oral surgery.



## DISCUSSION

It is difficult to treat oral mucosal wounds due to the unique environment and commensals of oral cavity. Major issue in treatment of oral mucosal diseases is rapid dilution of drug material and its retention in oral cavity because of various factors[10].To combat these problems only nanosize particle medicine proved to be effective in this characteristics.

To alleviate the post-operative symptoms usually analgesics and antibiotics are prescribed. These medications can be divided into oral and topical, according to their mode of administration. Common side effects of oral medications are gastrointestinal discomfort and topical medication hardly retains in oral cavity due to highly humid intraoral environment. So the need of the

hour was an effective local agent which will protect oral lesions and facilitate healing.

Nanobiofusion gel containing Vitamin C, E and Propolis extract is a combination of two newer technologies (nano-technology and medical biotechnology). Nano Vitamin C, E is already biocompatible and is known to act on immunity and antioxidation. Studies on Propolis have proved its antimicrobial and anti-inflammatory effects[11]. Due to its nano-complex nature, nano emulsion containing multiple Vitamins and Propolis extract directly gets absorbed into tissues and forms a bio-active protective film. This film protects the lesion from moist oral environment and absorbed gel contents facilitate healing because of antioxidant and anti-inflammatory effects. Positive favourable results of wound healing were obtained which is reported in this study.

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## CONCLUSION

There is a limited medication for effective treatment of oral wounds. Also there is an increased demand of an appropriate medication that will have a longer retention in the oral environment. We applied Nano-Bio fusion gel containing Vit C, E and Propolis extract on oral mucosal wounds and favorable results were observed without administering antibiotics, analgesics or mouth rinses in addition to the gel.

In conclusion we gained confidence that Nano-bio fusion gel containing vitamin C, E and Propolis has high antibacterial and anti-inflammatory properties. This aids in rapid healing of oral lesions thus, contributing to an augmentation of the quality of life of patient.

