

ANALYSIS OF BONE IMPLANT TO CONTACT VALUE USING SCANNING ELECTRON MICROSCOPE IN POST IMMEDIATE IMPLANTS WITH ADDITION OF GEL-EXTRACTED *ROSELLA* FLOWER

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Received: 20 September 2018, Revised and Accepted: 9 December 2018

ABSTRACT

Objective: The objective of the study was to analyze the difference of bone to implant contact (BIC) value post-immediate implants with or without injecting rosella flower extracts gel in mongrel.

Methods: A total of 18 implants were inserted in 9 mongrel's dog. The implant was divided into two groups. The first one (test implant) was implanted immediately after injection of gel-extracted rosella flower 10%, while another group (control implant) was implanted immediately after the tooth extraction. The histomorphometry analysis was done after 14, 28, and 56 days to find out the BIC value.

Result: The mean value of BIC rosella group was 63.44% and the mean value of the control group was 52.11%, with $p=0.041$.

Conclusion: Rosella flower extract is able to shorten the inflammatory phase after implantation, accelerate and expand bone growth by spurring collagen deposition as well as inhibiting osteoclast activity.

Keywords: Implant, Rosella, Bone to implant contact.

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INTRODUCTION

A successful criterion for an implant is related to the maximum attachment of the bone which is in contact with the implant. The successful use of implant depends on osseointegration affected by several factors, such as biocompatibility of the implant, quality and quantity of the bone available, and the force that can cause mobility during bone healing time.

The properties of the implant surface determine the formation of new bone tissue and bone osseointegration. Requirements for implant materials include biocompatibility, bioactivity with surrounding tissue so that osseointegration can occur, provide mechanical properties that are compatible with the part replaced in the body, resistance to corrosion of fluid contained inside the body [1,2].

The implant surface has been developed in the last decade concentrated in an attempt to provide a faster increase in the osseointegration process. Several modifications of the surface have been developed and currently used to improve the implant performance. The surface modification of titanium implants has been performed to be osteoinductive and osteoconductive so that osseointegration occurs, such as making the titanium surface bioactive by modifying the chemical composition and topography of the implant surface corresponding to bone cell retention on the surface of titanium implants [3].

Rosella flowers (*Biscus sabdariffa*) are beneficial for improving the health and stamina of the body because the rosella flowers contain Vitamin C and high essential minerals. Vitamin C of the rosella flowers is also believed to ward off cancer-causing free radicals. High calcium can prevent bone loss, while certain substances in the rosella can rejuvenate the body cells and protect the body from infection of bacteria and viruses (Budi Sutomo) [4].

According to the Indonesian Health Ministry, every 100 g of rosella contains 260–280 mg of Vitamin C, Vitamins D, B1, and B2. In addition, rosella contains high calcium (486 mg/100 g), magnesium, and omega 3.

The active ingredients of rosella petals are grossypeptin, anthocyanin, glucose hibiscin, niacin, riboflavin, beta-carotene, iron, polysaccharides, and flavonoids [5].

Numerous studies have also shown that rosella flower extract can help wound healing and as an anti-inflammatory. This study aims to see whether the roselle extract gel is able to accelerate the formation of new bone around the implant.

METHODS

This research is an experimental research with a post-test design with the control group. The research took place in Biofarmaka Laboratory, Hasanuddin University, Physics Laboratory, Universitas Negeri Makassar, from June to September 2017. The study was divided into three stages: Rosella gel preparation, implant installation, and evaluation using Scanning Electron Microscope (SEM).

- a. Making rosella gel extract
The fresh rosella flower petals were washed and rinsed with clean running water to remove any sticky impurities and ants on it, then drained and aerated. Drying was done by heating in an oven with a temperature not $>50^{\circ}\text{C}$. After drying, it is dried and pollinated with blender or pollinator until smooth. The dried rosella flowers were weighed as much as 100 g, then took ± 500 ml (1:5) of 96% ethanol solvent. Soak the dried simplicia powder of rosella flowers in ethanol for 24 h until the solvent was saturated. Furthermore, rosella extract was added by gel ingredients while homogenized to evenly in the gel base. 10% rosella flower gel extract was then put into a sterile disposable spoit container.
- b. Preparation of experimental animals
Nine dogs were divided into three groups (days 14, 28, and 56). The mongrel dog was premedicated with atropine 0.2–2 mg/kg and xylazin 1–3 mg/kg intravenously. The dog underwent the extraction of the first left and right premolar teeth with forceps; then a sulcular incision was made along buccal and lingual side on the crystal wall.

