

# Egg Shell-A Journey from Garbage to Regeneration

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**Abstract:- Regeneration of the lost periodontal tissues is the true reflector of successful periodontal therapy. The biomaterial plays a Vital role in the process.**

**The Choice of Regenerative materials available currently are limited in terms of Osteogenicity, biocompatibility, availability, quantity and the expenses.**

**Hence, the Eggshell with its inherent characteristic of being biocompatible and also economical as it is available in huge quantities can be a promising alternative for commercially available materials.**

## I. INTRODUCTION

The success of the regeneration of the lost periodontal tissues is largely based on the material used for the periodontal therapy. The Auto-graft is the choice of material provided it is available in the required quantities. The need to create another wound site to obtain the graft is also a concern.

The artificial products commercially available are far from satisfactory. The only promising Tri-calcium phosphate is produced by the harmful chemicals such as nitrates, that are harmful even in small quantities. Hence the need of the hour would be a biocompatible material with bio-active elements, available in adequate quantities, easy to synthesize and also economically viable.

## II. DISCUSSION

The Recent discovery of synthesizing the regenerative material from the eggshell like bio-waste would be the answer for the need of the industry. The bio-ceramics derived from the eggshell are found to have bioactive elements in them and are biocompatible too.

The eggshell constitutes of 11% of total Egg weight and is made up of three layers. The outermost layer is the foamy Cuticular layer, middle layer is spongy and the innermost is the lamellar one. The inorganic component consists of mainly calcium carbonate at 96% and organic portion is the other 4% comprising of magnesium carbonate at 1%, calcium phosphate 1% and other insoluble proteins. The presence of calcium carbonate in a large quantity

contributes to the better strength and mechanical properties of the regenerative material derived from the eggshell

The ball milling process is the most commonly used method to procure the regenerative material from the eggshells. It is produced in the form of tri-calcium phosphate Nano powder which is thermally stable and also being a thousand times smaller than the width of a single human hair.

The fabricated scaffold using the eggshell derived material has shown to be promising in the direction to procure an ideal regenerative material. It is shown to support the cell attachment, differentiation and proliferation required for the periodontal tissue regeneration. The effect of the processing conditions on the nature of the powder was also found to be minimal by the ball milling process.

In conclusion the eggshell waste is a very promising alternative to replace the commercially available regenerative materials. They are biocompatible, inexpensive and can also be obtained in the large quantities. With further research and an accepted standardised method of development to procure the material the eggshell has the potential to be developed as an implantable biomaterial for periodontal tissue regeneration.

## REFERENCES

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