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Filling of Post-Extraction Dental Socket with Hydroxyapatite Granules APAFILL-G ™

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Abstract

The efficacy of APAFILL-G as filler to prevent the resorption of alveolar bone after tooth extraction has been demonstrated. After seven days the results revealed that only one (3.1 %) of all treated patients experienced an adverse response (inflammation and pain) observed at the clinical evaluation that promptly disappeared after analgesic treatment. The rest, 32 (96.9 %), had no adverse clinical response.

Radiographically, a continuous radiopacity between bone and the implant was always observed; also no evidence for implant resorption was detected. After one year the surrounding alveolar bone maintained its contour without symptoms of resorption for the 100 % of the patients.

Introduction

The post extraction bone resorption is an increasing problem in modern dentistry. Maxillar or Mandibular Alveolar Atrophies (MMAA) are caused by the bone losses in the healing_process after extracting the dental organs This is a biological condition that affects the patients, limits to the specialist for a correct rehabilitation and it can also produces functional and aesthetic alterations, which may lead to an inadecuaquate oral function and poor quality of life[1,2]. Generally the socket of the tooth where it has been pulled out, is filled with coagulated blood. In a few days the granular and fibrous tissues are organized to form bone tissue gradually. An extensive remodel is produced where it decreases in height as mush as in wide[3].

Nowadays with the development of science, there has been an increase of the materials dedicated to rehabilitate bone tissue [4-10], providing other alternatives to prevent the MMAA, being an useful option[11,12] to promote the scaring and minimizing the loss of bone quantity.

One of the techniques applied is the alveolar filling with hydroxyapatite (HAP) granulated which maintain the height and wide of the bone tissue.

In this work we check the effectiveness of the combined use of Apafill-G and Tisuacryl, the former to maintenance of the height of the ridge and the latter to help in the sealing of the oral mucous in dental extractions.

The efficacy of APAFILL-G as filler to prevent the resorption of alveolar bone after tooth extraction has been demonstrated.

Materials and Methods

Dense synthetic hydroxyapatite granules Apafill-G™ of irregular shape, with a grain size between 0.4-0.6 mm. The Tisuacryl™ is a tissue adhesive composed of n-butyl cyanocrylate. Both products were manufactured in the Centro de Biomateriales de la Universidad de La Habana.

The population included in this work was constituted by 33 patients. They attended in the Clínica Estomatológica Docente de Bauta. The subjects were between 18 and 70 years old. General state of health was classified in the categories 0 and 1, according to the World Health Organization. The extractions were carry out using the conventional method. Previous filling of the sockets with Apafill-G™, the *toilette* of the site was realized. The Apafill-G™ was mixed with sterile water or blood's patient. This paste was putting in small amounts, pressing gently and covering the hydroxyapatite with a fibrin mesh to prevent particle migration[11]. Finally, Tisuacryl was applied to achieve hermetic sealing, in order to substitute suture.

The follow-up was carried out clinically and radiographically. Clinically the some variables such as edema, infection and pain were evaluated. The presence of edema was considered slight when a small or medium increase of volume was visualized and severe when a marked increase of volume of the mucous was noticed. The infection was evaluated for the appearance or not of suppuration. The pain in slight and severe according to the patient's reference. Radiographically, the radiopacity associated with the granules was evaluated seven days and six months after the implantation.

The evaluation of the patient was categorized as **satisfactory** or **not satisfactory.**

Satisfactory: radiographically, more than 80% of filling keeps in the socket and there was no infection, edema or pain.

Not satisfactory: radiographically less than 80 % of the filling was observed, at least in the area. There was edema, infection and pain.

Results and Discussion

Table 1. Clinical and radiographic response after seven days.

Evaluation	Patients	
	Quantity	%
Satisfactory	32	96.9
Not Satisfactory	1	3.03
TOTAL	33	100

The Table 1 shows the positive response in 96.9 % of the cases because one patient presented edema and pain. There was no bleeding, infection or presence of dental plaque in any of the cases.

Radiographically, between seven days and six month 100 percent of the patients were categorized as satisfactory (more than 80 % of filling keeps in the site).

After seven days the radiopacity associated with the Apafill-G™ granules was well delimited by a border radiolucent similar to normal adjacent bone but the granules could be stilled distinguished. No regression of clinical symptoms was detected at six moths clinical exam.

Table 2. Clinical and radiographic response after six months

Evaluation	Patients	
	Quantity	%
Satisfactory	33	100
Not Satisfactory	0	0
TOTAL	33	100

After 6 moths, the radiolucent border disappeared but the granules were radiographically detected inside of the implanted site. After one year no difference in optical density between the implanted site and surrounding normal bone could be observed in the radiograph picture.

Table 3. Final evaluation of the treament with Apafill-G™.

Evaluation	Seven days		Six months		One years	
	Quantity	%	Quantity	%	Quantity	%
Satisfactory	32	96,9	33	100	33	100
Not Satisfactory	1	3,1	0	0	0	0
TOTAL	33	100	33	100	33	100

The final evaluation of the treatment with Apafill-G™ (Table 3) reflected 100 % of efficacy in the application of this technique to prevent the Atrophy of the Alveolar Ridge. After one year, the 100 percent of the cases were evaluated as satisfactory because the Apafill-G™ keeps in the implanted site well integrated with the surrounding normal bone tissue; also no evidence for implant resorption was detected.

The results obtained in this work are similar to those obtained by other authors. For instance Boyne[13] who filling dental sockets with Bio-Oss in preclinical and clinical and reported satisfactory results.

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