



Working together  
www.rcis.ro

## **Revista de cercetare și intervenție socială**

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)

Selected by coverage in Social Sciences Citation Index, ISI databases

---

### **QUALITY OF LIFE AFTER USING OF PLATELET RICH FIBRIN (PRF) IN PATIENTS WITH ALVEOLOPLASTIC EXTRACTION**

*Mihaela DIMOFTE, Joseph CHOUKROUN, Mihaela MOSCALU, Eugenia POPESCU*

Revista de cercetare și intervenție socială, 2016, vol. 55, pp. 31-46

The online version of this article can be found at:

*www.rcis.ro, www.doaj.org and www.scopus.com*

---

Published by:

Expert Projects Publishing House



On behalf of:

„Alexandru Ioan Cuza” University,

Department of Sociology and Social Work

and

Holt Romania Foundation

REVISTA DE CERCETARE SI INTERVENTIE SOCIALA

is indexed by ISI Thomson Reuters - Social Sciences Citation Index

(Sociology and Social Work Domains)



# Quality of Life after using of Platelet Rich Fibrin (PRF) in Patients with Alveoloplastic Extraction

Mihaela DIMOFTE<sup>1</sup>, Joseph CHOUKROUN<sup>2</sup>,  
Mihaela MOSCALU<sup>3</sup>, Eugenia POPESCU<sup>4</sup>

## Abstract

The social impact and the patients' quality of life, in regard with their oral health status, show important alterations during the immediately post-surgery period, after alveoloplastic extractions. Alveoloplastic extraction is a usual surgical dental-alveolar procedure. Depending on the number of extracted teeth, their location, duration of procedure, or difficulty, the following post-surgery symptoms may occur: pain at various intensities, insomnia, local swelling, difficulty eating, speaking, symptoms that are affecting the patient's life more intensely in the first three days after surgery. The study aims to evaluate the effects of PRF in the healing of post extraction wounds in the case of alveoloplastic extractions, by reducing the patient's pain and discomfort in the immediate postoperative period, until the removal of suture threads. Oral diseases and disorders can affect the individuals' physical and psycho-social state, thus leading to a negative perception of the oral health, which is susceptible to deteriorate the patients' general quality of life (QoL). Study results showed that the use of PRF for rapid wound healing after alveoloplastic extraction can be beneficial in improving the quality of life of individuals.

*Keywords:* quality of life, platelet-rich fibrin, tooth extraction, alveoloplastic extraction, OHIP-14.

---

<sup>1</sup> University of Medicine and Pharmacy "Grigore T. Popa" Iasi, Department of Dentoalveolar and Maxillofacial Surgery, Faculty of Dental Medicine, ROMANIA. E-mail: mihaela031186@yahoo.com

<sup>2</sup> Pain Therapy Center, Nice, FRANCE. E-mail: joseph@a-prf.com

<sup>3</sup> University of Medicine and Pharmacy "Grigore T. Popa" Iasi, Preventive Medicine and Interdisciplinary Department, Iasi, ROMANIA. e-mail: mmoscalu@yahoo.com (corresponding author)

<sup>4</sup> University of Medicine and Pharmacy "Grigore T. Popa" Iasi, Department of Dentoalveolar and Maxillofacial Surgery, Faculty of Dental Medicine, ROMANIA. E-mail: jenyropescu@yahoo.com

## Introduction

The social impact of oral health is an integral part of overall health which is essential for a person's welfare and quality of life, measured in terms of psychosocial and economic aspects. Oral symptoms and their effects on the patients' state are leading to major social impacts specific for oral diseases. Diet, nutrition, sleep, psychological status, social interaction, school and work are all affected by oral health disorders. Oral diseases and conditions or craniofacial conditions are leading to the alteration of the ability to bite, chew and swallow food, which causes limitations in the food selection process and, consequently, result in a poor nutrition. These conditions include also tooth loss, diminished salivary functions, orofacial pain and functional limitations caused by dentures. Orofacial pain as a symptom of dental and oral problems is a major cause for the decreasing of life quality.

These oral health issues are associated with sleep deprivation and depression, with multiple psychosocial negative implications. More than any other part of the body, the human face bears the stamp of individual identity. The attractiveness has a significant effect on psychological development and social relations. Given the importance of mouth and teeth in verbal and non-verbal communication, the diseases that can disrupt their functions are likely to affect an individual's self-image and to alter the ability to build and maintain social relationships.

The individuals' social functions comprise a variety of roles, from intimate interpersonal contacts, to the involvement in social and community activities, including, by example, the filling for a job. Oral health can significantly interfere with these social issues at all levels. Due to social frustration or functional problems, people with oral diseases generally avoid conversation or laughter, smiling, or other nonverbal expressions which may show their teeth and mouth. The social impact of oral health on overall health and quality of life is particularly pronounced in adults.

Moreover, poor oral health can increase overall health risks by altering the chewing performance and, hence, compromising the quality of nutrition (the decreasing of food choice is altering the general nutrition status). Many of the associated diseases (heart conditions, chronic respiratory diseases, kidney disorders or mental disorders), systemic diseases and / or adverse side effects of their treatments and also the high prevalence of medication therapies in adults, may all deteriorate oral health. These factors may result in an increased risk of oral conditions, reduced salivary flow, altered senses of taste and smell, orofacial pains, gingival super infection, alveolar bone resorption and tooth mobility. In addition, oral health may still be compromised as a result of improper oral hygiene. Pain, dental abscesses, chewing problems, missing or damaged teeth, all may

adversely affect everyday life, self-esteem and well-being of adults (Petersen & Yamamoto, 2005).

The World Health Organization, in 1994, defined the Quality of Life (QoL) as an individual's perception of his/her position within the cultural context and value system in which he/she is living, compared to all social goals, expectations, parameters and relations (The WHOQOL Group, 1994).

This is a broad concept (QoL) and is affected by a person's physical health, psychological state, socioeconomic status, access to health services and education, and other factors. The concept of QoL is closely related to the individual's health. Daily quality of life, including a person's general health, comprises important dimensions that should be assessed during diagnosis, interventions and treatment procedures (Riordain & McCreary, 2010). Alveoloplastic extraction is a surgical usual dental-alveolar procedure. Depending on the number of extracted teeth, their location, duration of procedure, or difficulty, the following post-surgery symptoms may occur: pain at various intensities, insomnia, local swelling, difficulty eating, speaking, symptoms that are affecting the patient's life more intensely in the first three days after surgery. The study aims to evaluate the effects of PRF in the healing of post extraction wounds in the case of alveoloplastic extractions, by reducing the patient's pain and discomfort in the immediate postoperative period, until the removal of suture threads.

### **Research methodology**

A prospective study was conducted on the quality of life of patients who underwent alveoloplastic extractions. In the study there were included 100 patients who were divided into two groups: the study group (50 cases) and the control group (50 cases). The study group included patients who underwent alveoloplastic extraction which included the applying of platelet rich fibrin (PRF) on extraction area and subsequent suture, while patients in the control group were patients with alveoloplastic extraction followed by suturing. The surgical procedure was the same for all patients and was carried out by a resident under the supervision of a specialist. Patients were explained the procedure details and its implications. Patients who agreed to be involved in the study subsequently signed a consent paper. The study was approved by the Ethics Committee of the "Grigore T. Popa" University of Medicine and Pharmacy of Iasi.

All patients received the OHIP-14 evaluation questionnaire OHIP-14, which is a standardized questionnaire that measures people's perceptions on the impact brought by various oral disorders on the quality of life (Slade & Spencer, 1994) and were asked to score the answers on a scale of 5 points. OHIP-14 structured questionnaire included information on relevant socio-demographic characteristics

and other data, including age, sex, education, occupation, marital status, smoking status (smoker/non-smoker) and previous visits to the dentist practitioner's office in the last 6 months. Participants were also asked to state if they ever received a diagnosis of systemic diseases. In order to assess the impact of alveoloplastic extraction in the two study groups, the OHIP-14 was applied before surgery and post-surgery, 7 days after extraction.

This questionnaire contained 14 questions divided into seven domains: functional limitation (e.g.: difficulty of chewing), physical pain (e.g. toothache), psychological discomfort (e.g. the awareness of poor oral status), physical disability (e.g. avoidance of certain foods due to oral problem), psychological disability (e.g. affected power of concentration), social disability (e.g. being less tolerant toward others due to oral problem) and handicap (e.g. inability of patient to do what he/she wants) (Table 1).

Table 1. Codification of the questionnaire items OHIP-14

Subscale OHIP-14	Codification	Items OHIP-14
Functional limitation	I1	Had trouble pronouncing words
	I2	Felt that sense of taste had worsened
Physical pain	I3	Had painful aching in mouth
	I4	Was uncomfortable when eating foods
Psychological discomfort	I5	Has been feeling self-conscious
	I6	Has felt tense
Physical disability	I7	Diet has been unsatisfactory
	I8	Has had to interrupt meals
Psychological disability	I9	Finds it difficult to relax
	I10	Has been a bit embarrassed
Social disability	I11	Has been irritable with other people
	I12	Has had difficulty during usual jobs
Handicap	I13	Has found life less satisfying
	I14	Has been totally unable to function

Answers at every item have been given in compliance to a Likert type scale, these being codified as: 0-never, 1-very rarely, 2-occasionally, 3-often and 4-very often. The greatest advantage of this indicator is its capability to assess not only individuals but also groups, and measures the degree in which the impairment of oral health can affect someone's daily life (Slade & Spencer, 1994; Slade, 1997). The final score has been obtained by accumulating the answer codes for the 14 items. Hence, the OHIP-14 scale varied within the range 0-56, and the high scores were revealing a deterioration of quality of life (Oral Health Related Quality of Life - OHR-QoL).

The OHIP-14 score allowed us to classify patients into four categories: not at all affected (Score 0-14), a little affected (Score 15-28), quite a lot affected (Score 29-42) and very much affected (Score 43-56). Categories 1 and 2 were considered as "Not affected" (Score 0-28), and categories 3 and 4 considered as "Affected" (Score 29-56).

### ***Statistical Analysis***

Data were analysed using the SPSS V.22 - SPSS Inc., IBM Corporation, Chicago, IL, USA). The results of the univariate analysis were reported as mean  $\pm$  standard deviation for continuous variables. Total count and percent were reported for categorical variables. Chi-square test was performed for categorical variables and Mann–Whitney test, Kruskal-Wallis test or Student's t test performed for continuous variables (Antoniou *et al.*, 2016). Associations of selected variables with the outcomes were assessed with Chi-square tests and Fisher exact tests.

The association between the independent variables and the dependent variables (OHIP-14 scores) was analysed by means of the multiple linear regression.

The significance level (p-value), which represents the maximum error probability, was considered to be 0.05 (5%), a confidence interval of 95% showing that the decision is correct.

## **Results**

The results of the study have shown the socio-demographic and clinical characteristics of patients from the two analysed groups. Also, there was achieved a comparative presentation of quality of life that was evaluated on the basis of the OHIP-14 questionnaire before and after an alveoloplastic extraction. A surveyed factor was the way the patients' quality of life was affected after an alveoloplastic extraction followed by application of platelet rich fibrin (PRF), compared to those that underwent alveoloplastic extractions followed only by sutures.

The patients' ages range varied between a minimum of 18 and a maximum of 65, with mean values of  $34.7 \pm 12.91$ SD years in the study group and  $31.2 \pm 11.45$ SD years in the control group. Between the two groups there were no significant differences in terms of sex, native social environment, education level, profession and marital status (*Table 2*).

The patients' clinical characteristics were compared and the results showed no significant differences (*Table 3*). In terms of frequency of visits to the dental practitioner, it was noted that in the study group only 8% of patients were regularly visiting a dentist's cabinet, while in the control group 26% of patients went regularly to the dentist ( $p = 0.0238$  95% CI).

Table 2. Sociodemographic characteristics of patients in the groups studied

Characteristics of the participants	study group † n = 50	control group † n= 50	p-value‡ (95%CI)
Age (years)	34.7 ± 12.91	31.25 ± 11.45	p=0.2862 (NS)
Gender			
Male	19 (38%)	28 (56%)	p=0.0713 (NS)
Female	31 (62%)	22 (44%)	
Environment			
Rural	11 (22%)	16 (32%)	p=0.2624 (NS)
Urban	39 (78%)	34 (68%)	
Education			
Elementary school	1 (2%)	5 (10%)	p=0.0811 (NS)
High school	12 (24%)	17 (34%)	
University student	6 (12%)	2 (4%)	
University degree	31 (62%)	26 (52%)	
Occupation			
Employee	29 (58%)	24 (48%)	p=0.5819 (NS)
Unemployed	3 (6%)	15 (30%)	
Student	9 (18%)	1 (2%)	
Retired	9 (18%)	10 (20%)	
Marital status			
Single	17 (34%)	14 (28%)	p=0.3571 (NS)
Married	22 (44%)	31 (62%)	
Separated or divorced	11 (22%)	5 (10%)	
† Values were expressed as number (%) mean ± SD, or percent at%; NS, not significant; SS statistically significant			
‡ Student's t-test, ANOVA, Kruskal-Wallis; Chi-square test or Fisher's exact test.			

Table 3. Clinical characteristics and other relevant aspects of patient groups studied

Clinical characteristics	study group † n = 50	control group † n= 50	p-value‡ (95%CI)
Smoking			
Yes	19 (38%)	22 (44%)	p=0.5418 (NS)
No	31 (62%)	28 (56%)	
Systemic Diseases			
Yes	27 (54%)	24 (48%)	p=0.5484 (NS)
No	23 (46%)	26 (52%)	
Other oral disease			
Dental decay	44 (88%)	42 (84%)	p=0.5971 (NS)
Edentation	34 (68%)	24 (48%)	
Periodontitis	48 (96%)	39 (78%)	
Frequency of dental visits			
Regular	4 (8%)	13 (26%)	p=0.0238 (SS)
Irregular	22 (44%)	18 (36%)	
For pain	24 (48%)	19 (38%)	
Assessment of oral health status			
Poor	15 (30%)	11 (22%)	p=0.2441 (NS)
Fair	21 (42%)	20 (40%)	
Good / excellent	14 (28%)	19 (38%)	
† Values were expressed as number (%) or percent at%; NS, not significant; SS statistically significant			
‡ Chi-square test or Fisher's exact test.			

The punctual answers to all items within the OHIP-14 were compared and presented, before and post extraction procedure, for both study groups (Table 4).

Table 4. OHIP-14 questionnaire items and answers received in each field

OHIP-14	group study / group control - BEFORE THE PROCEDURE n(%)				
	never	hardly ever	occasionally	fairly often	very often
<b>I1</b>	0(0%) / 4(8%) 1(2%) / 3(6%)	12(24%) / 17(34%) 15(30%) / 16(32%)	21(42%) / 19(38%) 23(46%) / 24(48%)	11(22%) / 8(16%) 6(12%) / 4(8%)	6(12%) / 2(4%) 5(10%) / 3(6%)
<b>I2</b>	0(0%) / 7(14%) 2(4%) / 5(10%)	15(30%) / 19(38%) 17(34%) / 19(38%)	17(34%) / 14(28%) 18(36%) / 19(38%)	13(26%) / 9(18%) 11(22%) / 6(12%)	5(10%) / 1(2%) 2(4%) / 1(2%)
<b>I3</b>	0(0%) / 5(10%) 0(0%) / 2(4%)	11(22%) / 17(34%) 14(28%) / 15(30%)	21(42%) / 18(36%) 23(46%) / 25(50%)	11(22%) / 7(14%) 9(18%) / 7(14%)	7(14%) / 3(6%) 4(8%) / 1(2%)
<b>I4</b>	0(0%) / 6(12%) 1(2%) / 4(8%)	7(14%) / 16(32%) 9(18%) / 10(20%)	26(52%) / 21(42%) 28(56%) / 29(58%)	9(18%) / 4(8%) 8(16%) / 5(10%)	8(16%) / 3(6%) 4(8%) / 2(4%)
<b>I5</b>	0(0%) / 1(2%) 2(4%) / 3(6%)	12(24%) / 18(36%) 16(32%) / 18(36%)	23(46%) / 20(40%) 21(42%) / 22(44%)	12(24%) / 9(18%) 9(18%) / 5(10%)	3(6%) / 2(4%) 2(4%) / 2(4%)
<b>I6</b>	0(0%) / 6(12%) 3(6%) / 4(8%)	8(16%) / 19(38%) 13(26%) / 14(28%)	12(24%) / 8(16%) 9(38%) / 21(42%)	14(28%) / 9(18%) 9(18%) / 8(16%)	16(32%) / 8(16%) 6(12%) / 3(6%)
<b>I7</b>	0(0%) / 1(2%) 3(6%) / 4(8%)	9(18%) / 16(32%) 13(26%) / 15(30%)	17(34%) / 15(30%) 19(38%) / 20(40%)	15(30%) / 13(26%) 11(22%) / 9(18%)	9(18%) / 5(10%) 4(8%) / 2(4%)
<b>I8</b>	0(0%) / 11(22%) 1(2%) / 2(4%)	8(16%) / 18(36%) 11(22%) / 13(26%)	12(24%) / 10(20%) 17(34%) / 18(36%)	23(46%) / 9(18%) 19(38%) / 16(32%)	7(14%) / 2(4%) 2(4%) / 1(2%)
<b>I9</b>	0(0%) / 17(34%) 3(6%) / 4(8%)	14(28%) / 15(30%) 19(38%) / 21(42%)	15(30%) / 11(22%) 18(36%) / 19(38%)	13(26%) / 6(12%) 8(16%) / 5(10%)	8(16%) / 1(2%) 2(4%) / 1(2%)
<b>I10</b>	0(0%) / 1(2%) 3(6%) / 3(6%)	12(24%) / 21(42%) 15(30%) / 17(34%)	9(18%) / 15(30%) 15(30%) / 15(30%)	20(40%) / 10(20%) 11(22%) / 11(22%)	9(18%) / 3(6%) 6(12%) / 4(8%)
<b>I11</b>	0(0%) / 8(16%) 3(6%) / 4(8%)	5(10%) / 14(28%) 7(14%) / 9(18%)	8(16%) / 16(32%) 10(20%) / 9(18%)	26(52%) / 7(14%) 22(44%) / 22(44%)	11(22%) / 5(10%) 8(16%) / 6(12%)
<b>I12</b>	0(0%) / 7(14%) 0(0%) / 1(2%)	10(20%) / 16(32%) 11(22%) / 12(24%)	19(38%) / 17(34%) 21(42%) / 22(44%)	18(36%) / 10(20%) 16(32%) / 15(30%)	3(6%) / 0(0%) 2(4%) / 0(0%)
<b>I13</b>	0(0%) / 6(12%) 2(4%) / 2(4%)	18(36%) / 27(54%) 19(38%) / 20(40%)	12(24%) / 11(22%) 13(26%) / 16(32%)	11(22%) / 5(10%) 9(18%) / 8(16%)	9(18%) / 1(2%) 7(14%) / 4(8%)
<b>I14</b>	0(0%) / 12(24%) 3(6%) / 4(8%)	13(26%) / 21(42%) 14(28%) / 16(32%)	19(38%) / 14(28%) 21(42%) / 22(44%)	17(34%) / 3(6%) 11(22%) / 8(16%)	1(2%) / 0(0%) 1(2%) / 0(0%)

Based on the summed score (OHIP-14 ADD) the level of impairment of quality of life was assessed. Thus, it was noted that within the study group, after alveoloplastic extractions followed by PRF application, the impairment degree significantly decreased ( $\chi^2 = 12.71787$ ,  $p = 0.00529$ ). Before extraction, only 10% of cases within the study group declared that they are not affected; post extraction, their frequency increased to 34%. Moreover, there was a significant drop in the number of cases which had an important impairment before extraction (30% vs 10%). In the case of alveoloplastic extractions not followed by PRF no significant changes in quality of life were noted ( $\chi^2 = 0.7026$ ,  $p = 0.87258$ ).



Table 5. Level of quality of life impairment, in compliance to OHIP-14

	OHIP-14 ADD	Not at all affected (Score 0-14) n(%)	A little affected (Score 15-28) n(%)	Quite a lot affected (Score 29-42) n(%)	Very much affected (Score 43-56) n(%)
Study group	before the procedure	5 / 10%	13 / 26.00%	17 / 34%	15 / 30%
	after the procedure	17 / 34%	16 / 32.00%	12 / 24%	5 / 10%
	Chi-square test	$\chi^2=12.71787$ , df=3, p=0.00529, 95%CI			
Control group	before the procedure	10 / 20%	12 / 24%	20 / 40%	8 / 16%
	after the procedure	13 / 26%	12 / 24%	19 / 38%	6 / 12%
	Chi-square test	$\chi^2=0.7026$ , df=3, p=0.87258, 95%CI			

The quantitative evaluation of OHIP-14 scores revealed the same results. Thus, the mean score values were significantly lesser after alveoloplastic extractions followed by PRF application ( $33.3 \pm 12.8SD$  vs  $22.9 \pm 13.7SD$ ,  $H_{Kruskal-Wallis} = 14.2$ ,  $p=0.002$ ), which was the proof that an improvement of the patients' welfare occurred. In the case of alveoloplastic extractions not followed by PRF application the modifications were not significant ( $28.4 \pm 13SD$  vs  $25.7 \pm 12.3SD$ ,  $H_{Kruskal-Wallis} = 0.978$ ,  $p=0.322$ ) (Table 6, Figure 1).

Table 6. Comparison of Mean OHIP-14 Scores

	OHIP-14 ADD	OHIP-14 score Means (95%CI)	Std.Dev.	Q25	Median	Q75
Study group	before the procedure	33.3(29.6-36.9)	12.8	24.0	32.0	43.0
	after the procedure	22.9(19-26.8)	13.7	13.0	22.5	31.0
Control group	before the procedure	28.4(24.8-32.1)	13.0	18.0	29.0	37.0
	after the procedure	25.7(22.2-29.2)	12.3	14.0	28.5	32.0

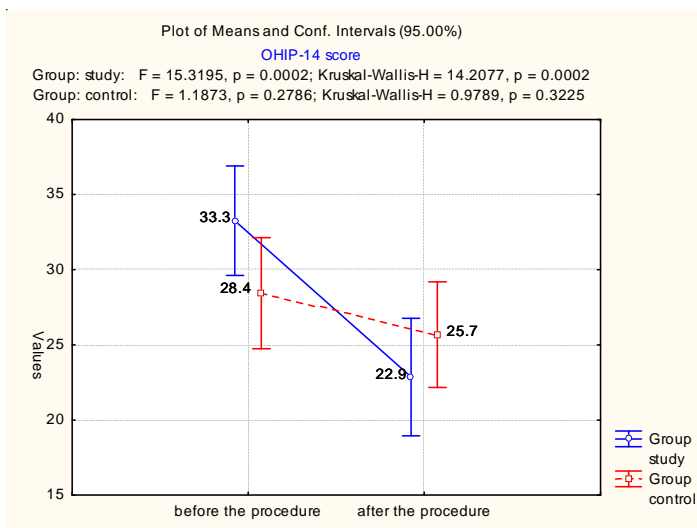


Figure 1. The mean OHIP-14 Scores (95%CI)

In order to identify socio-demographic and clinical factors that may influence the patients' quality of life, expressed by OHIP-14 score, a multivariate analysis was conducted, being based on linear regression. The analysis considered independent variables (covariates) as age, sex, origin, education, occupation, marital status, presence of systemic disease, the presence of oral disease and oral health.

The multivariate analysis allowed the achievement of a model able to define the significant predictive factors that may influence the OHIP-14 score in patients with alveoloplastic extraction followed by local PRF application. Into study there were taken the OHIP-14 score values recorded before the intervention. The modelling can have a single step, in which all covariates are included at the same time, or may be performed stepwise, by gradually including a number of predictors, or by gradually excluding some of them. In the conducted study the "ENTER" method was used, a method in which independent factors were included in a single step.

Table 7. Multiple linear regression method - effect of independent variables on the OHIP-14 score in patients from the study group

Model <sup>a</sup> Predictors	Unstandardized Coefficients		Standardized Coefficients	t	p-Sig. level
	B	Std. Error	Beta		
Age	-4.314	0.126	-0.338	-3.606	<b>.000</b>
Gender	0.260	0.374	0.041	0.670	.504
Environment	.419	0.351	0.069	1.192	.234
Education	2.963	0.246	0.397	2.575	<b>.037</b>
Occupation	3.073	1.356	0.350	2.791	<b>.012</b>
Marital status	2.764	1.964	0.251	2.528	<b>.029</b>
Systemic Diseases	2.656	0.758	0.032	0.558	.577
Other oral disease	5.115	1.352	0.139	3.421	<b>.016</b>
Assessment of oral health status	3.457	0.913	0.421	2.968	<b>.000</b>
<i>a. Dependent Variable: score OHIP-14</i> <i>R=0.438, R<sup>2</sup>=0.192, p&lt;&lt;0.01</i>					

The results obtained from the multiple linear regression method using the OHIP-14 as the dependent variable are shown in Table VII. The effect of independent variables on the patient's quality of life has been described by means of the amount of non-standardized B coefficients, the standardized Beta coefficients and the value of the corresponding level of significance. Thus, it was shown that age is an important factor that is influencing the OHIP-14 score, younger patients showing scores that were significantly higher ( $\beta = -0.338$ ,  $p \ll 0.01$ ), therefore an important perception of impairment of their quality of life.

Moreover, education ( $\beta = 0.397$ ,  $p = 0.037$ ), occupation ( $\beta = 0.35$ ,  $p = 0.012$ ), the marital status ( $\beta = 0.251$ ,  $p = 0.029$ ), the presence of oral diseases ( $\beta = 0.139$ ,  $p = 0.016$ ) and the oral health state ( $\beta = 0.421$ ,  $p \ll 0.01$ ) were factors that were contributing to the decreasing of quality of life in patients that underwent alveoloplastic extraction followed by PRF application.

The association of the independent variables with the OHIP-14 score was expressed in the regression model previously described by the determination coefficient (R<sup>2</sup>). The result indicated that in 19.2% of cases the variation of the OHIP-14 score are explained by the independent variables which had a significant association within the multiple linear analysis.

## Discussion

The healing process after tooth extraction, particularly in the mandible, is a complex issue that includes some physiological episodes (Mahmoud Hashemi, *et al.*, 2015), pain, oedema and alveolar osteitis being the most commonly seen complications after extractions (Deodhar & Rana, 1997; Mantovani *et al.*, 2014).

The PRF is defined as a second generation platelet concentrate that contains great amounts of platelets, leukocytes, cytokines and circulating stem cells. Hence, its structure helps to improve the wounds healing process (Dohan *et al.*, 2006; Choukroun *et al.*, 2006).

The aim of this study is to quantify the quality of life in patients with oral disease depending on treatment, and focusing on the effect of PRF applications after alveoloplastic extractions.

The results regarding the psycho-social issues addressed in the OHIP-14 questionnaire, in relation to both treatment type and degree of impairment of patients' oral health, have highlighted the importance of improving therapy methods in order to increase the patients' quality of life, which is significantly impaired.

Using PRF in alveoloplastic extractions has significantly reduced the post-surgery pain and also reduced functional limitations (pronunciation of words, sense of taste). Although these are subjective aspects, the decreasing of pain intensity or the post-surgery analgesic consumption were also described by other studies which were showing a healing time that was significantly shorter when using PRF application after dental extractions (Marenzi *et al.*, 2014; Kumar *et al.*, 2015).

Simonpieri and his collaborators also reported that PRF application is able to decrease pain and swelling after oral surgical procedures and are limiting the minor infectious phenomena. These authors also suggested that leukocytes and cytokines present in the PRF structure play an important role in the prevention of infection and inflammation (Simonpieri *et al.*, 2009)

Our hypothesis was that the application of PRF is significantly improving the patient's post-surgery comfort. In medical textbooks the PRF clinical effects on the healing of post-extraction wounds are debatable (Hagglin *et al.*, 2007).

Montero and his collaborators have noticed higher scores for those items in the OHIP-14 questionnaire that are related to pain and psychological distress after dental extractions (Montero *et al.*, 2011). Analysis of the association between perceived quality of life in patients from the study groups analysed by gender, origin environment and the presence of systemic disease is showing significant correlations, issue that is not confirmed by all studies. In one study it was noted that female patients feature a mean OHIP-14 score being 7.61 times higher compared with male patients (Rusanen *et al.*, 2012).

In terms of age, medical textbooks mention that after the age of 61 patients start to have a better perception upon quality of life. But the perception of quality of life based on oral health should be compared at the level of the intra-group's age, because there are significant differences that might significantly influence the results (Bernabe & Marcenes, 2010; Herce Lopez *et al.*, 2009). In the same way, authors as Stenman and his collaborators show that older patients are stating a decreased perception of quality of life, issue that is tightly related to all physiological alterations brought by age (Stenman *et al.*, 2012).

Considering the importance of general health and oral health as multidimensional concepts and as key factors in QoL, the patient's point of view was considered to be very important (Cunha-Cruz *et al.*, 2007). Using subjective measuring instruments has become increasingly important in assessing general and oral health (Kieffer & Hoogstraten, 2008). In order to assess the implications of oral health on the quality of life (oral health related quality of life - OHR-QoL), certain instruments have been developed for the evaluation of the functional, psychological and social effects of dental diseases (Riordain *et al.*, 2011; Striner & Norman, 2008).

Oral diseases and disorders can affect the individuals' physical and psychosocial state, fact that leads to a negative perception of the oral health, which is susceptible to deteriorate the general quality of life in patients (QoL) (Locker & Gibson, 2005). Studies carried out worldwide have evaluated the oral health related QoL in the context of general population (Sanders *et al.*, 2009). During the last years, many studies evaluated the impact of oral diseases upon the OHR-QoL factor, in specific conditions, such as: temporomandibular disorders, parodontal disease, stomatological diseases, oral cancer, HIV associated lesions (Andrade *et al.*, 2006; Yengopal & Naidoo, 2008; Barros *et al.*, 2009). Most of these studies revealed the fact that there is a tight OHR- QoL factor connection (John *et al.*, 2007).

When assessing the impact of dental disease on OHR-QoL it was demonstrated that patients suffering from oral diseases reported a little influence on the QoL-OHR factor and the presence of the dental disease was associated with higher levels of impairment related to functional limitation, physical pain and psy-

chological discomfort compared to the general population (Llewellyn & Warnakulasuriya, 2003).

The impact of oral health on quality of life is a subjective concept, but can be considered an important dimension which must be assessed during diagnosis, intervention and dental procedures carried out during treatment. The OHIP (Oral Health Impact Profile), in both forms, the long form (OHIP-49) and the short one (OHIP-14), is one of the most used instrument for assessing the impact of various oral disorders on the quality of life. This was developed by Slade and Spencer in 1994 and includes seven dimensions, which are based on the Locker theoretical model of oral health (Slade & Spencer, 1994; Slade, 1997).

The dimensions are: functional limitation, physical pain, psychological discomfort, physical disability, mental disability, social disability and handicap. These dimensions are hierarchically ordered in order to capture the results that have an increasing disruptive impact on people's lives (Slade, 1997). This study presents the results in terms of social impact and quality of patients' lives in the immediate postoperative period after an alveoloplastic extraction by means of application of platelet-rich fibrin (Platelet Rich fibrin - PRF).

### ***Platelet Rich Fibrin (PRF) in patients with alveoloplastic extraction***

The treatment methods for various periodontal disorders have shown a remarkable evolution in recent years. Development of bioactive surgical additives in order to reduce inflammation and for speeding up the healing process is one of the biggest challenges in the field of dentistry. Recently, a particular attention was paid to the use of platelet rich fibrin (PRF) to treat periodontal disease. Platelet-rich fibrin (PRF) developed in France by Choukroun and his collaborators are a second-generation of platelet concentrate, widely used to accelerate the healing of soft and hard tissue. Being used in oral maxillofacial surgery, it features major implications in healing process, in bone augmentation process, in angio-genesis and in periodontal surgery (Choukroun *et al.*, 2001).

Platelet-rich fibrin (a fibrin rich in platelets) (PRF) is an autologous matrix of fibrin rich in platelets and growth factors, obtained from a patient's blood sample collected during the surgical procedure which features a high immunological value. PRF alone or in combination with other biomaterials are an alternative with favourable results and low risk, which shows a number of advantages and indications for the medical and dentistry sectors, being a minimally invasive technique with outstanding clinical results (Borie *et al.*, 2015).

PRF involves a simplified processing compared to other thrombocytes concentrates. The PRF production protocol tries to accumulate thrombocytes a cytokines released in fibrin clot (Marx *et al.*, 1998; Weibrich *et al.*, 2003). Although leukocyte cytokines and thrombocytes play a key role in the biology of these

biomaterials, the fibrin matrix is the determining element which is directly responsible for the PRF's actual therapeutic potential (Choukroun *et al.*, 2001; Dohan *et al.*, 2006). More recently, Gassling and his collaborators have shown that PRF is an adequate backbone for the „in vitro” growth of human periosteal cells, which can be used in bone tissue engineering (Gassling *et al.*, 2010). Autologous fibrin platelets rich in thrombocytes (PRF), are considered to be a healing bio-material which has been firstly used in oral implantology. Nowadays studies demonstrated their application in domains of oral health (Aroca *et al.*, 2009; Balaram *et al.*, 2013.)

### Conclusion

The study's results have shown that from the 64% of patients who underwent alveoloplastic extractions followed by PRF application and which were presenting a significant post-surgery impairment of life quality, their rate decreased significantly to 34%. In the control group the decreasing of number of cases that have reported a post-surgery impairment of quality of life changed in an insignificant way, from 56% to 50%. These results have demonstrated that the use of PRF after alveoloplastic extraction significantly improves the post-surgery life quality in patients, while in the case of alveoloplastic extractions followed only by suture such improvement was not significant.

Another important aspect that was demonstrated in the multivariate analysis is the fact that younger patients are significantly more affected by oral symptoms and diseases. Also, the presence of other oral diseases, the oral health status, the occupation, the education level and the marital status have all major social impacts, these issues significantly contributing to the deterioration of quality of life. The conclusions of our study demonstrates that the use of PRF in alveoloplastic extraction, by a quick healing of wounds and by decreasing the risk of complications brings major benefits for both doctor and patient.

### References

- Andrade, F.B., Antunes, J.L.F., & Durazzo, M.D. (2006). Evaluation of the quality of life of patients with oral cancer. *Brazilian Oral Research*, 20, 290-296.
- Antoniou, S.A., Petrescu, E., Stanescu, R., Anisie, E., & Boiculescu, L. (2016). Impact of fatigue in patients with chronic obstructive pulmonary disease: results from an exploratory study. *Therapeutic Advances in Respiratory Disease*, 10(1), 26-33.
- Aroca, S., Keglevich, T., Barbieri, B., Gera, I., & Etienne, D. (2009). Clinical evaluation of a modified coronally advanced flap alone or in combination with a platelet-rich fibrin membrane for the treatment of adjacent multiple gingival recessions: a 6-month study. *Journal of Periodontology*, 80, 244-252.

- Balaram, N.J., Karunakar, P.M., Jayadev, M., & Marshal, V.R. (2013). Role of Platelet rich fibrin in wound healing: A critical review. *Journal of Conservative Dentistry*, 16(4), 284-293.
- Barros, V.M., Seraidarian, P.I., Cortes, M.S., Paula L.V. (2009). The impacts of orofacial pain on the quality of life of patients with temporomandibular disorder. *Journal of Orofacial Pain*, 23, 28-37.
- Bernabe, E., & Marcenes W. (2010). Periodontal disease and quality of life in British adults. *Journal of Clinical Periodontology*, 37, 968-972.
- Borie, E., Garcia, O.D., Orsi, I.A., Garlet, K., Weber, B., Beltran, V., & Fuentes R. (2015). Platelet-rich fibrin application in dentistry: a literature review. *International Journal of Clinical and Experimental Medicine*, 8(5), 7922-7929.
- Choukroun, J., Diss, A., Simonpieri, A., Girard, M.O., Schoeffler, C., Dohan, S.L., Dohan, A.J., Mouhyi, J., & Dohan, D.M. (2006). Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part IV: clinical effects on tissue healing; Part V: histologic evaluations of PRF effects on bone allograft maturation in sinus lift. *Oral surgery, oral medicine, oral pathology, oral radiology and endodontics*, 101(3), 56- 60.
- Cunha-Cruz, J, Hujuel, P.P., & Kressin, N.R. (2007). Oral health-related quality of life of periodontal patients. *Journal of Periodontal Research*, 42, 169-176.
- Deodhar, A.K., & Rana, R.E. (1997). Surgical physiology of wound healing: a review. *Journal of Postgraduate Medicine*, 43(2), 52-56.
- Dohanm D.M., Choukroun J., Dissm A., Dohanm S.L., Dohanm A.J., Mouhyim J., & Gogly, B. (2006). Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part I: technological concepts and evolution; Part II: platelet-related biologic features; Part III: leucocyte activation: a new feature for platelet concentrates? *Oral surgery, oral medicine, oral pathology, oral radiology and endodontics*, 101(3), 37-55.
- Gassling, V., Douglas T., Warnke, Y.A., Wiltfang, J., & Becker, S.T. (2010). Platelet-rich fibrin membranes as scaffolds for periosteal tissue engineering. *Clinical Oral Implants Research*, 21, 543-549.
- Hagglin, C., Berggren, U., Hakeberg, M., Edvardsson, A., & Eriksson, M. (2007). Evaluation of a Swedish version of the OHIP-14 among patients in general and specialist dental care. *Swedish Dental Journal*, 31(2), 91-101.
- Herce Lopez, J., Rollon Mayordomo, A., Lozano Rosado, R., Salazar Fernandez, C.I., & Gallana, S. (2009). Quality of life in long-term oral cancer survivors: a comparison with Spanish general populations norms. *Journal of Oral and Maxillofacial Surgery*, 67, 1607-1614.
- John, M.T., Reibmann, D.R., Schierz, O., Wassel, R.W. (2007). Oral health related quality of life in patients with temporomandibular disorders. *Journal of Orofacial Pain*, 21, 46-54.
- Kieffer, J.M., Hoogstraten, J. (2008). Linking oral health, general health and quality of life. *European Journal of Oral Sciences*, 116(5), 445-450.
- Kumar, N., Prasad, K., Ramanujam, L., Ranganath, J., Dexith, J., & Chauhan, A. (2015). Evaluation of treatment outcome after impacted mandibular third molar surgery with the use of autologous platelet-rich fibrin: a randomized controlled clinical study. *Journal of Oral and Maxillofacial Surgery*, 73(6), 1042-1049.



- Llewellyn, C.D., & Warnakulasuriya, S. (2003). The impact of stomatological disease on oral health-related quality of life. *European Journal of Oral Sciences*, 111, 297-304.
- Locker, D., & Gibson, B. (2005). Discrepancies between self-ratings of and satisfaction with oral health in two older adult populations. *Community Dentistry and Oral Epidemiology*, 33, 280-288.
- Mahmoud Hashemi, H., Mohammadi, F., Hasheminasab, M., Mahmoud, Hashemi, A., Zahraei, S., & Mahmoud Hashemi, T. (2015). Effect of low-concentration povidone iodine on postoperative complications after third molar surgery: a pilot split-mouth study. *Journal of Oral and Maxillofacial Surgery*, 73(1), 18-21.
- Mantovani, E., Arduino, P.G., Schierano, G., Ferrero, L., Gallezio, G., Mozzati, M., Russo, A., Scully, C., & Carossa, S. (2014). A split-mouth randomized clinical trial to evaluate the performance of piezosurgery compared with traditional technique in lower wisdom tooth removal. *Journal of Oral and Maxillofacial Surgery*, 72(10), 1890-1897.
- Marenzi, G., Riccitiello, F., Tia, M., Lauro, A., & Sammartino, G. (2014) Influence of leukocyte- and platelet-rich fibrin (L-PRF) in the healing of simple postextraction sockets: a split-mouth study. *BioMed Research International*, 369273.
- Marx, R.E., Carlson, E.R., Eichstaedt, R.M., Schimmele, S.R., Strauss, J.E., & Georgeff, K.R. (1998). Platelet-rich plasma: Growth factor enhancement for bone grafts. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 85(6), 638-646.
- Montero, J., Lopez, J.F., Vicente, M.P., Galindo, M.P., Albaladejo, A., & Bravo M. (2011). Comparative validity of the OIDP and OHIP-14 in describing the impact of oral health on quality of life in a cross-sectional study performed in Spanish adults. *Medicina Oral, Patologia Oral y Cirugia Bucal*, 16(6), 816-821.
- Petersen, P.E., & Yamamoto, T. (2005). Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dentistry and Oral Epidemiology*, 33(2), 81-92.
- Riordain, R.N., & McCreary C. (2011). Validity and reliability of a newly developed quality of life questionnaire for patients with chronic oral mucosal diseases. *Journal of Oral Pathology & Medicine*, 40(8), 604-609.
- Riordain, R.N, & McCreary C. (2010). The use of quality of life measures in oral medicine: a review of the literature. *Oral Diseases*, 16, 419-430.
- Rusanen, J., Silvola, A.S., Tolvanen, M., Pirttiniemi, P., Lahti, S., & Sipilä K. (2012). Pathways between temporomandibular disorders, occlusal characteristics, facial pain, and oral health-related quality of life among patients with severe malocclusion. *European Journal of Orthodontics*, 34(4), 512-517.
- Sanders, A.E., Slade, G.D., Lim, S, & Reisine, S.T. (2009). Impact of oral disease on quality of life in the US and Australian populations. *Community Dentistry and Oral Epidemiology*, 37, 171-181.
- Simonpieri, A., Del Corso, M., Sammartino, G., & Dohan Ehrenfest, D.M. (2009). The relevance of Choukroun's platelet-rich fibrin and metronidazole during complex maxillary rehabilitations using bone allograft. Part I: A new grafting protocol. *Implant Dentistry*, 18(2), 102-111.



- Slade, G.D. (1997). Derivation and validation of a short-form oral health impact profile. *Community Dentistry and Oral Epidemiology*, 25(4), 284-290.
- Slade, G.D., & Spencer A.J. (1994): Development and evaluation of the Oral Health Impact Profile. *Community Dental Health*, 11, 3-11.
- Stenman, U., Ahlqwist, M., Björkelund, C., & Hakeberg, M. (2012) Oral health-related quality of life—associations with oral health and disorders in Swedish 70-year-old individuals. *Gerodontology*, 29(2), 440-446.
- Striner, D.L., & Norman, G.R. (2008). *Health measurement scales: a practical guide to their development and use*. 4th ed. New York, NY: Oxford University Press Inc.
- The WHOQOL Group. (1994). The development of the World Health Organization quality of life assessment instrument (the WHOQOL). In J. Orley and W. Kuyken (Eds) *Quality of Life Assessment: International Perspectives*. Heidelberg: Springer, pp. 41-60.
- Weibrich, G., Kleis, W.K., Buch, R., Hitzler, W.E., & Hafner, G. (2003). The Harvest Smart PReP system versus the Friadent-Schutze platelet-rich plasma kit. *Clinical Oral Implants Research*, 14, 233-239.
- Yengopal V., & Naidoo, S. (2008). Do oral lesions associated with HIV affect quality of life? *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 106, 66-73.