

# PREDICTABILITY AND COMPLICATIONS OF DENTAL IMPLANTS IN BISPHOSPHONATE TREATED PATIENTS

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## Abstract

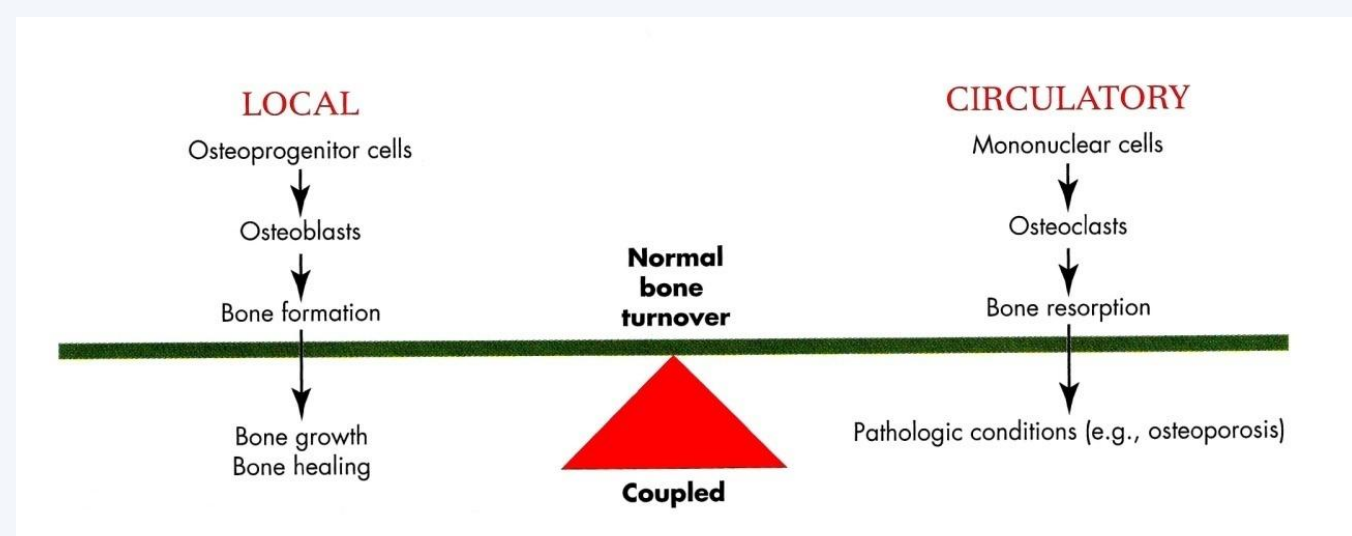
Dental implants have constantly demonstrated high cumulative success rate, so that the prosthetic approach for the edentulous patients has been enormously changed during the years.

Furthermore, because of the very high rate of predictability of dental implants, bone grafting procedures have been developed in order to enable implant therapy later on.

The quality of the patient bone, beside the quantity, and the patient healing pattern are major factors that can influence on the predictability, and on of dental implants.

BPs are commonly used in the treatment of various osteometabolic diseases including osteoporosis.

During the last decade there were multiple reports on occurrence of ONJ in patients using BPs .



**Coupling - In normal adults there is a balance between the amount of bone resorbed and the amount of bone formed.**

## Literature review of implants in BPs patients.

Authors	Year	Publication	Patients	implants	Bps Taken	Duration	Implant lost	Osteonecrosis	CSR %
Jeffcoat	2006	Int. J. Oral Maxillofac. Implants	25	102	Oral	1-4 years	None	None	100.0
Grant et al.	2008	J. Oral Maxillofac. Surg.	115	468	Oral	33 for more than 3 years	2	None	99.6
Bell et al.	2008	J. Oral Maxillofac. Surg.	42	101	Oral	6 months to 11 years	5	None	95.0
Kasai et al.	2009	J. Calif Dent. Assoc.	65		Oral	> 3 years			86.0
Shabestari	2009	Clin Implant Dent Relat Res.	21	46	Oral		None	None	100.0
Koka S. et al.	2010	J. Prosthodont Res.	82	121	Oral		1	None	99.2
Wang et al.	2007	J. Periodontology	1	5	Oral	> 10 years	1	osteonecrosis	80.0
Marks et al.	2007	J. Oral Maxillofa Surg.	2		Oral	> 3 years		osteonecrosis	
Fugazzoto	2007	J. Periodontal	61	169	Oral	3.3 years	None	None	100.0
Leonida A.	2010	J.Oral Implantol.	9	54	Oral	< 3 years	None	None	100.0

## Aim of the study

To evaluate whether patients who take BPs are at greater risk of implant therapy failure and complications in comparing with patients who are not treated with BPs.

## Methods and Materials

The study includes 15 patients who received totally 100 dental implants, and who were treated between the years 2003-2010.

The average follow up period, and the average duration of BPs therapy prior to the implant surgery were calculated per surgery session.

The age range of the patients, was 56 -75 years.

In 5 patients the implant therapy included bone grafting prior to or during the implant placement.

All patients were non-smokers nor diabetic.

The follow up period, was 6-85 months with the mean follow up of 31 months.

Patients :	15	14 females and 1 male
All patients were non smokers, nor diabetic and without history of chemotherapy or radiation therapy. Patients were treated between 2003- 2010, and compared to non BPs patients, all treated by same surgeon, during the same period.		
Prostheses:	24	1 full arch removable, 8 fixed full arch, 15 fixed partial prostheses
Average age:	59 years	Age range: 56-75
Bisphosphonate treatment	1-12 years before implant surgery	
	Average period - 5 years and 2 months	
	Oral BPs - 14 patients. IV BPS - 1 patient.	
Follow up period:	6-85 months	Mean follow up period: 31 months
Implants:	100 (Maxilla-31, Mandible-43, Augmented bone-26)	
	In native bone - 74	CSR - 100 %
	After bone graft (Onlay and GBR) - 12	CSR - 100 %
	After Sinus Lift - 14 (10 failed)	CSR - 28.6 %

## Results

43 implants were placed in the mandible without prior augmentation, and 31 implants were placed in the maxilla without prior augmentation.

All 74 implants were osseointegrated without any failure (CSR=100 % )

From the 26 implants placed after major bone augmentation surgery, 10 implants were failed (CSR=61.54 % )

**Distribution of implants according to the type of implantation. (excluding implants placed in sinus lift sites.)**

	Control group			BPs taking group		
Type of implantation	Implan ts	Failed	CSR	Implan ts	Failed	CSR
2 stage protocol	879	18	97.95 %	57	None	100.0 %
Immediate loading	699	18	97.42 %	29	None	100.0 %
Total	1578	36	97.72 %	86	None	100.0 %
Immediate implantation	596	12	97.99 %	29	None	100.0 %
Imm. implant/imm. load.	289	7	97.58 %	16	None	100.0 %

**Kind of BPs therapy and implants failure - in augmented sites, (after sinus lifts, and onlay bone grafting.)**

Patien t No.	BPs thera py	Durati on Years	Bone augmentation procedure	Impla ntsNo.	Failed impla nts	Complicatio ns
1	Oral	4	Autogenous vertical onlay block	3	None	None
2	Oral	1	Allograft-lateral onlay block	6	None	None
15	Oral	6	Vertical GBR - Allograft	3	None	None
Total				12	None	CSR = 100 %
4	IV	4	Sinus lift	4	4	Osteonecrosis
5	Oral	1-2	Sinus lift-bilateral	10	6	None
Total				14	10	CSR= 28.6 %

## Conclusions

Dental implants placed in osteoporotic patients taking oral BPs, can osseointegrate and remain functionally stable, even in patients under oral BPs therapy > 10 years prior to the implant placement.

Development of ONJ in this group of patient is very rare.

New approaches and protocols, in dental implant therapy such as immediate loading and immediate implantation even with immediate loading, are viable and with the same predictability in comparing with the non osteoporotic patients which are without oral BPs therapy.

Sinus lift procedure in BPs patients can yield less success rate in comparing with patients without BPs therapy.

Patients with intravenous therapy of BPs, should be treated very carefully with dental implant therapy, because of the possible risks of failure and developing ONJ. Bone augmentation procedures in this group of patients should be avoided.

Treatment planning of dental implant therapy in patients taking oral BPs, should not differ in comparing with patients without BPs therapy. Fixed prostheses supported by dental implants are highly predictable.

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