

Is Dental Implantation Indicated in Patients with Oral Mucosal Diseases

SUMMARY

Background/Aim: Dental implants are a reliable treatment choice for rehabilitation of healthy patients as well as subjects with several systemic conditions. Patients with oral mucosal diseases often exhibit oral mucosal fragility and dryness, erosions, blisters, ulcers or microstomia that complicate the use of removable dentures and emphasize the need for dental implants. The aim of the current study is to review the pertinent literature regarding the dental implantation prospects for patients with oral mucosal diseases. **Material and Method:** The English literature was searched through PubMed and Google Scholar electronic databases with key words: dental implants, oral mucosal diseases, oral lichen planus (OLP), epidermolysis bullosa (EB), Sjögren's syndrome (SS), cicatricial pemphigoid, bullous pemphigoid, pemphigus vulgaris, scleroderma/systemic sclerosis, lupus erythematosus, leukoplakia, oral potentially malignant disorders, oral premalignant lesions, oral cancer and oral squamous cell carcinoma (SCC). **Results:** Literature review revealed dental implantation in patients with OLP (14 articles), EB (11 articles), pemphigus vulgaris (1 article), SS (14 articles), systemic sclerosis (11 articles), systemic lupus erythematosus (3 articles) and oral SCC development associated with leukoplakia (5 articles). No articles regarding dental implants in patients with pemphigoid or leukoplakia without SCC development were identified. Most articles were case-reports, while only a few retrospective, prospective or observational studies were identified. **Conclusions:** Dental implants represent an acceptable treatment option with a high success rate in patients with chronic mucocutaneous and autoimmune diseases with oral manifestations, such as OLP, SS, EB and systemic sclerosis. Patients with oral possibly malignant disorders should be closely monitored to rule out the development of periimplant malignancy. Further studies with long follow-up, clinical and radiographic dental data are required to predict with accuracy the outcome of dental implants in patients with oral mucosal diseases.

Key-words: Dental Implants, Oral Lichen Planus, Epidermolysis Bullosa, Pemphigus Vulgaris, Sjögren's Syndrome, Systemic Sclerosis, Leukoplakia, Oral Carcinoma

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Introduction

Dental implants are a reliable treatment choice for rehabilitation of partially or completely edentulous patients¹. On the basis of the implant failure factors that have been proposed, i.e. clinical or/and radiographic findings that require implant extraction- pain or mobility

during clinical examination or periimplant radiolucency in dental x-rays², the success rate of dental implantation surpasses 90% during a 10-year-observation period³.

This high success rate generally refers to subjects with unremarkable medical history. On the other hand, medically compromised subjects, with systemic diseases such as diabetes mellitus, osteoporosis, cardiovascular

disease, immunosuppression etc. were considered to be at an increased risk for implant placement and a number of relative and absolute contraindications have been suggested⁴⁻⁶.

Recently, investigators have proposed that head and neck radiotherapy at a dose > 50Gy, intravenous bisphosphonates therapy and chronic systemic treatment with hormonal agents, corticosteroids or immunosuppressive drugs may be considered to be contraindications for implant placement⁷. Other studies have stated that positive history for hepatitis, cardiovascular diseases, rheumatic disorders and osteoporosis are significantly associated with increased rates of implant failure. However there is no consensus on those issues, which still remain controversial^{8,9}. Therefore nowadays, the spectrum of indications for dental implants in medically compromised patients has undergone many modifications and has been widened.

In addition to the impact of systemic diseases, the possible effect of oral mucosal diseases on the successful rehabilitation with dental implants has attracted increasing interest during the last decade^{1,10}. The oral mucosal soreness observed in several mucocutaneous diseases and the oral dryness in patients with autoimmune disorders, such as Sjögren's syndrome (SS) or lupus erythematosus, complicates the proper oral hygiene and predisposes to increased dental caries, periodontal disease and infections leading to further tooth loss¹¹⁻¹³. Except for the oral mucosal fragility and xerostomia in those subjects, patients with rare diseases, such as epidermolysis bullosa (EB) and scleroderma, are characterized by various oral complications, e.g. blisters, tissue scars, induration and microstomia, which hinder the use of removable dentures and render dental implants not only a promising therapeutic solution, but occasionally the single treatment of choice^{12,14-16}.

The aim of the present study is to review the pertinent literature regarding the dental implant treatment prospects for patients with oral mucosal diseases.

Materials and Methods

PubMed and Google Scholar electronic databases were searched in April 2017 with the following key words: dental implants, oral mucosal diseases, oral lichen planus (OLP), EB, SS, cicatricial pemphigoid, bullous pemphigoid, pemphigus vulgaris, scleroderma/systemic sclerosis, lupus erythematosus, leukoplakia, oral premalignant lesions, oral cancer, oral squamous cell carcinoma (SCC). Only studies from the English literature were selected. Prospective or retrospective clinical studies, case studies or case-reports were included in the current analysis. Review papers were excluded.

Data retrieved included number of patients, patients' demographics, history of autoimmune disorders, oral manifestations, number of inserted implants and type of prosthodontic restoration, implants success rate and follow-up period. Implants were considered as successful in case there was no need for removal at the study end point; thus, the implant success rate coincided with the survival rate. In cases with oral carcinoma development, information about the time interval between the placement of implants and cancer diagnosis, the site and clinical presentation of cancer, prior positive oral cancer history and smoking habits were also recorded. Studies regarding dental implants in patients with *de novo* oral cancer, i.e. without history of oral mucosal disease, were excluded.

Results

The literature review yielded 50 studies with regards to dental implants in patients with oral mucosal diseases; in particular, 14 studies referred to OLP^{13,17-29}, 11 studies to EB^{15,30-39}, 1 study to pemphigus vulgaris⁴⁰, 14 studies to SS^{11-14,21,41-49}, 11 studies to systemic sclerosis^{13,48-57}, 3 studies to systemic lupus erythematosus (SLE)^{14,29,44} and 5 studies to oral SCC development associated with leukoplakia^{27,58-61}. Five studies presented patients with more than one oral mucosal disease^{13,21,27,29,48}. Studies regarding dental implants in patients with cicatricial or bullous pemphigoid, as well as in patients with leukoplakia that did not progress into oral malignancy, were not identified.

Oral Lichen Planus

Our review identified 14 studies from the English literature with 87 OLP patients (63 females and 24 males, female to male ratio: 2.63:1) who have received more than 313 dental implants^{13,17-29}. In 3 patients information on the number of implants inserted was not available²⁷. In particular, 9 case reports^{13,19-22,25,26,28,29}, 3 retrospective studies^{18,24,27} and 2 prospective controlled studies^{17,23} were retrieved. In the majority of the patients, OLP was diagnosed prior to implants' insertion^{13,17-26}; in two studies implants were placed before and after the diagnosis of OLP^{18,25}, while in two studies information regarding to exact time of implant insertion was missing^{27,29}. One OLP patient also suffered from SS²¹ and another from SLE²⁹. At the time of first examination OLP type was predominantly reticular or plaque-type in 19 (21.8%) patients, erosive or atrophic in 38 (43.7%) patients and unspecified in 30 (34.5%) patients (Table 1). In 32 cases with available information on the intraoral site of OLP lesions, the buccal mucosa and the gingiva were mainly involved, followed by the tongue and palate (Table 1). In 9 patients OLP lesions were noticed in close proximity to the dental implants^{18,24}. Desquamative

gingivitis was reported in 16 subjects^{23,24}. In symptomatic OLP cases, a steroid-based therapy either topical or systemic usually preceded implants insertion^{17,18,21-23,26}. Moreover, disease exacerbations during the postoperative and the follow-up period were managed with topical corticosteroids, antifungal agents or retinoids^{18,21,23,24}. The type of prosthodontic restoration was reported in 73/87 (83.9%) OLP patients and in the majority of the cases (64/73, 87.7%) represented a fixed prosthesis^{13,17,19,23-29}.

Among 87 OLP patients with dental implants, 8 women (9.2%) developed oral SCC, which presented as a mandibular exophytic mass; two of them within the first year following implant insertion²⁷ and four 3^{19,22} or 4 years^{26,27} post-insertion. In two patients the interval between implant

insertion and oral cancer development was unspecified²⁹. Three OLP subjects with SCC were smokers^{19,27}, 2 had a history of oral cancer^{22,27} and one had been also diagnosed with oral leukoplakia²⁷. Dental implants in close proximity to the oral malignancy were removed^{19,22,26,27}. In contrast, 244/288 implants survived in 79 OLP patients without SCC development during a follow up period ranging from 21 months to 13 years (success rate = 84.7%)^{13,17,18,21,23-25,28}. Two implants failed in a patient with bruxism 32 and 60 months after their insertion²⁰, while 42 implants were lost in 20 patients with active OLP within the first year of their placement¹⁷. These 42 implants were replaced with absolute success for a 3-year-observational period¹⁷.

Table 1. Demographics and clinical data of OLP patients, number of implants, implants success rate, duration of follow-up and oral SCC development

Reference	Patients	Gender	Age (years)	OLP type*	OLP Site*	Implants	Success rate (%)	Follow-up (months)**	SCC development
Esposito et al 2000 ²⁰	1	F	69	erosive	NA	2	0	32, 60	no
Esposito et al 2003 ²¹	2	F	72	erosive	buccal mucosa, gingiva	2	100	21	no
		F	78	erosive	NA	2	100	21	no
Oczakir et al 2005 ¹³	1	F	74	NA	NA	4	100	72	no
		F	63	reticular (and atrophic)	gingiva	4	100	156 (2), 24 (1), NA(1)	no
Reichart 2006 ²⁵	3	F	68	reticular (and atrophic)	buccal mucosa, gingiva	1	100	36	no
		F	79	atrophic	gingiva	5	100	NA	no
Czerninski et al 2006 ¹⁹	1	F	52	NA	NA	3	0	36	yes
Gallego et al 2006 ²²	1	F	81	plaque-type (and erosive)	palate, buccal mucosa, tongue buccal	4	0	36	yes
Hernandez et al 2012 ²³	18	14F, 4M	mean: 53.7	erosive (18)	mucosa (18), gingiva (11) buccal	56	100	mean: 53.5	no
Czerninski et al 2013 ¹⁸	14	11F, 3M	mean: 59.5	erosive (6), atrophic (5), reticular (3)	mucosa, gingiva (mainly)	54	100	12 to 24	no
Marini et al 2013 ²⁶	1	F	51	plaque-type	NA	2	0	108	yes
		F	54	NA	NA	NA	NA	7 m	yes
Moergel et al 2013 ²⁷	3	F	69	NA	NA	NA	NA	6 m	yes
		F	80	NA	NA	NA	NA	51 m	yes
Lopez-Jornet et al 2014 ²⁴	16	10F, 6M	mean: 64.5	erosive/atrophic (5), reticular (11)	NA	56	100	mean: 42	no
Silva et al 2014 ²⁸	1	F	54	plaque-type, reticular	tongue	5	100	24	no
Raiser et al 2016 ²⁹	2	2F	55, 70	NA	NA	16	<100	36, 96	yes
Aboushelib & Elsafi 2017 ¹⁷	23	12F, 11M	mean: 56.7	NA	NA	55	23.6	8-11	no
						42	100	36	no

Abbreviations: OLP, oral lichen planus; F, female; M, male; NA, not available; SCC, squamous cell carcinoma

* Numbers in parentheses represent patients

** Numbers in parentheses represent implants

Epidermolysis Bullosa

The first case of dental implants in EB patients was published³⁷ in 2000. To date, 11 studies (6 case-reports^{15,30-34}, 3 prospective³⁵⁻³⁷ and 2 retrospective studies^{38,39}) could be disclosed reporting rehabilitation of 29 EB patients (19 females, 9 males, 1 gender not specified) with 180 dental implants. EB patients exhibited multiple bleeding blisters or ulcers, ankyloglossia,

microstomia, buccal and vestibular sulci obliteration, jaw atrophy and formation of soft tissue scars^{15,30-39}. Fixed prostheses^{15,30-36,38,39} and removable overdentures^{35,37} were used in 22 and 7 patients, respectively, while in five subjects with atrophic jaws implants were inserted simultaneously with bone grafts^{31,38}. During an observational period ranging from 1 to 9 years, 177/180 (98.3%) implants were successfully retained (Table 2).

Table 2. Demographics of EB patients, number of implants, implants success rate and duration of follow-up

Reference	Patients	Gender	Age (years)	Implants	Success rate (%)	Follow-up (months)
Penarrocha-Diago et al 2000 ³⁷	4	M	30	3	100	36
		F	35	2	100	12
		F	30	6	100	24
		F	26	4	100	48
Penarrocha et al 2007 ³⁶	3	M	29	9	100	36
		F	44	9	100	60
		F	43	9	88.9	24
Penarrocha et al 2007 ³⁵	6	F	23	2	100	108
		F	36	6	100	96
		M	28	3	100	84
		M	29	9	100	36
		F	44	9	100	60
		F	43	9	88.9	24
Lee et al 2007 ³²	1	M	29	8	100	17
Larrazabal-Moron et al 2009 ³¹	1	F	52	2	100	18
Oliveira et al 2010 ³⁴	1	F	17	2	100	30
Müller et al 2010 ³³	1	NA	NA, ≥20, <25	10	100	NA, ≤60
Penarrocha-Oltra et al 2011 ³⁹	6	F	24	4	100	24
		F	34	8	100	36
		M	55	8	100	12
		F	51	4	100	24
		F	33	4	100	12
		M	27	8	100	48
Penarrocha-Oltra et al 2012 ³⁸	4	M	27	9	100	24
		M	55	8	100	12
		F	51	4	100	48
		F	44	2	100	24
Agustín-Panadero et al 2015 ³⁰	1	F	19	8	87.5	18
Letelier et al 2016 ¹⁵	1	F	31	11	100	6 (6), <12 (5)*

Abbreviations: EB, epidermolysis bullosa; F, female; M, male; NA, not available

* Numbers in parentheses represent implants

Pemphigus Vulgaris, Cicatricial Pemphigoid, Bullous Pemphigoid

In contrast to OLP and EB, literature data on dental implants in patients with other mucocutaneous disorders are scarce. Literature review yielded only one case report of a female patient with pemphigus vulgaris, medicated with systemic corticosteroids and azathioprine, who had received two implants and has been successfully followed up for 32 months⁴⁰. No case regarding dental implants in patients with cicatricial or bullous pemphigoid has been found in the literature.

Sjögren's Syndrome

Implant rehabilitation in a SS patient was initially reported⁶² in 1993 and since then more than 428 dental implants have been placed in 115 SS subjects (105 females, 5 males, 5 gender not specified), documented by 10 case-reports^{11,13,14,21,41-46}, 3 retrospective studies^{12,48,49} and 1 observational cohort study⁴⁷. In one study, information on the number of implants inserted was not available⁴². Forty seven (40.9%) patients were diagnosed with primary SS^{12,13,21,41,45,46}, one of whom also suffered from OLP²¹. Dental implants were also placed in thirty

three patients (28.7%) with SS associated with other autoimmune diseases (20 with rheumatoid arthritis-RA^{11,43,45,48,49}, 2 with SLE^{14,44}, 1 with scleroderma¹³, 1 with RA and scleroderma⁴⁸, 9 unspecified¹²). In 35 (30.4%) An SS case, information about concomitant connective tissue diseases was not available^{11,42,47}. Data regarding the prosthodontic rehabilitation was available

in 12 studies involving 81 SS subjects; in particular, fixed prostheses were selected in 6 studies^{14,41,43-46}, removable overdentures in 1 study²¹ and both prosthodontic restoration types were used in 5 studies^{11-13,48,49}. Of the 407 dental implants with available survival rates, 22 failed during a follow-up period ranging from 1 to 13 years, corresponding to a success rate of 94.6 % (Table 3).

Table 3. Demographics of SS patients, number of implants, implants success rate and duration of follow-up

Reference	Patients	Gender	Age (years)	Implants	Success rate (%)	Follow-up (months)
Payne et al 1997 ⁴⁵	3	F	38	12	75	96
		F	38	6	100	12
		F	40	8	100	12
Isidor et al 1999 ¹¹	8	F	53-70	6	50	48
		F	NA	5	60	48
		F	NA	10	100	48
		F	NA	6	100	48
		F	NA	4	100	48
		F	NA	7	57.1	48
		F	NA	6	100	48
		F	NA	8	75	24
Esposito et al 2003 ²¹	1	F	72	2	100	21
Binon et al 2005 ⁴¹	1	M	76	6	100	156
Oczakir et al 2005 ¹³	2	F	63	4	100	24
		F	64	8	100	60
Weinlander et al 2010 ⁴⁹	4	NA	NA	6	NA	91
		NA	NA	3	NA	46
		NA	NA	4	NA	48
		NA	NA	8	NA	42
Spinato et al 2010 ⁴⁶	1	F	62	6	100	12
Ergun et al 2010 ⁴⁴	1	NA	NA	6	100	24
Krennmair et al 2010 ⁴⁸	8	F	68	6	100	96
		F	48	3	100	48
		F	42	4	100	50
		F	72	8	100	44
		F	41	3	100	49
		F	52	4	100	52
		F	55	4	100	34
		F	41	7	100	42
de Mendonça Invernici et al 2014 ⁴³	1	F	58	3	100	72 (2), NA (1)*
Korfage et al 2015 ¹²	50	46F, 4M	mean: 67	144	97	mean: 46
Chochlidakis et al 2016 ¹⁴	1	F	71	6	100	14
Albrecht et al 2016 ⁴⁷	32	32F	mean: 64.5	105	99	mean: 59
Chatzistavrianou and Shahdad 2016 ⁴²	2	F	NA	NA	100	18
		F	NA	NA	100	24

Abbreviations: SS, Sjögren's syndrome; F, female; M, male; NA, not available

* Numbers in parentheses represent implants

Systemic Lupus Erythematosus

Limited literature data exist regarding dental implants in SLE patients. Ergun et al.⁴⁴ reported the successful placement of six dental implants in a patient with dry mouth, diagnosed with SLE and SS, who was followed for 2 years. Moreover, one OLP patient treated with dental implants had a positive history for SLE and ultimately developed a mandibular SCC²⁹.

Systemic Sclerosis

Eleven studies (9 case reports^{13,50-57} and 2 retrospective studies^{48,49}) reported rehabilitation of 11 systemic scleroderma patients (6 females, 1 male, 4 with unknown gender) with more than 61 dental implants. Microstomia, difficulty in mastication, root resorptions and advanced periodontal disease were observed in most patients^{50-55,57}. Five patients suffered from systemic sclerosis alone^{50-53,55},

one was diagnosed with concomitant SS¹³, one with SS and RA⁴⁸, whereas in 4 cases there was no information^{13,48,49,56}. Eight scleroderma patients were rehabilitated with a fixed implant-supported prosthesis^{48-52,54,55,57} and three with

overdentures^{13,53,56}. Forty one out of 42 dental implants in 6 patients with known outcome^{13,48,49,52,56,57} were successfully followed up for a period of 2 to 5 years (success rate= 97.6%, Table 4).

Table 4. Demographics of systemic sclerosis patients, number of implants, implants success rate and duration of follow-up

Reference	Patients	Gender	Age (years)	Implants	Success rate (%)	Follow-up (months)
Jensen & Sindet-Pedersen 1990 ⁵²	1	M	41	9	88.9	24
Langer et al 1992 ⁵³	1	F	54	2	NA	NA
Raviv et al 1996 ⁵⁶	1	NA	65	3	100	24
Patel et al 1998 ⁵⁵	1	F	54	4	NA	NA
Haas 2002 ⁵¹	1	F	49	7	NA	NA
Oczakir et al 2005 ¹³	1	F	64	8	100	60
Krennmair et al 2010 ⁴⁸	1	F	55	4	100	34
Weinlander et al 2010 ⁴⁹	1	NA	NA	6	100	46
Zigdon et al 2011 ⁵⁷	1	NA	45	12	100	36
Nam et al 2012 ⁵⁴	1	NA	NA	NA	NA	NA
Baptist 2016 ⁵⁰	1	F	61	6	NA	NA

Abbreviations: F, female; M, male; NA, not available

Leukoplakia/Oral SCC

The review of the pertinent literature revealed 16 patients with clinically diagnosed leukoplakia who had developed SCC in the vicinity of dental implants (9 females, 7 males, female to male ratio= 1.3:1; age range= 42-88 years, mean age= 69.4 years)^{27,58-61}. In 14/16 patients implant rehabilitation was established with removable prostheses^{27,58,59}, in one subject with a fixed prosthesis⁶¹, while in one case information regarding prosthodontic restoration was missing⁶⁰. Twelve out

of the 16 subjects (75%) had a positive history of oral cancer (Table 5). At the time of periimplant carcinoma diagnosis, 5/16 (31.3%) patients were current smokers, 3/16 (18.6%) past smokers, 4/16 (25%) non-smokers, whereas data about smoking habits were missing in 4 (25%) cases (Table 5). Periimplant cancer predominantly involved the mandible (15/16-93.6% cases), mainly as an exophytic mass or gingival hyperplasia mimicking periimplantitis, and less often as an ulcer (Table 5).

Table 5. Demographics, smoking habits and positive oral SCC history in patients with leukoplakia who developed SCC after implant placement, number of implants, interval between implants insertion and SCC diagnosis, SCC site and clinical picture

Reference	Patients	Gender	Age (years)	Implants	Interval between implant insertion and SCC diagnosis	SCC clinical picture	SCC site	Smoking habits	History of oral SCC
Block and Scheufler 2001 ⁵⁸	1	M	72	8	5	peri-implantitis	man	past	yes
Shaw et al 2004 ⁶¹	1	F	69	3	60 (1st SCC), 84 (2nd SCC)	ex, peri-implantitis	man	NA	yes
Gulati et al 2009 ⁵⁹	1	F	72	5	96	peri-implantitis	man	past	yes
Moergel et al 2013 ²⁷	12	F	63	NA	42	ex	man	no	yes
		F	70	NA	48	ex	man	yes	yes
		M	72	NA	43	ex	man	no	yes
		M	57	NA	120	ex	man	yes	yes
		M	72	NA	43	ex	man	NA	no
		M	88	NA	115	ulcer	man	no	no
		F	42	NA	42	ulcer	man	NA	yes
		F	59	NA	29	ulcer	man	NA	yes
		M	73	NA	97	ex	max	past	yes
		M	77	NA	43	ex	man	yes	no
Kaplan et al 2016 ⁶⁰	1	F	68	NA	110	ex	man	yes	yes
		F	80	NA	51	ex	man	yes	no
		F	77	NA	NA	ex	man	no	yes

Abbreviations: SCC, squamous cell carcinoma; F, female; M, male; NA, not available; ex, exophytic mass; man, mandible; max, maxilla

Discussion

The present study summarizes the current evidence regarding dental implantation in patients with oral mucosal diseases. It was interesting to note that the number of studies available on this topic is constantly increasing which can be possibly explained by the functional, esthetic, and psychological benefits that these patients experience, which urge investigators to explore the implant treatment prospects in this group of individuals.

OLP and SS represent the two disease entities that have been more extensively investigated so far^{10,14,63}, although concerns have been raised in the past about the long-term success of dental implantation in those patients. It has been speculated that the health of the periimplant tissues in OLP patients may be compromised by the impaired attachment of the oral epithelium to the titanium surface, leading to a defective mucosal block to microorganisms⁶⁴. Moreover, it has been suggested that upregulated pro-inflammatory cytokines induced by oral epithelial cells in OLP subjects stimulate resorption of the periimplant alveolar bone^{65,66}. In contrast, the current literature seems to encourage dental implantation in OLP patients. According to three studies which compared the outcome of dental implants between OLP subjects and healthy controls^{18,23,24}, no difference was detected between the two groups in terms of implant stability and development of periimplant mucositis or periimplantitis. These findings suggest that the disease severity or the intraoral site of involvement do not seem to affect the survival of dental implants^{18,23,24}. However, detailed description of the clinical forms of the disease and information on the site affected is missing in several studies. Furthermore the number of cases with desquamative gingivitis^{23,24} is quite small or information on implant placement adjacent to OLP lesions^{18,24} is scarce and thus a protocol on clinical management of these cases cannot be established. Dental implants should not be inserted during the acute phase of the disease^{17,23} and caution should be exercised in patients with parafunctional habits, due to an increased risk for failure²⁰. Treatment with topical (e.g. clobetasol propionate mouthwashes or ointment, dexamethasone, triamcinolone acetonide) or systemic corticosteroids (e.g. oral prednisone) should precede the placement of implants in symptomatic OLP cases and medication should be re-implemented in case of exacerbations during the follow-up period^{17,18,21,23}. Long term systemic steroid therapy, although rare, may lead to immunosuppression and subsequently interfere with the mucosal healing capacity¹⁸.

The long-term survival of dental implants in SS patients has been previously challenged by the disturbed immune response caused by the disease itself and the chronic immunosuppressive therapy⁴. However, to date,

implant restoration in SS subjects has shown favorable results. According to a retrospective study evaluating the implant outcome in SS patients and healthy controls, the survival rates of dental implants, the incidence of periimplant mucositis, periimplantitis and several periimplant clinical indices (bleeding index, plaque index etc.), were comparable between the two groups¹². A subsequent observational cohort study provided similar results⁴⁷. According to the reviewed literature, in the present study no significant differences in the implant survival rates between patients with primary or secondary SS associated with other autoimmune disorders, could be detected, which is in accordance with previous reports¹².

Data on dental implants in patients with other autoimmune diseases, including pemphigus vulgaris, SLE or pemphigoid, as well as in patients with leukoplakia without malignant transformation are scarce or missing^{29,40,44}. In contrast, implants have been evaluated in patients with rare disorders involving oral mucosa, such as EB and systemic sclerosis¹⁰. The severe microstomia, which is a common complication of both aforementioned diseases, and the tendency for blister formation after minor trauma seen in EB, cause significant difficulties in the use of conventional prostheses and, therefore, stress the need of a therapeutic alternative.

Despite the small number of patients treated, literature favors dental implantation in EB subjects^{15,30-39}. Precautionary measures during implant surgery in EB patients include lubrication of lips and intraoral tissues with petroleum jelly and close contact of the aspirator with the bone rather than the mucosa. Local anesthesia is preferable versus general to avoid intubation-induced ulcers and should be performed slowly and deeply into the oral soft tissues to reduce the risk of blistering^{30,31,35-37,39}. Bone grafting simultaneously to implant placement is effective in case of severe jaw atrophy^{31,38} and fixed prostheses are preferred compared to overdentures³⁵ in order to avoid irritation of the fragile oral mucosa during mastication³⁷.

Dental implants have also been considered a viable therapeutic solution in patients with systemic sclerosis, who have difficulty to handle and tolerate the removable dentures, because of limited mouth opening and finger deformities^{52,53,55}. Implant-supported prostheses contribute decisively to the improvement of function, aesthetics and sociability of these patients⁵⁰. In particular, implant placement in the anterior maxillary and mandibular portion between the canines is indicated to ensure stability of the prosthetic restoration and the improvement of facial aesthetics⁶⁷. However, due to the scarce literature on dental implantation in scleroderma subjects, and the lack of detailed information on the observational period and the success rates^{13,48-57}, further studies are warranted to propose specific treatment recommendations⁵⁰.

Patients with oral potential malignant disorders, such as leukoplakia and OLP, are at risk for cancer development. Prior to case selection for implant therapy, factors, e.g. tobacco or alcohol consumption, should be modified⁶⁸. Short-interval follow-up examinations are crucial after implant rehabilitation to early detect possible malignant transformation^{68,69}. Implant-supported prostheses should be regularly removed in order to clinically evaluate the periimplant soft tissues and, thus, fixed prostheses should be selected with caution, especially in patients with a positive history of cancer and risk for recurrence^{27,61}. A carcinoma adjacent to dental implants may manifest as an exophytic mass mimicking an inflammatory reactive lesion of the gingivae or periimplantitis^{27,58}, and efforts to manage through periodontal treatment may cause delay in diagnosis⁵⁹. Thus, tumors and ulcers arising in the proximity of dental implants, resistant to conventional therapeutic measurements, should be biopsied and submitted to histopathological examination^{27,59,69}.

Conclusion

In conclusion, based on the reviewed literature, dental implants represent an acceptable and reliable treatment option with a high success rate in patients with chronic mucocutaneous diseases and autoimmune diseases with oral manifestations. However, further well-designed prospective studies, with long meticulous follow-up, are required to define treatment guidelines and recommendations and predict with accuracy the implant outcome in this group of patients.

Note: The results of this paper were presented as a part of an invited lecture at the 22nd BaSS Congress.

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