Dental implants in patients with oral lichen planus: A narrative review

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Objective: To evaluate the success and survival rates of dental implants in patients with oral lichen planus (OLP). Method and Materials: A narrative review literature search was conducted in the PubMed/Medline, Scopus, and Cochrane databases for articles published between 1990 and April 2013, using key search words “dental implants” and “oral lichen planus”. Results: This review did not identify any publications that were randomized controlled trials. A total of 60 OLP patients and 199 dental implants were analyzed. Three cases of OLP-related oral squamous cell carcinoma were reported. Conclusion: The extent and severity of underlying disease should be determined before dental implant placement. (Quintessence Int 2014;45:599–603; doi: 10.3290/j.qi.a31963)

Key words: dental implants, oral lichen planus, oral squamous cell carcinoma

Tooth loss is accompanied by functional, esthetic, and speech problems, occlusal disorders, and psychologic difficulties, therefore dental restoration with implants is an option that offers numerous benefits.1-3 For this reason, oral rehabilitation with dental implants has become a common procedure. Although few studies have dealt with the topic of oral lichen planus (OLP) and dental implants, it has been suggested that there may be a risk of implant failure in patients with OLP, due to the epithelium’s limited capacity to adhere to the implant’s titanium surface; this can affect the mucosa-titanium interface, endangering the functioning of the implant soft tissue barrier, which will give bacteria access to the peri-implant tissues.2-4 Moreover, it could be argued that dental implants would stabilize removable dentures that could result in an isomorphic effect (Köbner’s phenomenon), and thus be beneficial for the patients.

The question arises, in patients treated with dental implants, to what extent does a history of OLP increase the risk for implant failure? OLP is a relatively common mucosal disease of unknown etiology, although its autoimmune features are easily recognizable.5-7 It is more frequent among women aged 50 to 55 years. The characteristic features of OLP are its chronicity, symmetric appearance, and the involvement of multiple sites. The gums are the third most common OLP site, followed by the oral mucosa and the tongue. OLP appears in various forms: atrophic, reticular, papular, plaque-like, bullous, or erosive. Its histopathologic criteria are the presence of a well-defined band of inflammatory infiltrate composed mainly of lymphocytes, hydropic degeneration of the basal layer, and the absence of dysplasia.5

The possible risks for dental implant insertion in patients with OLP remain unclear, and to date there is insufficient scientific evidence to establish adequate

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management strategies for some of the clinical situations that might arise.4-10

In spite of the wide use of dental implants, few cases of patients with OLP and implants have been documented. The aim of this study was to perform a narrative literature review of those cases.

METHOD AND MATERIALS

Search strategy

A literature search was performed in the PubMed/Medline, Scopus, and Cochrane databases for articles published between 1990 and April 2013 on dental implants in patients with OLP using the key terms “oral lichen planus” and “dental implants”. Two independent reviewers screened titles and abstracts of the search results (APF, PLJ).

As inclusion criteria, any articles on patients diagnosed with OLP with osseointegrated dental implants were included. Clinical studies, cohort studies, case reports, and case series published in either English or Spanish were reviewed. Articles describing extraoral lesions or not involving dental implants were excluded. The following data were extracted: the population studied, the intervention made, and the results.

Data extraction strategy

The following data were sought: implant type, number of subjects, number of implants, number of subjects with early failures, number of early failing implants, years of follow-up, number of subjects followed up, number of implants followed up, number of subjects with late failures, number of late failing implants, and incidence of peri-implantitis/mucositis (Fig 1).

RESULTS

The present review did not identify any RCT (randomized controlled trial) publications. The clinical studies found were isolated cases or case series. The search located few articles; 60 patients with both OLP and osseointegrated dental implants, with a total of 199 implants. There were four single case reports, three case series, and three controlled studies (one prospective and two retrospective). Twenty-two patients had an erosive form of OLP, 18 had a reticular type, and for two patients the type of OLP was not specified. There were no data on the duration of OLP (Table 1). Mucositis was detected in 17.8% and 66.6% of the patients in two studies, and peri-implantitis in 25% and 27.7% (Table 1). The presence of desquamative gingivitis (DG) was associated with a higher rate of peri-implant mucositis for those implants of the OLP group.

The implant manufacturer was unclear in most studies. Nobel implants (Nobel Biocare) of various systems were used at least in three studies, eight included ITI implants (Straumann), two HATI implants (Mathys Dental), one Camlog (Camlog Biotechnologies), one ZL Microdent, and one Astra Tech implant.

Three cases of OLP-related oral squamous cell carcinoma (OSCC) were reported (Table 2).

DISCUSSION

Studies of dental implant treatments in patients with OLP are rare and most describe isolated cases. There is a clear need for well-conducted prospective studies of OLP and implants that would allow researchers to construct a classification system as a basis for establishing
strategies for dealing with the clinical situations that may arise in such cases. For this reason, the outcomes of this review must be treated with caution because of the small number of studies located, the short follow-up times, and the quality of the evidence.

Esposito et al\(^3\) described a single case of an OLP patient treated with dental implants. Esposito et al\(^10\) described two further clinical cases of OLP rehabilitated with implant-supported overdentures with positive outcomes in terms of function and patient satisfaction.

Oczakir et al\(^11\) described a case series of 24 patients with a variety of systemic diseases and congenital defects; one patient presented OLP and received four mandibular implants to support a complete fixed prosthesis. No complications were observed during the 6-year follow-up.

Table 1
<table>
<thead>
<tr>
<th>Study</th>
<th>OLP patients</th>
<th>Number of implants</th>
<th>Patient age</th>
<th>OLP patient sex</th>
<th>OLP type</th>
<th>OLP diagnosis, before/after implant placement</th>
<th>Mucositis/peri-implantitis</th>
<th>Implant-supported prosthesis</th>
<th>Implant type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esposito et al(^3)</td>
<td>1</td>
<td>2</td>
<td>69</td>
<td>Female</td>
<td>Erosive</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>Overdenture</td>
</tr>
<tr>
<td>Esposito et al(^10)</td>
<td>2</td>
<td>4</td>
<td>72–78</td>
<td>Females</td>
<td>Erosive</td>
<td>Before</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>Overdenture ITI</td>
</tr>
<tr>
<td>Oczakir et al(^11)</td>
<td>1</td>
<td>4</td>
<td>74</td>
<td>Female</td>
<td>Unavailable</td>
<td>Before</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>Fixed ITI</td>
</tr>
<tr>
<td>Reichart(^12)</td>
<td>3</td>
<td>10</td>
<td>63, 68, 79</td>
<td>Females</td>
<td>1 erosive, 2 reticular</td>
<td>1 before, 2 after</td>
<td>Unavailable</td>
<td>Fixed HATI, Camlog, ZL Microdenta</td>
<td></td>
</tr>
<tr>
<td>Czerninski(^14)</td>
<td>1</td>
<td>3</td>
<td>52</td>
<td>Female</td>
<td>Unavailable</td>
<td>Before</td>
<td>Unavailable</td>
<td>Fixed Unavailable</td>
<td></td>
</tr>
<tr>
<td>Gallego et al(^19)</td>
<td>1</td>
<td>2</td>
<td>81</td>
<td>Female</td>
<td>Reticular</td>
<td>Before</td>
<td>Unavailable</td>
<td>Overdenture Unavailable</td>
<td></td>
</tr>
<tr>
<td>Hernández et al(^13)</td>
<td>18</td>
<td>56</td>
<td>53.7</td>
<td>Female, 4 males</td>
<td>Erosive</td>
<td>Before</td>
<td>66.6/27.7</td>
<td>Fixed TiUnite, Nobel Direct</td>
<td></td>
</tr>
<tr>
<td>Czerninski et al(^14)</td>
<td>14</td>
<td>54</td>
<td>59.5</td>
<td>11 females, 3 males</td>
<td>11 erosive, 3 reticular</td>
<td>67% before, 13% after</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td></td>
</tr>
<tr>
<td>López Jornet et al(^13)</td>
<td>16</td>
<td>56</td>
<td>64.5</td>
<td>10 females, 6 males</td>
<td>11 reticulár, 5 erosive</td>
<td>Before</td>
<td>17.8/25.0</td>
<td>3 overdentures, 13 fixed</td>
<td></td>
</tr>
<tr>
<td>Portela Tejedor(^16)</td>
<td>3</td>
<td>8</td>
<td>53, 59, 59</td>
<td>Female, 2 females</td>
<td>Reticular and erosive</td>
<td>Before, after</td>
<td>Unavailable</td>
<td>Fixed (third case awaiting rehabilitation) Nobel, Steri-Oss, Astra Tech</td>
<td></td>
</tr>
</tbody>
</table>

Table 2
<table>
<thead>
<tr>
<th>Study</th>
<th>OLP patients</th>
<th>Number of implants</th>
<th>Patient age</th>
<th>OLP Patient sex</th>
<th>Smoking</th>
<th>Alcohol consumption</th>
<th>OLP history</th>
<th>Place</th>
<th>Time of OSCC appearance</th>
<th>Implant prosthesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czerninski et al(^13)</td>
<td>1</td>
<td>3</td>
<td>52</td>
<td>Female</td>
<td>Yes</td>
<td>Unavailable</td>
<td>8 years before OSCC</td>
<td>Mandibular</td>
<td>3 years after implant placement</td>
<td>Fixed</td>
</tr>
<tr>
<td>Abu El-Naaj et al(^19)</td>
<td>1</td>
<td>2</td>
<td>72</td>
<td>Male</td>
<td>Yes</td>
<td>None</td>
<td>20 years before OSCC</td>
<td>Mandibular</td>
<td>15 years after implant placement</td>
<td>Over denture</td>
</tr>
<tr>
<td>Gallego et al(^19)</td>
<td>1</td>
<td>2</td>
<td>81</td>
<td>Female</td>
<td>No</td>
<td>None</td>
<td>2 years before OSCC</td>
<td>Mandibular</td>
<td>2 years after OLP diagnosis and 1 year before implant placement</td>
<td>Over denture</td>
</tr>
</tbody>
</table>
Reichart\textsuperscript{12} described the rehabilitation of three OLP patients with satisfactory outcomes; one patient was monitored for 13 years.

In an excellent and well-designed controlled prospective study, Hernández et al\textsuperscript{13} studied 18 patients with OLP who received a total of 56 implants. During the follow-up period after implant insertion, recurring erosion and ulcerous manifestations were treated with topical corticosteroids, with a 100% success rate. Mucositis was detected in 66.6% of the patients, and peri-implantitis in 27.7%.

Czerninski et al\textsuperscript{14} carried out a controlled retrospective study of 14 OLP patients, who received 54 implants. The authors compared OLP signs and symptoms between patients with and without dental implants over a period of 12 to 24 months, finding no statistically significant differences in OLP manifestations. The implant success rate was 100%, perhaps explained by the fact that the study design excluded early implant failures from analysis. The results suggest that OLP is not a contraindication for dental implant placement and that the implant survival rate is the same as for OLP-free edentulous patients. The close contact between the oral epithelium and implant poses the question of whether titanium can activate OLP. However, the biocompatibility of titanium supports the supposition that there is only a minimal risk of lichenoid reaction to implant materials; indeed, these authors observed only a single case.

López Jornet et al\textsuperscript{15} in a study of 16 patients with OLP and osseointegrated dental implants, found mucositis and peri-implantitis in 17.86% and 25% of OLP patients respectively, while a control group showed 18% and 16% respectively. Therefore OLP did not appear to be a risk factor for peri-implantitis.

Portela Tejedor\textsuperscript{16} reported three cases of OLP and implants: two were rehabilitated with fixed prostheses, the third was awaiting rehabilitation.

Gingival manifestations are most commonly seen in the erosive, ulcerative, and atrophic forms of OLP. Symptomatic ulcerative or erosive gingival involvement has the potential to compromise effective plaque control\textsuperscript{6,7}. Hernandez et al\textsuperscript{13} reported that the presence of DG was associated with a higher rate of peri-implant mucositis for those implants of the OLP group ($P = .004$). Implant survival and success in the OLP group was 100%, vs 96.8% in the DG group, where only two implants were lost after prosthetic loading. Peri-implant mucositis was detected in 44.6% of the implants and 66.6% of the patients with OLP.

The main objective of OLP symptom treatment is the reduction and hopefully elimination of the pain associated with lesions.\textsuperscript{6} Various treatments have been proposed: topical corticosteroids including betamethasone, clobetasol, dexamethasone, and triamcinolone; and topical calcineurin inhibitors such as ciclosporin or retinoids, pimecrolimus, or tacrolimus. Some patients do not respond to topical treatment and so require systemic treatment with corticosteroids. Prolonged therapy is one of the factors that can increase the risk of osteoporosis, which could impair implant success rates.

Given the wide variety of implant systems in use, it might be supposed that these factors could determine OLP prognosis. However, this is not the case, and some authors report improvements in the evolution of erosive OLP after rehabilitation with implant-supported overdentures, perhaps due to a resolution of previous trauma arising from poor prosthetic fit.\textsuperscript{8,9}

Peri-implant mucositis and peri-implantitis appear to be slightly more frequent in patients with OLP than in control patients without OLP. However, the presence of implants does not seem to aggravate OLP. On the basis of the published literature, there is no reason to consider OLP a cause of implant failure, the key causes being parafunction, poor oral hygiene, and poor bone quality.\textsuperscript{1,2,8}

It is recommended that implant placement should be performed when OLP signs and symptoms are in remission. Rigorous oral hygiene practices, care of gingival lesions, and frequent check-ups are the main recommendations for OLP patients rehabilitated with dental implants.\textsuperscript{8} Nevertheless, none of the studies reviewed recognize OLP as a cause of implant loss.

Monitoring OLP is essential because of its potential malignancy. The etiology of OSCC is multifactorial and includes factors related to toxic habits (smoking, alcohol consumption), infectious agents such as human...
symphyseal region. Abu El-Naaj et al. described the OSCC in the mandible, adjacent to an implant in the case of a patient (a smoker) with a history of OLP, pre-

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