The Clinical Predicament: Peri-implantitis or Squamous Cell Carcinoma?

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Introduction

Although peri-implantitis is quite prevalent, squamous cell carcinoma (SCC) around dental implants is an atypical finding. Recent years have marked several reports of this clinical anomaly. Clinically, they are indistinguishable initially presenting with bone loss and associated loss of soft tissue.

Aim

To review and assess the risk factors associated with squamous cell carcinoma around dental implants.

Methods

An electronic search was conducted using COCHRANE, MEDLINE (PubMed), EMBASE and SCOPUS databases in order to select case reports pertaining to oral cancer and dental implants.

The key words used for the search included: "Dental Implants" OR "Dental Implantation" OR "Endosseous implants") AND (Head OR Neck OR Jaw) AND (Neoplasms OR cancer OR Carcinoma OR radiotherapy OR "oral squamous cell carcinoma" OR "irradiated jaw" OR sarcoma OR malignant*)

Inclusion criteria:

- All case reports presenting SCC around osseointegrated dental implants.
- Humans only, adults.
- Histological confirmation of SCC.

Exclusion criteria:

- Lesions other than SCC around osseointegrated dental implants.
- Non-dental implants
- Animal case report
- Reports published in languages other than English.

Sequentially, the articles were reviewed and selected by 2 independent authors. Data was extracted from these papers and seen in the table.

Results

Patient number	Author	Year	Number of patients with SCC around dental implants	Smoking history	History of previous cancer
1-2	Abu El-Naaj	2007	2	S(1), N/A(1)	NC(1), N/A(1)
3	Agostini	2011	1	N/A	C
4	Bhandari	2016	1	NS	NC
5	Bhatavadekar	2012	1	NS	NC
6	Block	2001	1	ES	C
7-12	Brabyn	2018	6	S(1), ES(1), N/A(4)	C(4), NC(1), N/A(1)
13	Chainani-Wu	2016	1	N/A	N/A
14-16	Clapp	1996	3	ES(1), NS(2)	NC(1), N/A(2)
17-18	Czerininski	2006	2	S(1), NS(1)	C(1), N/A(1)
19	del Valle	2008	1	N/A	N/A
20	Gallego	2008	1	NS	C
21-24	Granados	2020	4	NS(4)	C(1), N/A(3)
25	Gulati	2009	1	S	C
26	Ito	2018	1	ES	N/A
27-28	Jané-Salas	2012	2	ES(1), NS(1)	NC(2)
29	Jang	2020	1	N/A	C
30-32	Kwok	2008	3	ES(3)	C(1), NC(2)
33	Marini	2013	1	ES	C
34	Malthiéry	2019	1	NS	NC
35	Meijer	2010	1	N/A	C
36-48	Miranda Galvis	2020	13	S(1), ES(2), N/A(10)	C(6), N/A(7)
49-63	Moergel	2014	15	S(7), ES(1), NS(4), N/A(3)	C(9), N/A(6)
64	Nariai	2016	1	S	C
65	Oh	2018	1	N/A	N/A
66	Pfammatter	2012	1	N/A	C
67-68	Raiser	2016	2	N/A(2)	N/A(2)
69	Schache	2008	1	N/A	NC
70	Seo	2019	1	N/A	NC
71	Shaw	2004	2	NS(1), N/A(1)	C(2)

Key:	
S – Smoker	C – History of cancer
ES – Ex-smoker	NC – No history of cancer
NS – Non-smoker	N/A – Information not available
N/A – Information not available	

References:

Discussion

- Over the years, with an increase in the use of dental implants for rehabilitation, the occurrence of SCC around dental implants is being increasingly reported due to increase in implants, reporting or other.
- According to available literature, SCC surrounding dental implants can present itself as inflammation, a mass or as an ulcer with a higher prevalence in women (Brabyn, 2018).
- In a retrospective study by Moergel and colleague over 16 years, 15 patients out of 2893 presented with tumours adjacent to implants.

Some suggested hypotheses for this unusual occurrence in the literature include:

- Undiagnosed malignant lesion in the area prior to implant placement.
- Implants acting as a gateway to the bone. (Schache et al., 2008)
- Persistence of chronic swelling near dental implants.
- Radiotherapy as a source malignant degeneration.
- Recurrence around resection margin.
- Possible carcinogenic effect of the metal - this however remains to be proven.

In conclusion, the influence of dental implants in jaw annexation remains unknown.

Conclusions and Clinical Implications

- History of previous squamous cell carcinoma or other extra-oral cancer and pre-malignant lesions/conditions can be identified as relevant risk factors.
- Other risk factors include tobacco and alcohol consumption.
- Many of the cases were 'de novo' in origin.
- Unknown factors or habits may be synergistically involved in the development of cancer.

Although rare, it is the clinician's role to be aware of the plausible risk factors associated with squamous cell carcinoma around dental implants. Early identification with appropriate management is of prime importance. Prosthetic rehabilitation around such implants should be carefully managed and if necessary, superstructures can be removed to facilitate histological assessment. Clinicians should be aware of the rate of tissue change and typical SCC appearance. A certain degree of vigilance is needed when managing patients with existing risk factors.

Keywords: Peri-implantitis, Squamous cell carcinoma, dental implants.