

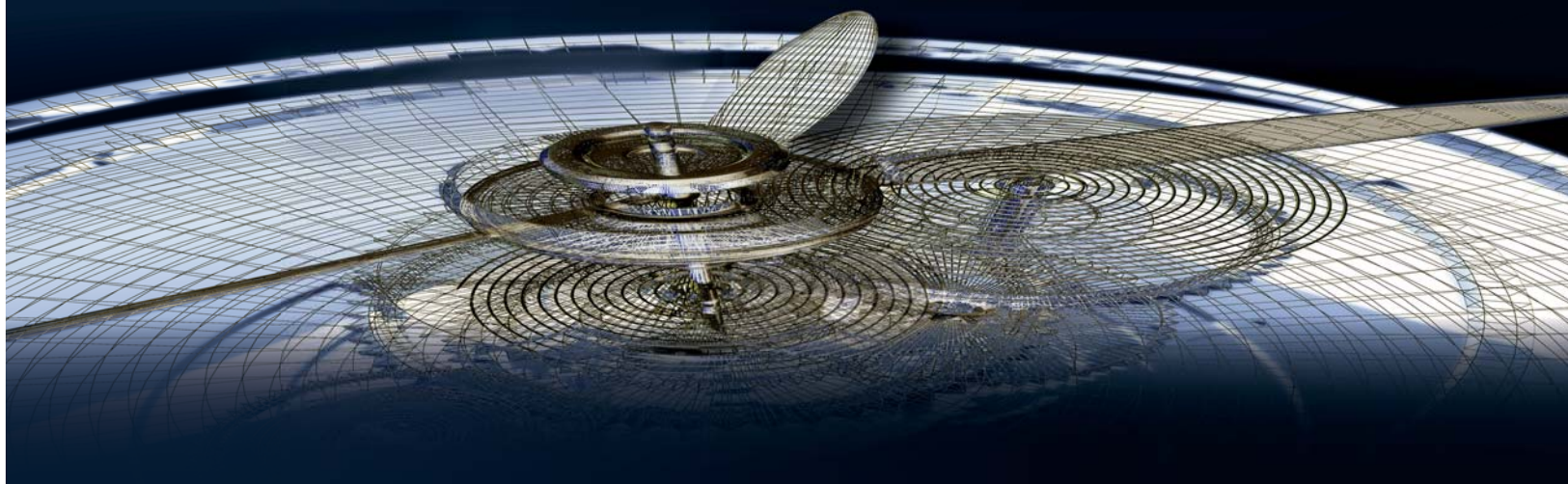


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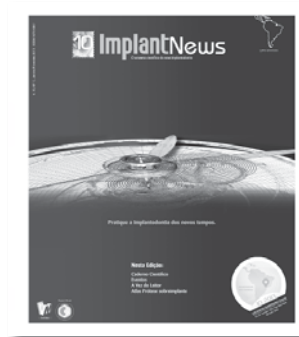
Caderno Científico
Temas em Debate
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Órgão Oficial

ImplantNews

V. 10 • Nº 1 • Janeiro/Fevereiro • 2013



Qualificação:

Qualis Nacional B3 – Medicina I
Qualis Nacional B4 – Odontologia e Interdisciplinar
Qualis Nacional B5 – Medicina II e III
Qualis Nacional B5 – Engenharias II, III e IV
Qualis Nacional B5 – Educação Física

Indexação:

BBO – Bibliografia Brasileira de Odontologia
LILACS – Literatura Latino-Americana e do Caribe em Ciências da Saúde

ImplantNews - Vol. 10, n.1 (janeiro/fevereiro/2013) - São Paulo: VM Cultural Editora Ltda., 2004

Periodicidade Bimestral

ISSN - 1678-6661

1. Implantes dentários. 2. Cirurgia de implantes. 3. Prótese sobreimplantes.
I. VM Cultural Editora Ltda. II. Título

CDD 617.6005

Black D74





Capa: visão artística que expressa a relação do homem com a cronologia.

Expediente

Fundador e Consultor: Luiz Antonio Gomes

Fundador e Diretor Executivo: Haroldo J. Vieira (diretoria.haroldo@vmcom.com.br); Editor-Chefe: Adilson Fuzo (jornalismo.adilson@vmcom.com.br); Editora e Jornalista Responsável: Cecília Felipe Nery MTB: 15.685 (jornalismo.cecilia@vmcom.com.br); Revisora: Vivian Anais Soares; Assistente de Redação: Aline Souza (jornalismo.aline@vmcom.com.br); Diretora de Arte: Miriam Ribalta (criacao.miriam@vmcom.com.br); Assistentes de Arte: Cristina Sigaud (criacao.cris@vmcom.com.br) e Eduardo Kabelle (criacao.kabelle@vmcom.com.br); Supervisora de Conteúdo *On-line*: Tharcyla Marreiro Garcia Pimentel (criacao.tharcyla@vmcom.com.br); Jornalismo *On-line*: Larissa Ambraska Depoli (jornalismo.larissa@vmcom.com.br); Gerente de T.I.: Ricardo Tanasovici (ti.ricardo@vmcom.com.br); Webdesigners: Rodolfo Mustafé (web.mustafe@vmcom.com.br) e Rogério Moreno Fermo (web.rogerio@vmcom.com.br); Webmasters: Allex Rocha (web.allex@vmcom.com.br) e Marcos Valesk de Oliveira Belice (web.marcos@vmcom.com.br); Gerente Operacional: José dos Reis Fernandes (go.reis@vmcom.com.br); Marketing: Aluizio Canto (gerencia.aluizio@vmcom.com.br); Circulação e Assinaturas: Alexandre Beceji (assinaturas.alexandre@vmcom.com.br); Administração: José Fernando Marinho.

Publicidade: Executivas de Contas: Cintia Helena Avila (atendimento.cintia@vmcom.com.br) e Erika de Carvalho (atendimento.erika@vmcom.com.br); Publicidade *On-line*: Ana Claudia Rosas (atendimento.anarosas@vmcom.com.br); Supervisora Comercial: Sílvia Bruna (atendimento.silvia@vmcom.com.br).

Redação, Marketing e Publicidade: VM Cultural Editora – Rua Gandavo, 70 – 04023-000 – São Paulo – SP

Tel.: (11) 2168-3400 - Fax: (11) 2168-3422

Impressão e Acabamento: Ipsis Gráfica e Editora.

Responsabilidade Editorial: Todos os artigos assinados, bem como conteúdos publicitários inseridos na Revista ImplantNews e edições especiais, são de inteira responsabilidade dos respectivos autores, empresas e instituições. Só será permitida a reprodução total ou parcial de conteúdos desta edição com a autorização expressa dos editores.

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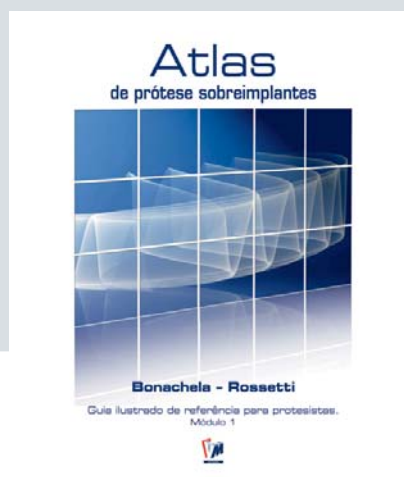


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Osseointegrated implants associated with PRP in the rehabilitation of irradiated patient with SCC of the tongue. Case report

ABSTRACT

Background: Young patients with squamous cell carcinoma (SCC) of the oral cavity are an unusual occurrence. Also, malignant tumour treatment can result in severe mutilation with unfavourable impact on cosmetic and function. Case report: This is a case of a 23-year-old man who presented a SCC of the tongue. After oncological treatment with resection and irradiation, he was rehabilitated using osseointegrated implants associated with platelet rich plasma in order to improve patient rehabilitation. Discussion: After a six-month healing period all implants were stable and clinically osseointegrated and masticatory, phonetic and aesthetic functions were restored. Results show that under controlled procedures, osseointegration is achievable even in low bone quality in irradiated sites, improving the patient's quality of life.

Key Words – Squamous cell carcinoma; Platelet-rich plasma; Dental implants.

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Background

Squamous cell carcinoma (SCC) of the oral cavity is the sixth most common cancer of the world¹, and accounts for more than 95% of all malignant neoplasms in the oral cavity². Generally this type of cancer occurs in the elderly, after the fifth decade of life, mostly related with long exposure to tobacco and alcohol³.

The treatment of malignant tumours in the oral cavity can result in patient severe mutilation with unfavourable impact on cosmetic and poor functional long term results. Due to changed intraoral conditions, like anatomic site and oral sequelae of radiotherapy, possibilities to obtain proper stability and retention for mandible prosthesis are more difficult⁴.

Previous irradiation is considered to be a controversial subject related to the use of titanium implants for dental rehabilitation in head and neck cancer patients. There is no consensus of an ideal time for implant surgery, and

how radiation affects implant survival rates⁵. However, new techniques and biomaterials that could increase the bone healing process have been studied during the last years and shows promising results for dental rehabilitation of irradiated patients.

In the current article we will present a case report of a young-adult patient, with SCC of the tongue, who was submitted to a large resection of oral tongue and floor of mouth and full course irradiation therapy, and after rehabilitated using osseointegrated implants associated with platelet enriched plasma to improve bone healing.

Case report

In 2003, a 23-year-old male, non-smoker, presented with a SCC history at the Hospital A. C. Camargo. The patient stated that six months before he was submitted to a partial glossectomy and irradiation therapy with a total dose of 62Gy. During the clinical exam it was revealed an extensive ulcerative lesion in the remaining tongue with obvious evidence of clinical recurrence of the SCC, showing also evidence of bilateral neck metastasis. Biopsy confirmed the presence of the squamous cell carcinoma and patient was submitted to a total glossectomy, involving segmental resection of total mandible alveolar crest resulting in complete inferior teeth removing, and bilateral neck dissection. In the same time, a microsurgical myocutaneous femoral flap was grafted to cover the large defect. Recovery was uneventful, although severe functional and aesthetic defects were produced due to tongue resection and absence of inferior teeth.



Figure 1
Up: clinical aspect after initial partial glossectomy and irradiation therapy. Observe an extensive ulcerative lesion in the remaining tongue suggesting clinical recurrence of squamous cell carcinoma of the tongue. Down: panoramic X-ray showing previous dental condition.

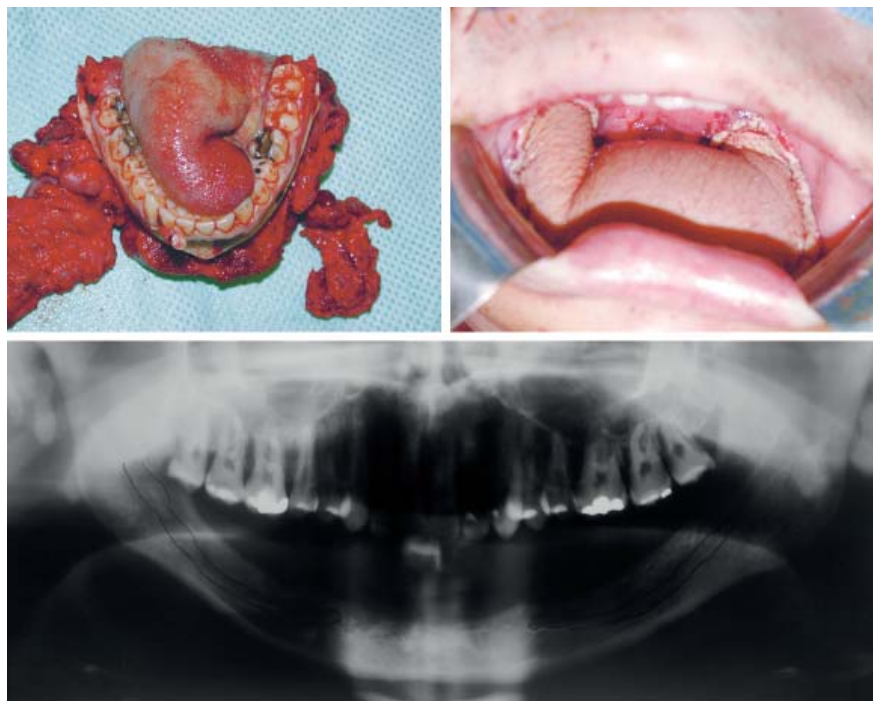


Figure 2

Upper left: surgical resection piece: total glossectomy, segmental resection of mandible alveolar crest and bilateral neck dissection. Upper right: microsurgical miocutaneous femoral flap to cover floor of the mouth defect. Down: panoramic X-ray showing dental condition after surgical resection.

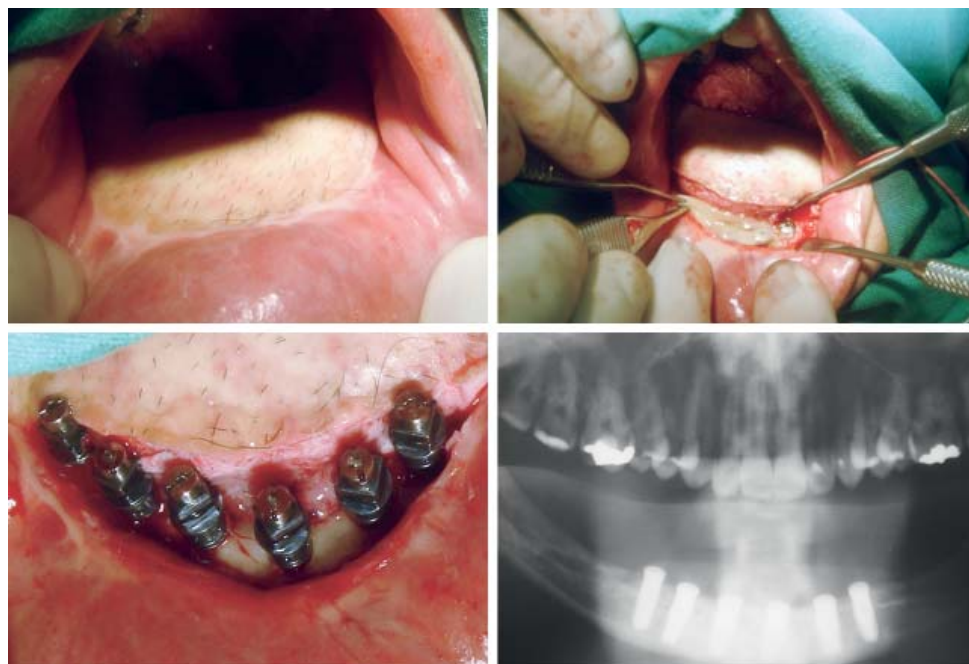


Figure 3

Upper left: clinical aspect after recovery. Upper right: implant surgery with PRP addition. Down: clinical and radiographic final results.



Figure 4
Clinical aspect of full fixed bridge anchored by implants.

Considering the total absence of alveolar crest or lingual sulcus, it was impossible to use any removable inferior denture, so the only option to restore masticatory function would be endosseous implants, nevertheless the previous irradiation would be a contraindication. In 2006, considering the low quality of life until that time, patient accepted the risks of surgery for installation of endosseous implants. At the Maxillofacial Rehabilitation Center of Sao Paulo Federal University (Unifesp), under general anesthesia, six 4.0x13mm Ti-blasted dental implants (Vulcano, Conexão, Sistema de Próteses, São Paulo, Brazil) were inserted into the remaining and previously irradiated mandibular bone. At the time of implants installation platelet enriched plasma was used into the bone socket and over the implants cover screw. Suture was performed and soft tissue healing occurred uneventfully.

After a six-month healing period, in the second stage surgery, all implants were stable and clinically osseointegrated and were connected with standard abutments (Conexão Sistema de Próteses). After impressions a total inferior fixed bridge was installed promoting a very nice restoration of masticatory, phonetic and aesthetic functions. Also, an orthodontic device was installed to prevent an atrophy and medial deviation of maxillary teeth.

Discussion

SCC rarely occurs in young patients, or less than forty years. Historical incidence of SCC in young adults was nearly 5% of oral cancers but recent data has shown that in some populations these cases have been more frequent every year². In contrast to older patients, significant pro-

It is related in literature that prognosis of young patients is generally worst when compared with their older counterparts². However the development of new techniques for treatment possibly will provide a better impact in this condition.

portion of the younger patients with oral SCC have never smoked or consumed alcohol.

It is related in literature that prognosis of young patients is generally worst when compared with their older counterparts². However the development of new techniques for treatment possibly will provide a better impact in this condition.

Besides there are not too many references in the literature, the impact in the quality of life in these young patients is huge. We can barely imagine the functional and psychological traumas to a 23-year old man to pass through cancer, to lose the tongue and all his teeth. After the oncological treatment the patient starts a different life with severe difficulties, as eating, speaking, and also maintaining his social and professional life as he/she was used to do before. Thus, it is very important to plan the rehabilitation at the same time of treatment, in order to provide not only cure, but also quality of life. The more aggressive treatment for oral cancer has improved control and survival time, but also increased the importance of functional and aesthetic rehabilitation.

Conventional removable prosthesis use has many restrictions in head and neck cancer patients as very poor retention, risk of trauma and sometimes ulcers that can lead to bone exposition and even osteoradionecrosis.

Dental implants were used for the first time in an irradiated patient in 1970 at Gothenburg University, Sweden,

and are a much studied subject. However, the results of osseointegration are limited due to irradiation, which have a negative effect on bone tissue⁶. The irradiated bone is characterized for the absence of osteoclasts what provokes delay in the bone resorption, micro-fractures containing fibrous tissue but without formation of callus, and three times more incomplete osteons and it is observed intra-bone ischemia, multiple emboli, extensive tissue hypoxia and cellular secondary destruction⁷. Granstrom⁵ evaluated the effect of irradiation dose expressed in cumulative radiation effect on implant survival, demonstrating that higher doses increased implant failures. The time from radiotherapy to implant surgery was also found to influence implant failures.

Although the risk of osteoradionecrosis is also an issue when considering endosseous implant installation, recently studies shows that the risk of this contraindication could be reduced when new surface implants and platelet enriched plasma is used. The search for new techniques and biomaterials that could increase the osseointegration process is a promising aspect of irradiated patients' rehabilitation. Different surfaces have also been studied showing better results in the integration process. According to Granstrom and Tjellstrom⁶ the size and surface of the implants can interfere with the prognosis. In our case, implants with nanotechnology surface, called vulcano surface, were used. Also in order to increase the

osseointegration, growth factors – in the form of platelet rich plasma (PRP) –, were used at the time of implant surgery. Bone tissue contains numerous growth factors with potent effects on bone cell metabolism, and it is possible to be said that the hypovascularization, hypoxia and hypocellularity caused by the radiation can be in part attributed to the reduction of growth factors implicated in the tissue regeneration, like the platelet-derived growth factor (PDGF) and transforming growth factor (TGF-beta) in biochemical level⁸. The blood platelets secrete such proteins, as PDGF and TGF-beta, and in PRP they can be increased in up to 338% after centrifugation⁹. So, the use of the PRP allows the enlargement of the concentrations of PDGF and TGF-beta, in the intention of increase the rate and quantity of bone neof ormation¹⁰. The results of this case show that under controlled procedures, osseointegration is achievable even in low bone quality in irradiated sites, improving the patient's quality of life.

Acknowledgements: the authors wish to thank Drs. Marcio Abrahão and João Santos Junior for contribution during surgical procedures and critical revision of the manuscripts.

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