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CASE REPORT

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Treatment of peri-implant mucosal fenestration with m-VISTA technique – a 2-year follow-up case report

Técnica m-VISTA no tratamento de fenestração em mucosa peri-implantar – relato de acompanhamento de 2 anos

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ABSTRACT

Background: The modified VISTA technique (modified Vestibular Incision Subperiosteal Tunnel Access) has been introduced as a minimally invasive approach for the treatment of gingival recessions. This technique could also be applied to managing peri-implant soft tissue defects (PSTD). **Objetive:** This case report presents a 2-year follow-up case in which the m-VISTA technique was used in the treatment of a class 1A PSTD. **Description:** A 66-year-old female patient complained of food accumulation and a non-aesthetic aspect in the peri-implant buccal region of tooth 11. On clinical examination, there was a peri-implant soft tissue defect, with a recession and fenestration of the buccal mucosa. A Cone Beam Computed Tomography (CBCT) was requested to complement the diagnosis, and a buccal bone defect was observed. Before the surgical phase, basic peri-implant therapy was performed. In surgery, the m-VISTA technique was used, seeking the slightest trauma to the soft tissues around the defect, especially the mucosal margin. The patient returned for suture removal after 14 days. Follow-ups were carried out in the first 14 and 21 days, 2 months, 6 months, and 1 and 2 years after surgery. **Results:** After two years, there was a complete closure of the peri-implant mucosal fenestration and complete coverage of peri-implant soft tissue recession. **Conclusion:** This 2-year follow-up case report showed the m-VISTA technique could be a successful approach in the treatment of a peri-implant mucosal fenestration and recession.

KEYWORDS

Case report; Dental implantation; Gingival recession; Oral surgery; Periodontics.

RESUMO

Contexto: A técnica VISTA modificada (Acesso ao Túnel Subperiosteal por Incisão Vestibular modificada) foi introduzida como uma abordagem minimamente invasiva para o tratamento de recessões gengivais. Esta técnica também pode ser aplicada ao tratamento de defeitos dos tecidos moles peri-implantares (DTP). **Objetivo:** Este relato de caso apresenta um caso de acompanhamento de 2 anos em que a técnica m-VISTA foi utilizada no tratamento de um DTP de classe 1A. **Descrição do caso:** Paciente do sexo feminino, de 66 anos de idade, queixava-se de acúmulo de alimentos e de aspeto não estético na região vestibular peri-implantar do dente 11. Ao exame clínico, verificou-se um defeito nos tecidos moles peri-implantares, com recessão e fenestração da mucosa bucal. Foi solicitada uma Tomografia Computadorizada de Feixe Cônico (TCFC) para complementar o diagnóstico, sendo observado um defeito ósseo vestibular. Previamente à fase cirúrgica, foi realizada terapia básica peri-implantar. Na cirurgia, foi executada a técnica m-VISTA, buscando o menor trauma possível nos tecidos moles ao redor do defeito, principalmente na margem mucosa. A paciente retornou para a remoção da sutura após 14 dias. Os acompanhamentos foram realizados nos primeiros 14 e 21 dias, 2 meses, 6 meses e 1

e 2 anos após a cirurgia. **Resultados:** Após dois anos, verificou-se o encerramento completo da fenestração da mucosa peri-implantar e a cobertura completa da recessão dos tecidos moles peri-implantares. **Conclusão:** Este relato de acompanhamento de 2 anos demonstrou que a técnica m-VISTA é uma abordagem que pode ser bem sucedida no tratamento de uma fenestração da mucosa peri-implantar e da recessão.

PALAVRAS-CHAVE

Relato de caso; Implante dentário; Recessão gengival; Cirurgia oral; Periodontia.

INTRODUCTION

Tooth loss is still a common outcome in the world's population, mainly due to the progression of periodontal disease and dental caries [1]. The use of dental implants has emerged as one of the main rehabilitation options for partially or totally edentulous patients [2,3], with the literature agreeing on their great predictability [4]. Nevertheless, implant therapy rehabilitation positively affects aesthetics and functionality, improving the patient's quality of life [5].

However, errors in diagnosis can lead to an inadequate treatment plan, which in turn can lead to the development of peri-implant hard and/or soft tissue defects, compromising the success of the therapy [6]. Peri-implant soft tissue defects (PSTD) are part of a group that includes mucosal recessions and fenestrations [7]. They can affect up to 50% of immediate implant cases [8] and are often associated with aesthetic and functional complaints [9].

PSTDs are highly prevalent; in fact, Bengazi et al. [10] reported an incidence of PSTD ≥ 1 mm in 57% of their patients 6 months after the dental implant installation. However, treating PSTD is still challenging for clinicians, especially because anatomical factors such as a lower number of cells and decreased vascularization can compromise tissue/graft nutrition and the healing process [11].

Two recent PSTD classifications were proposed [8,9]. Both emphasize the importance of considering the inherent characteristics of the tissue in the region of interest, such as the quality and quantity of keratinized mucosa, interproximal bone height, and the thickness of available tissue. Despite their valuable contributions to the clinical basis, there still needs to be more scientific evidence on the best technique/approach for conducting each case [12].

Several approaches have been proposed for the treatment of PSTD, such as the coronal flap surgery technique [13], tunnel, and the technique called m-VISTA (modified Vestibular Incision Subperiosteal Tunnel Access) [14]. This last is considered minimally invasive, as it avoids incision or trauma to the marginal gingival tissues to preserve the vascularization of the area to be treated [15]. Further, there is a consensus in the literature that the use of connective tissue grafts (CTG) is the gold standard in the context of these surgeries due to their biological characteristics [16].

Therefore, the purpose of this case report is to present a case in which the m-VISTA technique was used to treat a peri-implant mucosal fenestration and recession at the peri-implant buccal site (tooth #11).

CASE REPORT

A healthy nonsmoker 66-year-old woman, classified as a patient profile ASA I (American Society of Anesthesiology - ASA I is a health and not smoker patient), [17,18], attended a private dental practice in September 2020 and signed a consent form for the use of image. The patient's main complaint was aesthetic discomfort in the anterior peri-implant region. Clinical examination revealed a fenestration-type defect in the peri-implant vestibular mucosa in the area around tooth 11 (class 1 A) [8] (Figure 1A).

A Cone Beam Computed Tomography (CBCT) scan was then requested to visualize the soft and hard tissues. The image showed a slight interface between bone and implant in the buccal cortex (Figure 2). The treatment plan was then drawn up and a consent form was signed by the patient. Before the surgical phase, basic periodontal therapy was carried out, including decontamination of the implant in the exposed area.

Surgical technique - modified view

The graft recipient area was prepared using a Nº. 15 scalpel blade to make a single vertical incision extending to the periosteum in the distal region of tooth 12 at the height of the peri-implant tissue defect, maintaining the integrity of the

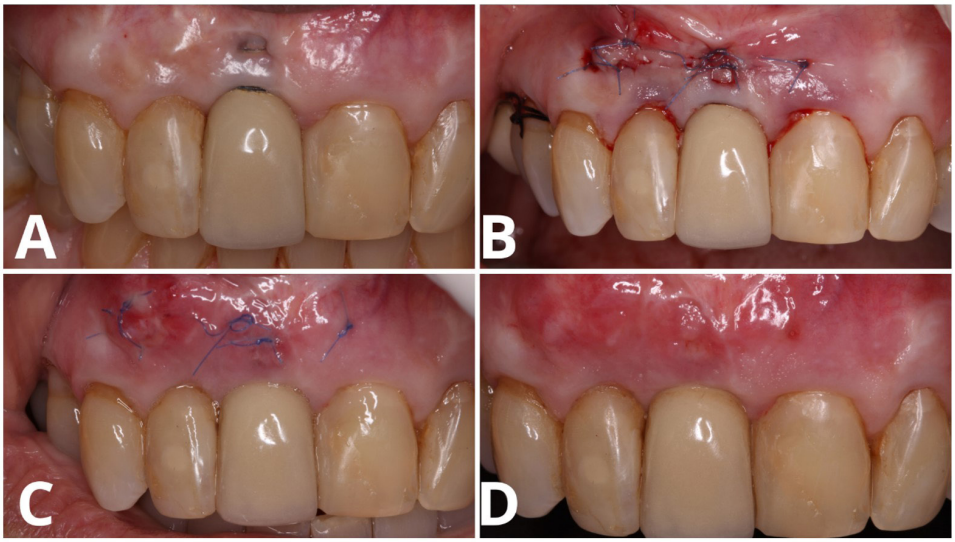

Figure 1 - Region of ED 11 With a PSTD classe 1A. A. Initial image pre-operatory in it is possible to see the fenestration defect and a recession causing exposure of the junction between the prosthetic abut- ment and implant leading to a non-aesthetic grayish appearance; B. immediate pos operatory aspect; C. 7 days follow up; D. 14 days follow up – where is possible to see the fenestration closure and an ini- tial coverage of the grayish aspect of the crown. Source: Authors.

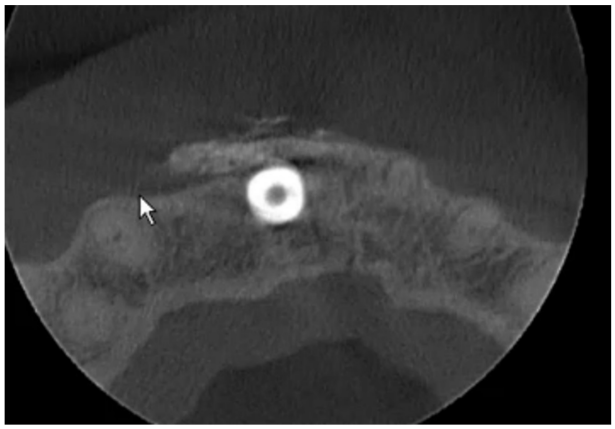

Figure 2 - Cone-Beam Computed Tomography (CBCT) axial section of the implant region of interest. A hypodense interface can be seen in the vestibular region between the implant and the bone. Source: Authors.

interdental papillae. From the incisions, a partial-thickness flap was carefully made using SB003 micro blades (MJK®, France) and Hu-Friedy® cable (Hu-Friedy, Mfg. Co. LLC, Chicago, USA), taking special care not to create traumas in the mucosal margin affected by the peri-implant defect. Using tunneling instruments (Hu-Friedy, Mfg. Co. LLC, Chicago, USA) a tunnel was created extending the region from tooth 13 to tooth 22 until a loose, tension-free gingival tissue was obtained. And, to obtain adequate closure of the wound, the edges of the fenestration were de-epithelialized using Hu-Friedy® curved surgical microscissors (Hu-Friedy, Mfg. Co. LLC, Chicago, USA).

Subsequently, a connective tissue graft (CTG) was obtained using the single incision technique. The CTG had approximately 2 mm of thickness and dimensions of 15x5 mm. The donor area received two hemostatic sponges (Hemospon®, Maquira, Brazil), which were sutured in X.

Then, the CTG was inserted into the flap previously made in the recipient area and sutured (Nylon Blue [Polyamide], 5-0, TechSuture Suturas Cirúrgicas®, Brazil) in order to obtain its stabilization and a homogeneous distribution. In addition, simple sutures were performed in the M-vista incision (Figure 1B).

After the surgery, the patient was instructed on oral hygiene and post-operative care and received post-operative prescriptions. A mouthwash with 0.12% chlorhexidine digluconate (Periogard, Colgate, Brazil) was prescribed for 30 seconds, twice a day, for 15 days; ibuprofen arginine 600 mg (Spidufen®, Zambon, Switzerland) 600mg for 3 days every 12 hours; and dipyrone monohydrate 1g (Novalgina®, Sanofi, France) every 12 hours in cases of pain.

Follow-up

After two weeks, the patient returned for an appointment to have the sutures removed (Figure 1C and 1D). After 14 days, the fenestration and part of the connection between the prosthesis and the implant, which had previously been exposed, were covered.

Follow-up appointments were also made at 21 days, 6 months, 1 and 2 years after surgery periods in which the adherence of the connective graft to the recipient area is progressively visible, thus forming a stable keratinized gingiva that follows the contour of the adjacent teeth and helps to promote healthy-looking peri-implant soft tissue in addition to covering the crown abutment (Figure 3A-3D).

DISCUSSION

The present case report shows a successful approach in the treatment of a peri-implant fenestration in the anterior maxilla region, which affected the pink aesthetic and compromised the implant's maintenance in the mouth. Using the m-VISTA technique, it was possible to observe the fenestration closure and the formation of peri-implant health tissue with adequate keratinized mucosa width and thickness, which also allowed the crown abutment to be covered.

Buccal surfaces in the anterior maxillary region are the areas most commonly affected by PSTD [19]. This is a challenging region for implant-supported rehabilitation due to exacting esthetic demands and difficult anatomy conditions. Adequate treatment planning regarding proper implant positioning, amount of keratinized mucosa, and bone thickness surrounding the implants is fundamental for favorable long-term maintenance of dental implants [20-22]. According to a cohort study with a one-year follow-up, after immediate implants in the anterior maxilla, cases with a buccal bone plate thickness ≤ 1 mm showed greater peri-implant changes compared to those with greater thickness [23].

The clinical case reported here shows a thin buccal bone wall and the presence of dehiscence (Figures 1A and 2). This possibly contributed to the appearance of fenestration and gingival recession in the peri-implant area and is in line with the literature [8,24]. In a recent systematic review, Monje and his team highlighted the important role of the thickness of the peri-implant tissues for the stability of the tissues surrounding the implant [24]. In addition to bone thickness, soft tissue thickness is also fundamental and is correlated with greater stability at the gingival margin, less marginal bone loss, and more satisfactory aesthetic results [25]. Therefore, in the case reported here, it was decided to correct the bone fenestration using connective tissue grafting in an attempt to cover the implant spirals exposed in the fenestration region.

According to treatment recommendations proposed by Zucchelli in the PSTD classification of 2018, defects class IA should be corrected by coronal advanced flap (CAF) or Tunnel technique (TT) associated with CTG of another substitute [8]. Because of the absence of the open flap, the VISTA or m-VISTA technique allows mobilization of the papilla and a coronal stabilization of the CTG. In a recent systematic review comparing the VISTA technique with other surgical techniques, the VISTA showed better recession coverage than

Figure 3 - A and B 21 days and 6 months follow up – is possible to see stability in the peri-implant soft tissue coloration and the and the continuity of the keratinized mucosal zone in relation to the adjacent teeth; C and D. 1 and 2 years follow up showing the stability of the graft and the peri-implant health condition. Source: Authors.

CAF and TT, and no differences were observed in terms of keratinized gingiva formation, probing deep, or clinical attachment level [26]. In the present case report, due to the peri-implant mucosal fenestration, it was desirable to avoid detachment of the papillae and minimal handling of the peri-implant margin. Therefore, the minimally invasive tunneling technique (m-VISTA) approach was performed.

It is estimated that 30% of installed implants are affected by peri-implant mucositis and 10% by peri-implantitis [27]. If not properly corrected, the lack of peri-implant tissue integrity can increase the risk of developing peri-implant mucositis and peri-implantitis. This is justified by the difficulty of maintaining good plaque control, leading to an increased risk of the development of peri-implant diseases [21]. In this context, adequate treatment planning should consider the bone and mucosa phenotype and prosthetic planning to avoid future peri-implant soft and hard tissue defects [21,27,28].

In addition to the functional importance of maintaining the integrity of the peri-implant tissues, there is also an aesthetic importance. A systematic review showed that patient satisfaction with implant-supported rehabilitations in the esthetic zone impacts their oral health-related quality of life [29]. There are also reports that in the peri-implant area, the patient's perception of pink aesthetics tends to be less satisfactory than that of the crown on implants [30].

CONCLUSION

The m-VISTA technique showed a successful approach in the peri-implant fenestration treatment during the two years follow-up. However, further studies should be carried out to consolidate the indication of this technique in peri-implant defects.

Author's Contributions

ESR: Conceptualization. GMP: Data Curation. VGBO, MIS: Formal Analysis. ESR: Funding Acquisition. GMP: Investigation. GMP: Methodology. ESR: Project Administration. SLPCL, ESR: Supervision. GMP, ESR: Visualization. GMP, VGBO, MIS: Writing – Original Draft Preparation. SLPCL, ESR: Writing – Review and Editing.

Conflict of Interest

No conflicts of interest declared concerning the publication of this article.

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Regulatory Statement

This case report was conducted in a private clinic and therefore does not have the approval of an ethics committee. However, the patient signed a consent form for the use of images and The Declaration of Helsinki was respected in all the stages.

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