

Healthcare meets Aesthetics: New approaches to the complex oral rehabilitations with implant-supported dental prostheses

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CASE STUDY

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ABSTRACT

Edentulism can lead to significant functional impairment as well as unfavourable aesthetic and psychological changes in patients. Main problems include restrictions in diet, speech impairment and loss of bone tissue in the zone where the teeth are missing. Many patients choose to retard the replacement of missing teeth for economic reasons, as they believe that overdenture prosthesis can mean poor quality or poor aesthetics.

The modern dentistry has greatly improved the quality of overdenture prosthesis on dental implants. Nowadays, such rehabilitative solution is considered as a fair compromise between economic and biological factors, without renouncing to top-quality aesthetics; but today we still need to stress the concept of good aesthetics as key-factor in improving the overall quality of life of our patients. The implant-supported overdenture can solve complex rehabilitative cases with a pretty easy prosthetic planning, ensuring highly-conservative surgery and great aesthetics, also thanks to the most advanced implants technologies and components.

In this clinical case, we will improve the function and

aesthetics in a patient that will benefit from a clinical and psychological point of view.

Key Words

Overdenture, dental implants, dental prosthesis

Implications for Practice:

1. What is known about this subject?

The correct prosthetic rehabilitation is important to replace the correct anatomy and function in edentulous patients.

2. What new information is offered in this case study?

These new aesthetic approach is useful to avoid the delay in the rehabilitation of edentulous jaws, in order to avoid anatomic and psychologic worsening.

3. What are the implications for research, policy, or practice?

Clinicians must consider the overdenture as a predictable and aesthetic solution, making patients able to choose the best solution.

Background

Rehabilitative treatments based on dental implants can improve the retention and stability of complete dentures in edentulous patients; the costs related to such treatments, however, are substantially increased with respect of removable prostheses.¹

The edentulism is related with several phenomena such as bone remodelling, tissues inflammation and cellular oxidative stress.² The smoking habits can be a disadvantageous factor in edentulous patients³ as well as all the stress related conditions.⁴⁻⁸

The total upper and lower edentulism represents a clinical challenge for every dentist; it must be properly approached, taking in mind the aesthetic requests of patients and their economic availability.

The edentulism can be related to many co-factors, as the periodontal diseases.⁹ The quality of life of edentulous patients¹⁰ subjected to implantology can be improved with the right prosthetic treatment and a proper management of gingival shape¹¹ and residual bone;¹² nowadays, the good treatment is both fixed and removable, depending from clinical and economic reasons. Scientific literature demonstrated that patients wearing a removable upper denture can quickly tolerate their new rehabilitative solution, mainly because it typically shows a good stability and makes patients feeling good; conversely, poor stability and masticatory problems are often reported in the lower removable prostheses, because of the complex anatomy of such site that favours a condition of instability.⁹⁻¹³

The overdenture mandibular prostheses on implants allow you to get many clinical benefits, such as good aesthetic, correct phonetic and speech, good prosthesis stability and correct masticatory movements.^{14,15}

The implant surgery is commonly performed in “safe” areas, such as the symphysis of the jaw, included into the two mental foramens; in such zone, the bone remodelling usually preserves enough amount of bone tissue, allowing to surgeons the correct positioning of 2 to 4 implants.

The overdenture (OVD) is an excellent dental prosthesis and its use is growing in the last years. The implant survival rate (ISR) ranges from 92 per cent to 100 per cent, regardless of the type of attachment used or the age of the patients. The surgical protocol to be preferred is the one-stage technique, especially in elderly patients or in patients affected from systemic diseases. The bone healing outcomes are similar to those reported after the two-stage technique, however, the one-stage technique needs only one surgery time, thus reducing the patients stress and allowing an overall costs and time reduction.

The modern implant-supported overdentures have been classified into two sub-categories:

- 1) Implant-retained mucosa-supported overdentures, retained by different abutment or bar designs.
- 2) Overdentures fully supported by implants.

The following article aims to show how a minimally invasive work can significantly improve the quality of life of our patients.

Case details

We treated a 65-year-old patient reporting a teeth loss due to a severe periodontitis. She was totally edentulous for a

long time and the radiological examinations revealed a strong resorption of the bony crest. Our patients showed the typical facial morphology commonly characterizing the edentulous patients: we found that the lips vermilion was almost completely unseen and nasolabial folds were deeper than other folds in different facial zones. Such a dramatic loss of vertical dimension was depending from the resorption of bony crest (Figure 1).

After a shared brainstorming with the patient, where we discussed about the clinical case and the therapeutic options, we decided to proceed with removable prosthesis rehabilitation, thus stabilizing the lower prosthesis with two interforaminal implants (Figure 2).

Implant surgery was performed with one-stage surgery, with a simultaneous screwing of the healing abutments, in order to shorten the treatment duration.

The lower denture was customized in order to fit with the implants position: we used a direct technique, properly perfected by using F.I.T.T. (Functional Impression Tissue Toner) gel to get a functional impression. When we choose to use this technique, it is preferable to check our patient within 48 hours after the application of F.I.T.T., in order to soften any rough edges created by the progressive hardening of this material.

According to the international guidelines, the stitches were removed after 7–10 days from the surgery: it's important to plan a follow-up every two weeks with the aim to modify the prosthesis, so to ensure an optimal healing of gingival tissues after the surgery.

Three months after the implant-surgery we are quite sure that the bone healing process is completed: we are thus ready to load dental implants with two low-profile attachments; in our case-report, we used OT Equator (Rhein83, Bologna, Italy) to stabilize the lower denture with a size measuring 2mm in the 4.3 positions and 1mm in the 3.3 position.

Two weeks after the positioning of the prosthesis, we performed an accurate follow-up to evaluate the aesthetic and function of the prosthetic rehabilitation: we recorded an excellent patient's satisfaction about her new denture, in fact, the good aesthetic and the restored chewing function led great benefit from a clinical and psychological point of view (Figure 3).

Patient's satisfaction has been recorded as previously

described,¹⁰ and with a personalized V.A.S. (Visual Analogue Scale), a measurement instrument aimed to measure in such case the satisfaction of patient, not easily directly measurable.

A successful prosthetic treatment is measured in the follow-up: compared to complex structures such as the implant bars, when we plan an overdenture supported by implants and mucosa, it is crucial to check whether the internal prosthesis profile is congruent with the profile of the edentulous ridge.

In our case, follow-ups have been performed up to four years, showing overdenture prosthesis stable and clinically performing. The bone around the implants remained quite stable, without signs of resorption, and the mucosal tissues around the implants remained in excellent health.

Discussion

Patients' life is rapidly increasing in expectations and duration; their requirements related to a prosthetic treatment are clear and peremptory: they need to have a fast, safe, practical, valuable treatment and, more than everything all; they require aesthetics at low cost.¹⁴⁻¹⁹

The literature analysis reports that a mandibular overdenture supported by two or more implants has a high implant and prosthetic success rate, moreover, the one-stage surgery and the modern materials allow to achieve good aesthetics in a short-time treatment; all such characteristics make the overdenture a highly valuable prosthetic treatment.¹³⁻²⁵

The concept of wellbeing has been variously reported in the literature: some authors reported the social role of piercing to make for example young people feel more acceptable from other friends, even if some problem is ever worthy to be considered;²⁶ and also patients with severe conditions^{27,28} should ever be rehabilitated to obtain an healthy oral cavity.

The positive feedback of the patient reported in our case is paradigmatic of the great versatility of overdenture, without renouncing to comfort and aesthetics, at cheap costs comparing to traditional prostheses. The change in aesthetics and function leads towards a complete amelioration of the overall quality of life of patients rehabilitated with a dental prosthesis. We strongly think that patient demands and needs are the principal reading key of our treatment, and everything must be built around such requests. For example, in this clinical case, only two

dental implants and a very good upper full denture have been charged on the treatment plan, offering to patient a low-expensive treatment with a high rate of success and an amazing increasing in the quality of life (Figure 4).

A spontaneous question could be: why, thus, we propose a prosthetic treatment supported by more than two dental implants? This is a question that would require a deep and complex discussion, and the reply is a sum of anatomic, functional and aesthetic factors; however, in some cases, the reply could fatally be only related to the research of the best starting conditions, to ensure a durable rehabilitation during time. In this reported case, if we had opted for upper and lower fixed prostheses, we would have ensured function, of course, but not the aesthetics and the predictability of the long-time outcomes. In fact, a fixed prosthesis needs specific requirements related to the maintenance of a proper hygiene, consequently, the perioral tissues would not have the right support. This last aspect is particularly important in the upper prostheses, because of their need to concretely support the upper lips. In our clinical case here reported, the lower jaw would have been rehabilitated by a fixed prosthesis on not less than four implants, but it would not have been the best treatment for our patient, because she required an aesthetically guided work and a rehabilitative solution easy to clean. Single attachments are instead the gold standard in our reported case, because they allow an easy hygiene without complex cleaning manoeuvres.

Conclusion

In our case report, the "take-home-message" is that the mandibular implant-supported overdentures can be a reliable and predictable prosthetic choice, in such edentulous patients with low economic budget and high aesthetic expectations. The treatment must be carefully planned and shared with patients and dental technicians. Our main goal is to provide an adequate support to the perioral soft tissues, in fact, the loss of hard and soft tissues in edentulous patients can be severe.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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PATIENT CONSENT

The authors, *Scrascia R, Venezia P*, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.

Figure 1: The baseline radiological condition of our case



Figure 2: The prosthetic solution allowing to obtain good aesthetics and performance



Figure 3: Our patient before and after our implant-prosthetic rehabilitation



Figure 4: Each step of this case report. Reported inside a 4-years follow-up orthopantomogram x-ray

