



EDITORIAL

Cost-benefit and affordability of dental implant restorations.

Nowadays, dental implants are well established in the daily practice and are well known and accepted by the public. They allow anchorage of removable as well as fixed dental prostheses in a predictable way. Efforts of scientists in collaboration with implant industry has led to a continuous improvement in clinical outcome thanks to the modification of implant surfaces, implant design and prosthetic connections. Together with a better understanding of biology, these developments yield less implant failures despite the usage of implants in compromised condition or risk patients.

In their consensus reports, the EAO stressed the need for additional research in the field of patient-centered outcomes including the economic impact of implant-restorative treatments¹. 'Patient-centered' captures a number of parameters that are not always objectively measurable in contrast to eg. implant survival, bone loss, peri-implant health and incidence of complication. Patient-centered outcome variables pertain among others to patient satisfaction with a given treatment, the improved masticatory ability and aesthetic appreciation, the absence of speech problems and the subjective evaluation of oral health related quality of life. In the light of a growing interest in health economics more interest is also paid to cost-benefit of tooth replacements. In industry it is defined as an economic analysis that assigns a numerical value to the cost to make a product or deliver a service. Additionally, it accounts for the direct benefit to the individual or the society including the revenue it generates in the long run. Of course this definition is difficult to handle when discussing dental or medical care. Here it is more related to the resource expenditures relative to possible medical benefits such as longer survival, less pain or morbidity and more comfort. It is often related to "making the best choices by using the limited resources" and it weighs the potential for undesirable outcomes and side effects, against the potential for positive outcome of a treatment. A cost-benefit analysis will capture these aspects together with the economic input required in terms of chair-time, patient-related time, cost involved in

handling complications and patient's expectations and preferences. It has become a part of the process of determining the necessity in delivery of qualitative care and it brings the patient to the center of decision making. In dental science, these aspects are largely uncovered.

In the context of implant treatment it is well established that edentulousness and complete denture wearing has a negative impact on a number of physiological, functional and psychosocial parameters. Those influence oral functions and aesthetics but also satisfaction, self-esteem, body image and quality of life². Consequently, improving the retention of a denture by fixation on 2 to 4 implants or the fixation of a complete fixed dental prosthesis on 4 to 6 implants has a tremendous effect on the oral health related quality of life. However, adaptation to tooth loss varies individually and many patients cope very well with less teeth and do not always feel the need for replacements, let alone with dental implants. In the European society, the demand for tooth replacement is more and more decided upon normative and theoretical grounds and not always based on a specific patient assessment. Also clinicians are often stuck in dogmatic, non-evidence based, thinking. Often they impose their personal view in regard of the suggested treatment option. Some examples to illustrate the latter are: the beliefs in long implants; bone grafting instead of short implants; the more implants the better; overdentures on connected implants; ceramics better than acrylic teeth; aesthetics by all means.

Long-term clinical studies show that a single implant yields the best option for a missing tooth. It yields a bigger initial cost but has an above 95% survival and can be considered more cost effective than a 3-unit conventional bridge³. Also implant-retained overdentures are worth the price given the increase in quality of life and treatment satisfaction. When patient's resources are limited, the 2 implant solution is a better option from a cost-benefit point of view than a fixed dental prosthesis of 4 to 6 implants.

Unfortunately the economic condition of the patient



imposes a huge barrier on the treatment choice. Although dental implants have become a mass product, the price does not reflect the normal economic evolution of price reduction. On the contrary, prices rise up yearly. The high-tech evolution of three-dimensional radiographic analysis, the use of guided stereolithographic surgery, need for individualized aesthetics, more commonly used additional regenerative procedures have all further increased the total cost. Although these techniques offer the possibility to facilitate surgery and enhance aesthetics, the cost aspect is seldomly taken into account. One can also question whether this is not leading to exclusive treatments for the happy few? In the European community alone, every year close to one million patients become completely edentulous. It is unlikely they can afford dental implants. Research from Austria⁴ revealed that 'the man in the street' considers implants as too expensive and they blame the dentist for the high price. Additionally 59% of the patients also expected a life-time longevity! A previous study showed that 23% of the patients would never opt for implants at all⁵. Another study assessing treatment advice given after tooth extraction by Flemish general dentists in the city of Gent, demonstrated that in 42% of the cases replacement was not suggested. Of the remaining cases 54% opted for a removable appliance and only one fifth received advice for a single implant crown. It seemed that highly educated patients were more likely to receive a single implant, probably on grounds of financial solvability. Hence, despite evidence that the single implant is the best cost-effective way

to replace a missing tooth, it is seldomly advised. It is obvious that other patient's and clinician's arguments prevail in the decision making process⁶.

Given the current economic situation, dental health care expenditure will probably slow down or even go down. With budget cuts and savings deemed necessary in the EU for the coming decade, an insecure situation or perception by many patients will require difficult choices. In many countries national health or private insurances seldomly support implant prostheses leading to large groups of patients in need for replacements but without economic means to pay for them. The remaining ones can afford dental implants but are known to be super critical and have high expectations even close to unrealistic.

It is a challenge for the clinician of tomorrow to cope with these economic factors and still be a doctor for as many patients as feasible. The clinician should advise the patient which treatment option is preferable based on individual risk assessment but the patient's preferences including the financial solvability and the long-term cost-benefit aspects are gaining importance and can not be neglected.

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REFERENCES.

1. Albrektsson T, Donos N; Working Group 1. Implant survival and complications. The Third EAO consensus conference 2012. *Clin Oral Implants Res.* 2012; 23(Suppl 6): 63-5.
2. Vogel R, Smith-Palmer J, Valentine W. Evaluating the health economic implications and cost-effectiveness of dental implants: a literature review. *Int J Oral Maxillofac Implants.* 2013; 28(2): 343-56.
3. Bouchard P, Renouard F, Bourgeois D, Fromentin O, Jeanneret MH, Beresniak A. Cost-effectiveness modeling of dental implant vs. bridge. *Clin Oral Implants Res.* 2009; 20(6): 583-7.
4. Hof M, Tepper G, Semo B, Arnhart C, Watzek G, Pommer B. Patients' perspectives on dental implant and bone graft surgery: questionnaire-based interview survey. *Clin Oral Implants Res.* 2014; 25(1): 42-5.
5. Pommer B, Zechner W, Watzek G, Ulm C, Watzek G, Tepper G. Progress and trends in patients' mindset on dental implants. II: implant acceptance, patient-perceived costs and patient satisfaction. *Clin Oral Implants Res.* 2011; 22(1): 106-12.
6. Cosyn J, Raes S, De Meyer S, Raes F, Buyl R, Coomans D, De Bruyn H. An analysis of the decision-making process for single implant treatment in general practice. *J Clin Periodontol.* 2012; 39(2): 166-72.