



**Evaluation of the aesthetic outcome of implant single-unit restorations with titanium and zirconia abutments using aesthetic indexes – a pilot study**

---

**Ana Catarina Fernandes da Costa**

Integrated Master in Dentistry

Faculty of Medicine of University of Coimbra

**Supervisor:** Professor Doutor Fernando Guerra

**Co-Supervisor:** Mestre Doutor João Paulo Tondela

Coimbra, July 2014



*"Here's to the crazy ones. The misfits. The rebels. The troublemakers. The round pegs in the square holes. The ones who see things differently. They're not fond of rules. And they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them. About the only thing you can't do is ignore them. Because they change things. They push the human race forward. And while some may see them as the crazy ones, we see genius. Because the people who are crazy enough to think they can change the world, are the ones who do."*

Steve Jobs

Faculty of Medicine of University of Coimbra

Integrated Master in Dentistry

**Evaluation of the aesthetic outcome of implant single-unit restorations with titanium and zirconia abutments using aesthetic indexes – a pilot study**

Costa AC\*, Tondela JP\*\*, Guerra F\*\*\*

\*Undergraduate student of the Integrated Master in Dentistry, Faculty of Medicine University of Coimbra

\*\* DDS, MsS, Assistant Professor, Fixed Prosthodontics and Oral Rehabilitation, Faculty of Medicine University of Coimbra

\*\*\*PhD, Professor and Director of Graduate Prosthodontics, Fixed Prosthodontics and Oral Rehabilitation, Faculty of Medicine University of Coimbra

Área de Medicina Dentária, FMUC, Coimbra - Portugal

Avenida Bissaya Barreto, Blocos de Celas

3000-075 Coimbra

Tel.: +351 239 484 183

Fax: +351 239 402 910

Electronic mail: [catarinafcosta@gmail.com](mailto:catarinafcosta@gmail.com)

## INDEX

Abstract .....	5
Abbreviation list .....	6
1. Introduction.....	7
1.1 Objectives .....	9
2. Materials and Methods .....	10
2.1 Patient selection .....	10
2.2 Subjective assessment.....	10
2.3 Control visit Protocol.....	10
2.4 Photographic collection.....	12
2.5 Clinical analysis .....	13
2.6 Diagnostic cast collection and assessment .....	14
2.7 Aesthetic outcome assessment – Objective indexes.....	14
2.8 Limitations to the procedures.....	17
2.9 Statistical analysis .....	18
3. Results .....	19
3.1 Agreement between clinical and photographic ratings .....	52
3.2 Clinical vs. Photographic evaluations .....	53
3.3 Comparison between indexes .....	54
3.4 Aesthetic predictive factors.....	55
3.5 Aesthetic outcome of zirconia and titanium abutments .....	56
3.6 Patient satisfaction.....	57
4. Discussion .....	58
4.1 Protocol.....	58
4.2 Patient satisfaction.....	59
4.3 Comparison between indexes .....	59
4.4 Specialization groups.....	59
4.5 Assessment method .....	59
4.6 Aesthetic predictive factors.....	60

4.7 Aesthetic outcome of zirconia and titanium abutments .....	60
5. Conclusions.....	61
6. Study limitations and Future perspectives.....	62
7. References .....	63
8. Acknowledgments .....	65
9. Annex .....	66
9.1 Annex 1: Informed consent.....	66
9.2 Annex 2: VAS .....	74
9.3 Annex 3: Clinical aesthetic assessment .....	75
9.4 Annex 4: Clinical analysis .....	76
9.5 Annex 5: Aesthetic assessment grid.....	77
9.6 Annex 6: Explanation of indexes .....	78
9.7 Annex 7: Reminder of indexes.....	83

## ABSTRACT

**OBJECTIVES:** Compare the aesthetic outcome of patients receiving one single-unit implant restoration in the aesthetic zone with titanium or zirconia abutments by means of aesthetic indexes and the subjective evaluation of the patients' satisfaction.

**MATERIALS AND METHODS:** The list of patients who received dental implants in the Dental Clinic of the Faculty of Medicine of University of Coimbra between 2005 and 2012 was reviewed and those who fulfilled the eligible criteria were asked to participate: (1) One single-unit implant restoration in the aesthetic zone (14-24) *in situ*, (2) with titanium or zirconia abutments and (3) natural adjacent and contralateral teeth. All gave their opinion regarding the aesthetic outcome of their situation through a Visual Analog Scale (VAS). The control visit consisted of taking a radiograph, photographs, filling in a clinical aesthetic assessment grid and impressions. The same investigator responsible for the collection of the information above evaluated the aesthetic outcome, both clinical and photographically. The photographs were handled to several professionals and students of the Dental Clinic, along with a grid similar to the one used clinically and a document explaining the indexes used (the *PES/WES*, the *ICAI* and the *CIS*), in order to measure the specialization effect.

**RESULTS:** There is considerable agreement between the two evaluations (clinical and photographs), as well as a correlation between the evaluations given clinically and the mean score of those given based on photographs. According to this pilot study, the *PES/WES* index is the one with most internal consistency (Cronbach's  $\alpha=0.85$ ); Aided by the software Amos, the soft tissue contour (0.78), the soft tissue level (0.68), the colour (0.8) and characterization of the crown (0.76), the position of the vestibular margin of the peri-implant mucosa (0.6), the colour and surface of the mucosa (0.54), symmetry/harmony (0.8) and colour of the crown (0.78) are the most influential parameters regarding the aesthetic outcome (RMSEA=0.019); The cases with zirconia abutments were assessed as being more aesthetic than the ones with titanium abutments.

**CONCLUSION:** (1) Within the limitations of this pilot study, the *PES/WES* index appears to be the most consistent and probably the best to be implemented for the aesthetic outcome assessment of implant single-unit restorations. However, it lacks aspects related to overall aesthetics, such as the evaluation of lip line and considerations regarding the smile and facial harmony; (2) The protocol proposed is suitable to be employed when planning future rehabilitations and their subsequent assessment; (3) The most influential aspects should probably be those to which professionals should give more emphasis when planning an implant-single unit restoration to ensure its successful aesthetic outcome.

**KEY-WORDS:** aesthetics, implant single unit restoration, titanium abutments, zirconia abutments, Pink Esthetic Score (PES), White Esthetic Score (WES), Implant Crown Aesthetic Index (ICAI), Copenhagen Index Score (CIS), peri-implant soft tissue

## **ABBREVIATION LIST**

CDA – California Dental Association

CIS – Copenhagen Index Score

ERA – Esthetic Risk Assessment

FDI – Fédération Dentaire Internationale

ICAI – Implant Crown Aesthetic Index

ITI – International Team of Implantology

JPEG – Joint Photographic Experts Group

PDP – implant Position, implant Design, prosthetic Design

PES/WES – Pink Esthetic Score/White Esthetic Score

RCT –Randomised Clinical Trial

RMSEA – Root Mean Square of Approximation

SAC Assessment tool – Straightforward Advanced Complex Assessment tool

SEM – Structural Equation Modelling

US- ultrasonic

VAS – Visual Analog Scale



## 1 - INTRODUCTION

Implant single-unit restorations as a valid treatment option when compared to conventional fixed dental prosthodontics may be explained due to its highly predictable results in terms of osseointegration and straightforward restorative procedures (1–9). Besides, it takes into consideration the beliefs of modern Dentistry as it constitutes a conservative procedure, as far as it excludes the sacrifice of a sound tooth. Its ultimate challenge is to replace the loss of hard and soft structures, as well as function and aesthetics, therefore mimicking the unrestored, healthy tooth and its bony and soft tissue surroundings (10). Preferably, the implant crown and the peri-implant soft tissues should be in balance with the neighbouring teeth and in harmony with the soft tissues around the adjacent teeth, respectively (11), which means that along with the appearance in terms of colour, shape and texture of the implant crown, the preservation or creation of pleasant soft tissue contours of the peri-implant mucosa, with distinct papillae, play an important role in overall aesthetic outcome, contributing to a “natural” look (6,7). The available procedures that contribute to aesthetic implant success are not always predictable, which means that prerequisites such as an adequate bone volume, an optimal implant position, a stable and healthy peri-implant soft tissues and its contours, and an ideal emergence profile are considered essential (12). Given all the above, the authors can state that the aesthetic integration of an implant single unit restoration frequently constitutes a challenge, which is a problem given that nowadays, patients consider aesthetics to be a critical factor, often giving more emphasis to it than to the functional aspect of a dental implant (11).

For many years in scientific research, aesthetics was poorly documented and not included in the success criteria (13). This can indicate that implant success rates that incorporate an aesthetic evaluation are considerably lower than implant survival rates *per se* (13). When we refer to aesthetic scoring, well-defined objective parameters are required concerning the peri-implant mucosa and the crown. Indices that score the colour, shape and level of the implant's mucosa and the crown restoration are important for identifying not only long-term changes, but also to operate as a quality regulator of the procedures that led to the current aesthetic outcome, aiming for an improvement in treatment outcome (1,14,15). Over the years, several indices were proposed and modified: Belser and colleagues, in 2009, proposed the Pink and White aesthetic scores (*PES/WES index*) as a modification of the *PES* proposed by Furhauser and colleagues in 2005. This newer index measures both parameters concerning the peri-implant mucosa and the implant crown restoration, as the *WES* highlights the visible part of the implant restoration itself (16). Another index proposed was the *ICAI* (Implant Crown Aesthetic Index), by Meijer and colleagues in 2005. This rates simultaneously the prosthetic part of the implant restoration and the peri-implant mucosa (14). Later on, this index was modified (*mod-ICAI*) regarding the penalty points for major/gross deviations, as *ICAI* gave a score of five and *mod-ICAI* gives a score of two. The Copenhagen Index Score (*CIS*) was created at the Dental School in Copenhagen originally for the quality evaluation of the implant rehabilitation performed, based on the papilla index score (Jemt 1997) and the *CDA* index (California Dental Association 1977), with some modifications having been made in order to make it appropriate for assessing implant-supported crowns and feasible for clinical setting (15).

As mentioned before, patient satisfaction regarding the rehabilitation constitutes a major success criterion. However, objective criteria do not necessarily reflect the patient's opinion (17). Therefore, subjective evaluation, in which patients report on aesthetics and comfort and where he/she can express his/her satisfaction and any deficiencies that may exist, contributes to the concept of successful implant treatment (17,18), but does not give any information associated to possible sources of errors (3).

The available literature regarding objective aesthetic outcome evaluation, points out that the colour and texture of the peri-implant soft-tissue are the parameters that fare worst when analyzed by dental professionals from several specializations, indicating that these variables should be given more attention when aiming for an aesthetic success (10,13,16,18–20). This is one of the reasons why, in anterior regions, the selection of the abutment material constitutes an important factor, with its choice being mainly influenced by the gingival biotype, the expectations of the patient and the aesthetic goal to be achieved (4,5). As far as the gingival biotype is concerned, the literature suggests that a thick biotype is a desirable characteristic that positively affects the aesthetic outcome of an implant-supported restoration, because thick soft tissue is more resistant to mechanical and surgical insults and less susceptible to mucosal recession, and has more tissue volume for prosthodontic manipulation (21). Even though gingival biotype is a characteristic feature inherent of each patient, it can be transformed through narrow management of the implant position, implant design and prosthetic design, as suggested by Fu and colleagues as the PDP management triad (implant position (P), implant design (D), and prosthetic design (P)), so that the desired aesthetic outcome is achieved (21).

Regarding the abutment material, for years, titanium was considered the gold standard for implant restorations independently of its position in the mouth, due to its excellent material stability and biological integration (5). Unfortunately, the blue-greyish shimmering of such abutments jeopardized the aesthetic outcome in cases with thin biotype and caused a noticeable colour difference from the gingival tissues of the neighbouring teeth. This is why alumina abutments were introduced, although it was observed that they occasionally fractured, since ceramics are brittle and tend to undergo dynamic fatigue (5,10). The use of partially stabilized zirconia ( $ZrO_2$ ) abutments has become more popular in recent years, especially in regions of high aesthetic demand. These abutments combine high bending strength and toughness with good biocompatibility (10). The limited amount of data available suggests that the clinical performance is comparable with that of titanium abutments (22). The phenomenon of aging is considered to be one of the most decisive factors when it comes to the choice of zirconia. The existing clinical data is limited to a period of 5 years of observation, so the relationship between aging of zirconia frameworks and the long-term clinical performance has not been proven so far (22). As with alumina abutments, the white colour of zirconia is considered aesthetically advantageous, though some consider it to be too white and it is suggested that more tooth coloured abutment materials are preferable (10). In a study conducted by (Bressan *et al.* 2010)(20) where they measured the colour of the peri-implant soft tissue with each type of abutment at the time with aid of a spectrophotometer, the results showed that there was a significant difference between the colour of the peri-implant soft tissue and the colour of the gingiva around natural teeth, no matter which abutment material was used. However, the peri-implant soft tissue around zirconium oxide abutments appeared to be significantly

closer to the colour of natural teeth gingiva compared to titanium. Again, selection of the ideal abutment material is influenced by a combination of several clinical factors and material-specific mechanical and optical characteristics (5).

#### 1.1 - OBJECTIVES

The aim of this pilot study (retrospective) was to compare the aesthetic outcome of patients receiving one single-tooth implant restoration in the aesthetic zone with titanium or zirconia abutments restored with metal ceramic and all ceramic crowns, respectively, by means of aesthetic indexes and the subjective evaluation of the patients' satisfaction. The null hypothesis of this investigation is that, despite the material selected, the restorations are indistinguishable when it comes to the objective/subjective comparison of aesthetic outcome and that, subsequent to objective/subjective analysis, zirconia abutments achieve the same aesthetic outcome when compared with titanium abutments.

## 2 - MATERIALS AND METHODS

### 2.1 - PATIENT SELECTION

The list of patients who received dental implants in the Dental Clinic of the Faculty of Medicine of University of Coimbra between 2005 and 2012 was reviewed and those who fulfilled the following eligible criteria were asked to participate in the study: (1) One single-unit implant restoration in the aesthetic zone (14-24) *in situ*, (2) with titanium or zirconia abutments and (3) natural adjacent and contralateral teeth. The finding of patients turned out to be a challenge, since the list mostly informed that a implant rehabilitation had been made, and lacked information about its position, the material of the abutment and crown, or if it was a single or multiple implant rehabilitation. The patient's clinical file did not reveal any further information. Thus one of the authors had to search individually on the receipt list of the Dental Clinic concerning the filling of these gaps. Moreover, in order to obtain information about the materials used, the authors contacted the dental laboratories with whom the Dental Clinic worked during the years mentioned above.

All patients were informed about the characteristics of the study and signed an informed consent (*Annex 1 – Informed consent*).

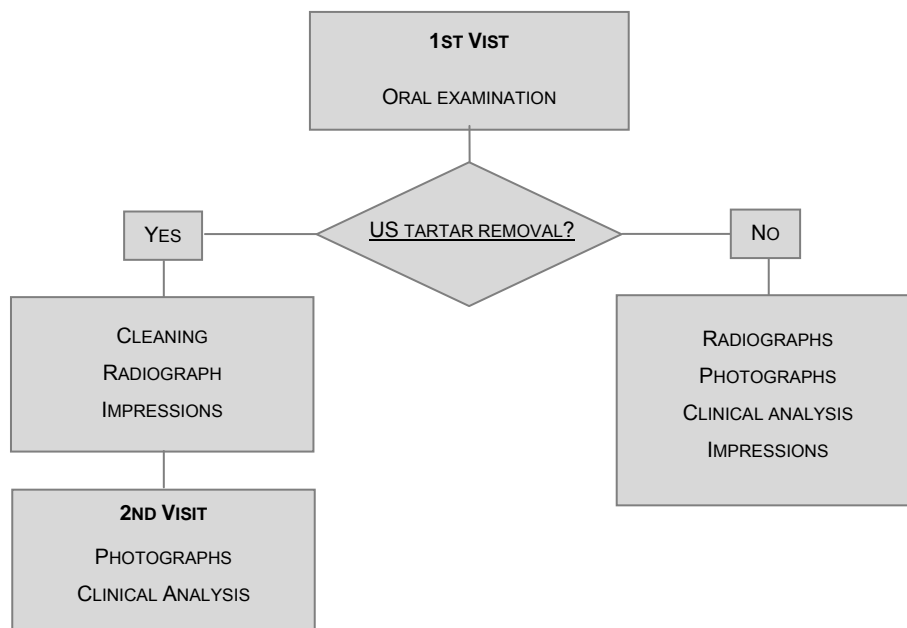
### 2.2 - SUBJECTIVE ASSESSMENT

Before clinical examination, patients were given a structured questionnaire (*Annex 2 - VAS*), in which their satisfaction with both colour and shape of the prosthetic portion of the implant and its surrounding soft tissues was evaluated. Patient satisfaction was assessed using the Visual Analog Scale (VAS), as this is recommended as a subjective measure of implant aesthetics. The VAS consists of a 10cm long line representing the spectrum of agreement between 0% (indicating total discontent/very bad aesthetics) and 100% (indicating total satisfaction/very good aesthetics). Furthermore, patients were asked whether they would repeat the treatment, if necessary, and whether they would recommend it to others.

### 2.3 - CONTROL VISIT PROTOCOL

The investigators created the following protocol, in order to maximize the use of time and the gathering of the information required; all the procedures were executed by the same operator. Firstly, a brief oral examination was made to evaluate oral hygiene levels and to determine the necessity of ultrasonic (US) tartar removal. If it was, photographs, radiographs and clinical analysis were postponed for a second visit and impressions were made after the cleaning. If it was not necessary, then a radiograph was taken, followed by photographs, clinical analysis and lastly, impressions. This protocol is illustrated in Diagram 1.

DIAGRAM 1 – ORGANIZATION OF THE CONTROL VISIT



The radiographs taken were not standardized, as their only purpose was to identify cases of peri-implantitis. The technique employed was the bisecting-angle technique, which is based on the principle of positioning the x-ray beam perpendicularly to an imaginary line resulting from the angle formed by the long axis of the tooth and the plane of the film.

The clinical analysis consisted of filling in two documents, one for the assessment of the aesthetic outcome (*Annex 3 – Clinical aesthetic assessment*) and the other for the evaluation of clinical criteria, such as bleeding on probing, probing depth and gingival biotype (*Annex 4 – Clinical analysis*). After collecting all the information from the patients, the same investigator re-assessed the photographs printed on photographic paper in a 15x10cm format, and filled in a document identical to the one used clinically (*Annex 5 – Aesthetic assessment grid*). This analysis was also handed to dental technicians, students and dentists of several specializations of the Dental Clinic of the Faculty of Medicine of University of Coimbra (Prosthodontists, Orthodontists, Periodontologists and others) and they were asked to assess the aesthetic outcome by means of the same photographs, with the implant supported crowns identified with arrows. Prior to that, they received a document explaining the employment of the indexes (*Annex 6 – Indexes explanation*), so that all circumstances were the same, as much as possible. In order to assist during the assessment, a simplified version of how to use the indexes was also made available (*Annex 7 – Reminder of the indexes*). This assessment was made only once. For this objective measurement, the study design was single-blinded, with the observers unaware of the group of abutment materials they were analyzing. These observers were randomly selected, as the first to accept and to be available for the execution of the assessment.

## 2.4 - PHOTOGRAPHIC COLLECTION

The equipment used was as follows: a Canon EOS 60D camera, an EF 100mm F/2.8L Macro IS USM lens and a Macro Ring Lite MR-14EX. Photographs were taken using JPEG and RAW file format. Given that light conditions were not the same, the investigators tried to standardize their colour by means of a white balance card (WhiteBal<sup>®</sup>) and set the white balance after the photograph was taken. RAW files allowed this adjustment with the use of Adobe<sup>®</sup> Photoshop<sup>®</sup> Lightroom<sup>®</sup> 5.3.

Three photographs were essential for the evaluation: one extraoral with the patient smiling in maximum intercuspal position and two intraoral: frontal and occlusal, with this one useful to analyse the volume. The settings employed are displayed in Table I, for both extraoral and intraoral photographs.

**TABLE I - SETTINGS**

EXTRAORAL	INTRAORAL
F/20	F/22
SHUTTER SPEED - 1/125	SHUTTER SPEED - 1/160
ISO 1250	ISO 100
FLASH 1/1	FLASH 1/4
FOCUS 3 METERS	MAGNIFICATION 1:3
TEMPERATURE 5700K	
NEUTRAL COLOURS	
FOCAL POINT (CENTRE OF THE TOOTH IN CASE)	

The major issues of the authors concerned the position of the head in the extraoral photograph and how to correlate the information from extraoral to the intraoral photographs. In order to standardize the photographs, the position of the camera was the same for all patients. A tripod was used to stabilize shooting and the inclination of the camera was controlled by its own internal level and an external bubble level located on the tripod. To place the head and take the extraoral photograph, the option “Grid 2” (option of the camera) was selected and a vertical and horizontal line matched the middle and interpupillary lines. To improve the quality of the photographs, a white background was used. For the intraoral photographs, a single-ended plastic retractor helped move the cheeks away from the teeth. For the occlusal photographs, the patients sat in the dentist chair, in a reclining position, and a photograph perpendicular to the occlusal face of the teeth was taken.

To make the assessment of anterior tooth replacements possible, the reference tooth (i.e. contralateral tooth in the incisor and canine zone and the adjacent tooth in the premolar zone) had to be visible enough to ensure comparison; if not so, a separate photograph would be taken from the contralateral tooth, for a more detailed evaluation. As to the first premolars, both canine and second premolar had to be included in the photograph. All photographs were developed and processed by the same person.

## 2.5 - CLINICAL ANALYSIS

This step combines the aesthetic outcome assessment through the employment of objective indexes, based on a clinical evaluation of the patients, as well as the appraisal of biological factors, patients' lip line and gingival biotype.

The variables related to biological factors were recorded at the site of the implant-supported restoration and reference tooth by the same investigator:

- *Probing Depth*: measured to the nearest 0.5mm at four sites per implant (mesial, midfacial, distal and palatal), using a manual periodontal probe (Williams). The highest value was recorded;
- *Bleeding on probing*: percentage of bleeding on probing measured at four sites per implant (mesial, midfacial, distal and palatal). This was evaluated as present or absent;
- *Implant mobility*: measured clinically by applying pressure with two metal instruments. This could be rated as having:

Normal mobility (as we are referring to implants, no mobility is expected);

Grade I: Slightly more than normal (<0.2mm horizontal movement)

Grade II: Moderately more than normal (1-2mm horizontal movement)

Grade III: Severe mobility (>2mm horizontal or any vertical movement)

“Lip Line” and “Gingival Biotype”, among other parameters, are part of the criteria used in the SAC Assessment tool developed by the ITI, in order to execute the Esthetic Risk Assessment (ERA). They define “Lip Line” as the level to which the patient exposes the implant restoration and its surrounding mucosal tissues during function and smiling, whereas “Gingival Biotype” regards soft tissues thickness. For that reason, the authors considered it essential to include them as an integral part of the clinical analysis. As far as the lip line is concerned, we can be facing a situation of no exposure of papillae, exposure of papillae or a full exposure of mucosa margin. With regard to the gingival biotype, three options are also possible: either thin, medium-thick or thick. The following pictures serve as an example of these variables.

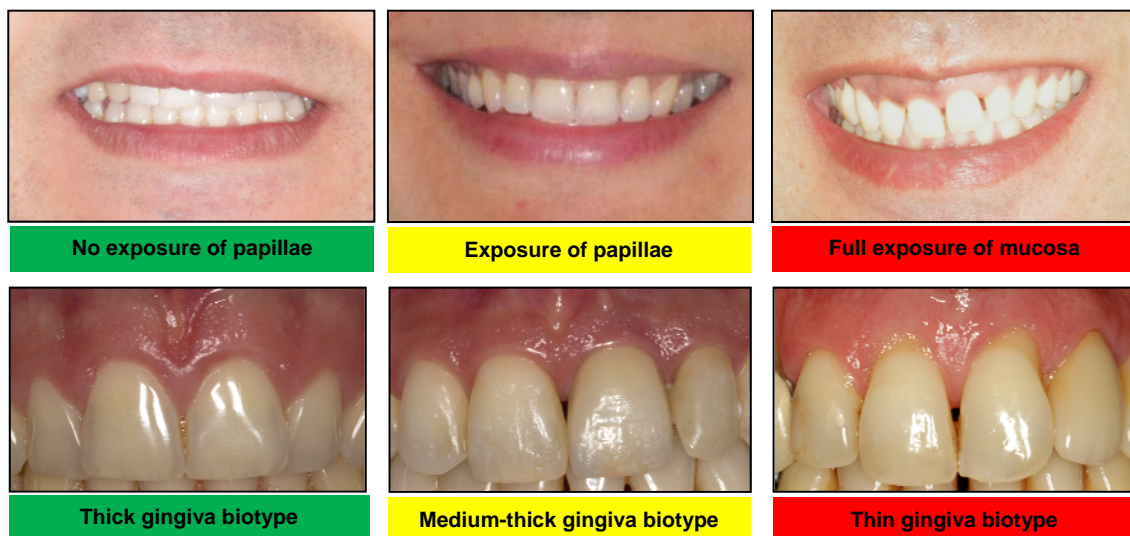


FIG. 1 – LIP LINE (ABOVE) AND GINGIVAL BIOTYPE (UNDER)

According to Olsson and Lindhe (1991), a thick biotype consists of a broad, slightly scalloped marginal gingiva with bulky underlying bony architecture associated with short and quadratic teeth. Conversely, a thin biotype consists of a highly scalloped marginal gingiva with thin underlying bone and a narrow tooth form. For the measurement of the gingival biotype, the periodontal probing approach was chosen. This consists of a non-invasive method, easily reproducible and relatively objective, in which a periodontal probe is introduced in the buccal gingival sulcus and the transparency of the mucosa is evaluated. In the present study, this technique was executed at the peri-implant mucosa. If the probe turned transparent through the gingiva, this categorized the biotype as thin; if the probe could not be seen, it was classified as thick. A medium-thick gingiva was seen as a medium-term of both classifications(23–25).

## 2.6 - DIAGNOSTIC CASTS COLLECTION AND ASSESSMENT

Global impressions from both maxilla and mandible were performed, using alginate (Orthoprint®) and plaster of Paris as cast material. These are useful to measure some variables related to tooth (morphology, volume, long axis, incisal edge position) and gingival tissues (volume, symmetry, alveolar volume, and zenith levels), since they enable a direct and objective assessment because we can retrieve tri-dimensional additional information about the crowns and periimplant tissues. The following variables were measured to the nearest 0.1mm on diagnostic casts:

- *Clinical Crown width*: measured at three points (zenith, central point and incisal edge)
- *Buccal-lingual volume*: measured at three points equidistant 2 mm from each other, starting from the zenith;
- *Gingival zenith levels*: line connecting the most apical margins of the implant-supported crown and the adjacent tooth;

## 2.7 - AESTHETIC OUTCOME ASSESSMENT – OBJECTIVE INDEXES

The *PES/WES* (*Pink Esthetic Score/White Esthetic Score*) index, proposed by Belser and colleagues in 2009 as a modification of the *PES* index created by Furhauser and colleagues in 2005, measures both parameters concerning the peri-implant mucosa and the implant crown restoration. The *PES* evaluates five variables regarding the peri-implant soft tissues at the facial aspect of the implant site, such as mesial papilla, distal papilla, curvature of the facial mucosa, level of the facial mucosa and root convexity/soft tissue colour and texture. The *WES* specifically focuses on the visible part of the implant restoration itself and is based on the following five parameters: tooth form, volume, colour, surface characterization and translucency. With exception of papilla formation, the evaluation is performed by visually comparing the tooth at issue with its reference tooth (i.e., with the contralateral tooth in the incisor and canine zone and adjacent tooth in the premolar zone). For the mesial and distal papilla, the criteria of evaluation are complete, incomplete and absent. The remaining parameters are evaluated as having no discrepancy, minor discrepancy or a major discrepancy (Table. II). For each criterion, it is possible to award a score between two points (for a very good



outcome/no discrepancy) and no points (for a poor outcome/major discrepancy). The maximum score that can be achieved is 20 points, which indicates an outcome that reflects complete conformity between the soft tissue and the crown of the tooth being assessed and that of the reference tooth (21). A PES/WES score  $\geq 12$  is considered as the limit for an acceptable aesthetic outcome for an implant treatment. (16)

TABLE II - PES/WES INDEX

	0	1	2
PES			
MESIAL PAPILLA	Absent	Incomplete	Complete
DISTAL PAPILLA	Absent	Incomplete	Complete
CURVATURE OF THE FACIAL MUCOSA	Major discrepancy	Minor discrepancy	No discrepancy
LEVEL OF THE FACIAL MUCOSA	Major discrepancy	Minor discrepancy	No discrepancy
ROOT CONVEXITY/SOFT TISSUE COLOUR AND TEXTURE	Major discrepancy	Minor discrepancy	No discrepancy
WES			
CROWN FORM	Major discrepancy	Minor discrepancy	No discrepancy
CROWN VOLUME	Major discrepancy	Minor discrepancy	No discrepancy
CROWN COLOUR	Major discrepancy	Minor discrepancy	No discrepancy
SURFACE CHARACTERIZATION	Major discrepancy	Minor discrepancy	No discrepancy
TRANSLUCENCY	Major discrepancy	Minor discrepancy	No discrepancy

The *ICAI (Implant Crown Aesthetic Index) Index*, proposed by Meijer and colleagues in 2005 (8), consists of nine parameters, five of them being for the implant crown restoration and the other four for the peri-implant mucosa: mesiodistal dimension of the crown, position of the incisal edge of the crown, labial convexity of the crown, colour and translucency of the crown, texture of the crown, position of the vestibular margin of the peri-implant mucosa, position of the mucosa in the proximal spaces, contour of the vestibular structure of the mucosa and the colour and surface of the existing attached gingiva. This index is more complex, as there are some variables that can be given a five-point rating scale, such as the mesiodistal dimension of the crown, the position of the incisal edge of the crown, the labial convexity of the crown and the contour of the labial surface of the mucosa, while the others are judged on a three-point rating scale. Thereby, the five-point rating scale ranges from grossly undercontoured, slightly undercontoured, no deviation, slightly overcontoured to grossly overcontoured, whereas the three-point rating scale goes from gross mismatch, slight mismatch and no mismatch (Table III). Each item is given a score of 0 if there is no deviation/mismatch, a score of 1 if slight deviation/slightly overcontoured/slightly undercontoured or a score of 5 if gross deviation/grossly overcontoured/grossly undercontoured. Hence, the score range is from 0 to 45 and a single score of 5 or several minor deviations are sufficient to classify the restoration as unaesthetic.

**TABLE III - ICAI**

	5	1	0	1	5
MESIODISTAL DIMENSION OF THE CROWN	Grossly overcontoured	Slightly overcontoured	No deviation	Slightly undercontoured	Grossly undercontoured
POSITION OF THE INCISAL EDGE	Grossly overcontoured	Slightly overcontoured	No deviation	Slightly undercontoured	Grossly undercontoured
LABIAL CONVEXITY OF THE CROWN	Grossly overcontoured	Slightly overcontoured	No deviation	Slightly undercontoured	Grossly undercontoured
VESTIBULAR CONTOUR OF THE MUCOSA	Grossly overcontoured	Slightly overcontoured	No deviation	Slightly undercontoured	Grossly undercontoured
		5	1	0	
COLOUR AND TRANSLUCENCY OF THE CROWN		Major deviation	Minor deviation	No deviation	
TEXTURE OF THE CROWN		Major deviation	Minor deviation	No deviation	
POSITION OF THE VESTIBULAR MARGIN OF THE MUCOSA		Major deviation	Minor deviation	No deviation	
POSITION OF THE MUCOSA IN THE PROXIMAL SPACES		Major deviation	Minor deviation	No deviation	
COLOUR AND SURFACE OF THE MUCOSA		Major deviation	Minor deviation	No deviation	

Finally, the *C/S*, created at the Dental School in Copenhagen, is composed of: crown morphology score, crown colour match score, symmetry/harmony score; mucosal discoloration score, papilla index score mesially and distally. All these aesthetic parameters are categorized on a four-point rating scale, ranging from excellent, suboptimal, moderate to poor (Table IV). (15)

As for the crown morphology, it is assessed in relation to anatomy, surface textures, contours, prominences, contact points, crown length and crown width, in relation to the contralateral or adjacent tooth. Score of 1 means that the morphology was excellent; a score of 2 that it was satisfactory, but suboptimal in one or two parameters; a score of 3 that it was moderate and a score of 4 is for poor morphology concerning most of the subparameters.

The crown colour match score was assessed according to hue, value, chroma and translucency of the implant-supported crown compared to the contralateral or adjacent tooth. Score of 1 means that the colour was excellent and not easily distinguishable from the natural tooth; a score of 2 that it was satisfactory, but suboptimal in one or two parameters; a score of 3 that it was moderate and a score of 4 is for a poor colour match.

Symmetry/harmony was assessed according to the facial midline, the tooth axis, the contralateral tooth and the smile line. Score of 1 was excellent; a score of 2 was satisfactory, but suboptimal; a score of 3 was moderate and a score of 4 was for poor symmetry and harmony.

The mucosal discoloration score was 1, when no mucosal discoloration was visible. A score of 2 was given for light greyish mucosal discoloration, a score of 3 for a distinct greyish mucosal discoloration and a score of 4 was used when metal was visible.

For the evaluation of the mucosal papilla, the papilla index described by Jemt (1997) was used. Papilla Index 0, 1, 2 and 3 was directly converted to a score of 1 for the papilla filling the entire proximal space, a score of 2 for papilla filling at least half the proximal space, a score of 3 for less than half the proximal space filled by papilla and a score of 4 for no papilla.

The score range is from 6 to 24, where the lower the score, the better the aesthetic outcome.

**TABLE IV - CIS INDEX**

	1	2	3	4
CROWN MORPHOLOGY	Excellent	Suboptimal	Moderate	Poor
CROWN COLOUR MATCH	Excellent	Suboptimal	Moderate	Poor
SYMMETRY/HARMONY	Excellent	Suboptimal	Moderate	Poor
MUCOSAL DISCOLORATION	Excellent	Suboptimal	Moderate	Poor
MESIAL PAPILLA	Excellent	Suboptimal	Moderate	Poor
DISTAL PAPILLA	Excellent	Suboptimal	Moderate	Poor

## 2.8 - LIMITATIONS TO THE PROCEDURES

Dental technicians and Orthodontists' data was not included in this analysis, due to investigator, dental technicians and orthodontist's lack of time. The extra-oral photographs were not made available to the observers, so the correct analysis concerning symmetry in regard to facial middle line and lip line were not possible. The assessment of the diagnostic casts was also not executed. As this just constitutes a pilot study, the authors preferred to exclude their assessment for the present.

## 2.9 - STATISTICAL ANALYSIS

The statistical analysis was performed with a statistical software package (SPSS 21; IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp;).

The measure of agreement between clinical and photographic assessment (intra-investigator agreement) was calculated by Cohen's k, in order to investigate how closely the evaluation performed with these two different approaches was. Cohen's k was also used to determine the correlation between indexes. Landis and Koch (1977) proposed the following agreement graduation of k coefficients:

< 0	POOR
0 – 0.2	SLIGHT
0.21 – 0.4	FAIR
0.41 – 0.6	MODERATE
0.61 – 0.8	SUBSTANTIAL
0.81 – 1	ALMOST PERFECT

The internal consistency of the indexes was analysed by the Cronbach's  $\alpha$ . Between abutment materials comparisons were statistically explored with the Mann-Whitney U-test. SPSS Amos (Arbuckle, J. L. (2006). Amos (Version 7.0) [Computer Program]. Chicago: SPSS) was used to determine which of the aesthetic parameters most influences the outcome of a certain index.

### 3 - RESULTS

In the present pilot study, the investigator and 19 observers (3 prosthodontists, 3 periodontologists, 3 from other specializations and 10 undergraduate students) rated 16 cases regarding 25 parameters from the *PES/WES*, *ICA* and *CIS* indexes, for a total of 8400 assessments, given that the investigator assessed two times with two different methods.

61 patients were selected, but only 16 fulfilled the eligibility criteria and agreed to participate. The reasons for decline of participation were geographic factors, lack of time for the control, inability to make contact and death. Just one control visit was executed, due to patients' unavailability for a second one. The oral hygiene levels of some of these patients were not acceptable.

No case of peri-implantitis was observed. The study group was composed mostly by women (9 out of 16) between the ages of 38 to 58. The majority of implants were in the position of the central incisor (21, according to the FDI) and titanium was the predominant abutment material (56.25%).

All the information about the patients who participated in this study is presented below.

FIG. 2 – GENDER DISTRIBUTION

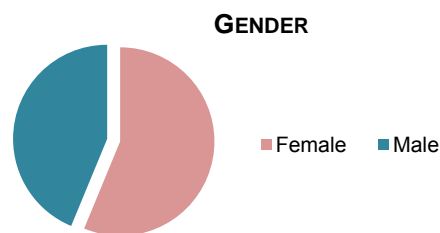


TABLE V - CHARACTERISTICS OF THE STUDY GROUP CONCERNING THE ABUTMENT MATERIAL

	14*	12*	11*	21*	22*	23*	24*
<b>Zirconia</b>	2 (28.6%) <sup>a</sup>	0 (0%) <sup>a</sup>	1 (14.3%) <sup>a</sup>	3 (42.9%) <sup>a</sup>	0 (0%) <sup>a</sup>	0 (0%) <sup>a</sup>	1 (14.3%) <sup>a</sup>
<b>Titanium</b>	2 (28.6%) <sup>b</sup>	3 (33.3%) <sup>b</sup>	0 (0%) <sup>b</sup>	2 (22.2%) <sup>b</sup>	1 (11%) <sup>b</sup>	1 (11%) <sup>b</sup>	0 (0%) <sup>b</sup>

<sup>a</sup> percentage within zirconia abutments

<sup>b</sup> percentage within titanium abutments

\*According to the FDI

FIG. 3 – LIP LINE DISTRIBUTION

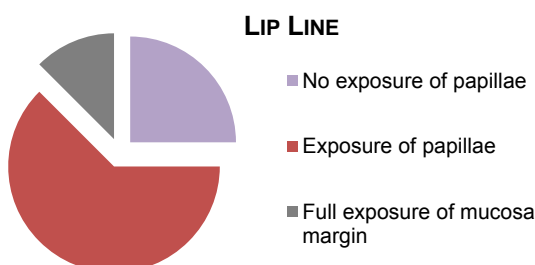
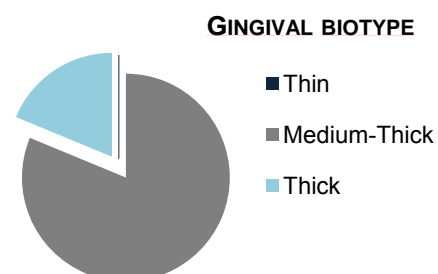
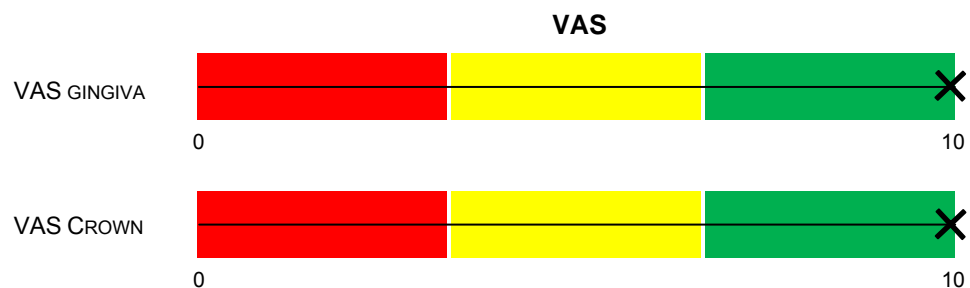


FIG. 4 – GINGIVAL BIOTYPE DISTRIBUTION



**TABLE VI - PATIENT #1**

PATIENT	A.A.M.
IMPLANT POSITION	14
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2008
LIP LINE	EXPOSURE OF PAPILLAE
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	4 MM
PES/WES (CLINICAL)	12
ICAI (CLINICAL)	20
CIS (CLINICAL)	9
PES/WES (PHOTOGRAPHS)	10
ICAI (PHOTOGRAPHS)	21
CIS (PHOTOGRAPHS)	12
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	10/10



**TABLE VII - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #1**

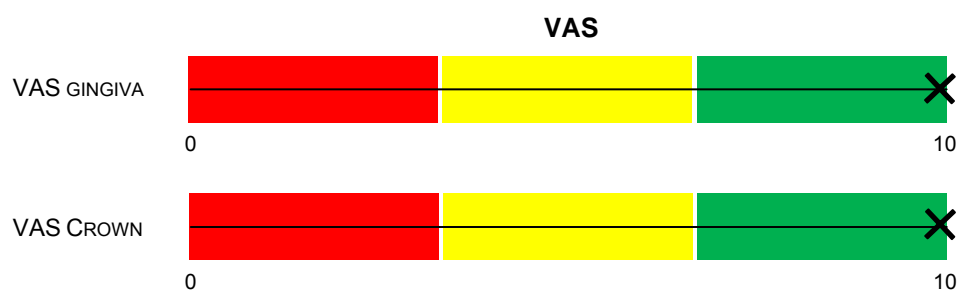
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	15 (±2.65)	19.67 (±14.37)	12.33 (±3.51)
PERIODONTOLOGISTS	12.33 (±5.69)	12.33 (±10.69)	10.67 (±1.52)
OTHERS	11.33 (±3.21)	24.33 (±3.51)	11.33 (±2.08)
STUDENTS	13.60 (±2.63)	24 (±13,69)	13.8 (±3.58)

**TABLE VIII - MOST FREQUENT ASSESSMENT RELATED TO EACH AESTHETIC PARAMETER, PATIENT #1**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	COMPLETE	94.7
DISTAL PAPILLA	INCOMPLETE	100
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	52.6
SOFT-TISSUE CONTOUR	NATURAL	57.9
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	52.6
CROWN SHAPE	NO DISCREPANCY	47.4
CROWN VOLUME	NO DISCREPANCY	52.6
CROWN COLOUR	MINOR DISCREPANCY	57.9
CROWN TEXTURE	MINOR DISCREPANCY	57.9
CROWN TRANSLUCENCY	MINOR DISCREPANCY	73.7
CROWN WIDTH MESIODISTALLY	NO MISMATCH	52.6
POSITION OF THE INCISAL EDGE	NO MISMATCH	52.6
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	63.2
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	63.2
TEXTURE OF THE CROWN	NO MISMATCH	63.2
HEIGHT OF THE GINGIVA	NO MISMATCH	47.4
INTERDENTAL PAPILLA	SLIGHT MISMATCH	68.4
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	68.4
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	52.6
CROWN MORPHOLOGY	SUBOPTIMAL	47.4
CROWN COLOUR MATCH	SUBOPTIMAL	52.6
SYMMETRY/HARMONY	SUBOPTIMAL	42.1
MUCOSAL DISCOLORATION	SUBOPTIMAL	47.4
MESIAL PAPILLA	EXCELLENT	52.6
DISTAL PAPILLA	SUBOPTIMAL/MODERATE	36.8

**TABLE IX - PATIENT #2**

PATIENT	A.C.B.
IMPLANT POSITION	14
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	2006
LIP LINE	FULL EXPOSURE OF MUCOSA MARGIN
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	2 MM
PES/WES (CLINICAL)	16
ICAI (CLINICAL)	3
CIS (CLINICAL)	7
PES/WES (PHOTOGRAPHS)	16
ICAI (PHOTOGRAPHS)	3
CIS (PHOTOGRAPHS)	7
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	10/10



**TABLE X - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #2**

	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	17 (± 1)	9.67 (± 0.57)	9.33 (± 2.08)
PERIODONTOLOGISTS	14.67 (± 4.93)	17.33 (± 14.43)	8.67 (± 0.57)
OTHERS	16 (± 1.73)	11 (± 9.85)	8.33 (± 1.53)
STUDENTS	13.40 (± 3.56)	10.9 (± 7.61)	12.20 (± 4.1)

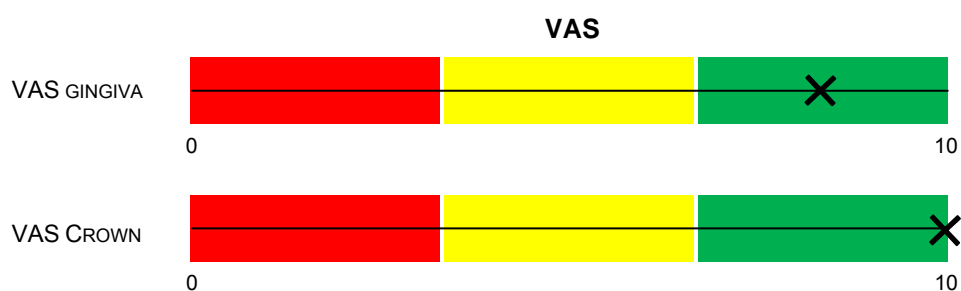


**TABLE XI - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #2**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	COMPLETE	78.9
DISTAL PAPILLA	INCOMPLETE	73.7
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	52.6
SOFT-TISSUE CONTOUR	NATURAL	47.4
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR AND NO DISCREPANCY	47.4
CROWN SHAPE	NO DISCREPANCY	63.2
CROWN VOLUME	NO DISCREPANCY	68.4
CROWN COLOUR	NO DISCREPANCY	57.9
CROWN TEXTURE	MINOR DISCREPANCY	47.4
CROWN TRANSLUCENCY	MINOR DISCREPANCY	47.4
CROWN WIDTH MESIODISTALLY	NO MISMATCH	84.2
POSITION OF THE INCISAL EDGE	NO MISMATCH	94.7
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	73.7
COLOUR AND TRANSLUCENCY OF THE CROWN	NO MISMATCH	52.6
TEXTURE OF THE CROWN	NO MISMATCH	52.6
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	57.9
INTERDENTAL PAPILLA	SLIGHT MISMATCH	94.7
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	52.6
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	63.2
CROWN MORPHOLOGY	EXCELLENT	52.6
CROWN COLOUR MATCH	EXCELLENT	52.6
SYMMETRY/HARMONY	EXCELLENT	68.4
MUCOSAL DISCOLORATION	EXCELLENT	47.4
MESIAL PAPILLA	EXCELLENT	52.6
DISTAL PAPILLA	SUBOPTIMAL	36.8

**TABLE XII - PATIENT #3**

PATIENT	A.F.
IMPLANT POSITION	14
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2009
LIP LINE	NO EXPOSURE OF PAPILLAE
GINGIVAL BIOTYPE	THICK
BOP (IMPLANT)	NO
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	16
ICAI (CLINICAL)	2
CIS (CLINICAL)	8
PES/WES (PHOTOGRAPHS)	16
ICAI (PHOTOGRAPHS)	21
CIS (PHOTOGRAPHS)	8
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	8.3/10



**TABLE XIII - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #3**

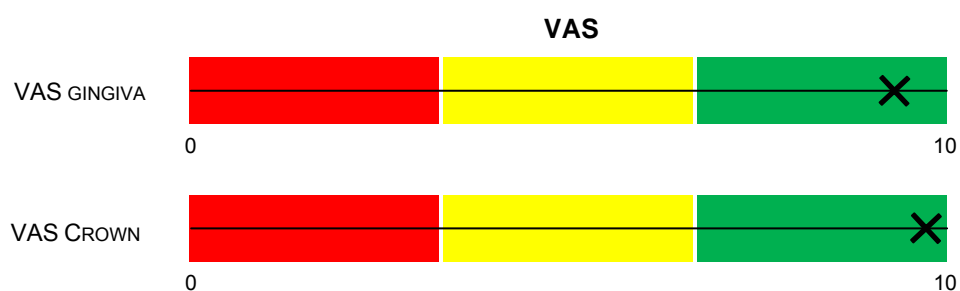
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	13.33 (± 2.08)	16.33 (± 6.11)	13.33 (± 4.04)
PERIODONTOLOGISTS	11.33 (± 3.51)	23 (± 3.46)	13.33 (± 3.21)
OTHERS	16.67 (± 2.52)	11 (± 10)	8.33 (± 0.58)
STUDENTS	13 (± 3.39)	17.4 (± 7.5)	13.9 (± 3.7)

**TABLE XIV - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #3**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	68.4
DISTAL PAPILLA	INCOMPLETE	68.4
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	47.4
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	57.9
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	66.7
CROWN SHAPE	MINOR DISCREPANCY	47.4
CROWN VOLUME	NO DISCREPANCY	68.4
CROWN COLOUR	NO DISCREPANCY	42.1
CROWN TEXTURE	MINOR AND NO DISCREPANCY	63.2
CROWN TRANSLUCENCY	MINOR DISCREPANCY	57.9
CROWN WIDTH MESIODISTALLY	NO MISMATCH	57.9
POSITION OF THE INCISAL EDGE	NO MISMATCH	84.2
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	73.7
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	68.4
TEXTURE OF THE CROWN	NO MISMATCH	63.2
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	68.4
INTERDENTAL PAPILLA	SLIGHT MISMATCH	68.4
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	78.9
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	63.2
CROWN MORPHOLOGY	EXCELLENT/SUBOPTIMAL	42.1
CROWN COLOUR MATCH	SUBOPTIMAL	42.1
SYMMETRY/HARMONY	EXCELLENT	47.4
MUCOSAL DISCOLORATION	SUBOPTIMAL	42.1
MESIAL PAPILLA	MODERATE	42.1
DISTAL PAPILLA	MODERATE	47.4

**TABLE XV - PATIENT #4**

PATIENT	C.M.
IMPLANT POSITION	12
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2008
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	4 MM
PES/WES (CLINICAL)	17
ICAI (CLINICAL)	1
CIS (CLINICAL)	7
PES/WES (PHOTOGRAPHS)	15
ICAI (PHOTOGRAPHS)	12
CIS (PHOTOGRAPHS)	8
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	9.3/9.7



**TABLE XVI - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #4**

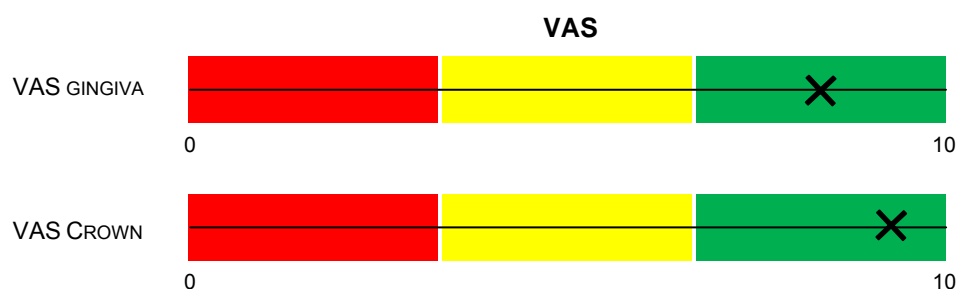
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	12.67 (± 4.16)	12 (± 5.29)	13.67 (± 4.04)
PERIODONTOLOGISTS	12.67 (± 2.31)	20.67 (± 14.23)	12.33 (± 2.52)
OTHERS	13.33 (± 2.52)	14 (± 5.29)	11.67 (± 4.04)
STUDENTS	12.10 (± 1.66)	16.9 (± 10.55)	13.5 (± 3.7)

**TABLE XVII - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #4**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	52.6
DISTAL PAPILLA	INCOMPLETE	73.7
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	57.9
SOFT-TISSUE CONTOUR	NATURAL	57.9
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	NO DISCREPANCY	68.4
CROWN SHAPE	MINOR DISCREPANCY	73.7
CROWN VOLUME	MINOR DISCREPANCY	52.6
CROWN COLOUR	MAJOR DISCREPANCY	47.4
CROWN TEXTURE	MINOR DISCREPANCY	47.4
CROWN TRANSLUCENCY	MINOR DISCREPANCY	42.1
CROWN WIDTH MESIODISTALLY	NO MISMATCH	63.2
POSITION OF THE INCISAL EDGE	NO MISMATCH/SLIGHTLY OVERCONTOURED	47.4
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	57.9
COLOUR AND TRANSLUCENCY OF THE CROWN	MAJOR MISMATCH	63.2
TEXTURE OF THE CROWN	SLIGHT MISMATCH	42.1
HEIGHT OF THE GINGIVA	NO MISMATCH	73.7
INTERDENTAL PAPILLA	SLIGHT MISMATCH	52.6
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	78.9
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO MISMATCH	78.9
CROWN MORPHOLOGY	SUBOPTIMAL	47.4
CROWN COLOUR MATCH	SUBOPTIMAL	42.1
SYMMETRY/HARMONY	SUBOPTIMAL	47.4
MUCOSAL DISCOLORATION	EXCELLENT	68.4
MESIAL PAPILLA	SUBOPTIMAL	52.6
DISTAL PAPILLA	SUBOPTIMAL	52.6

**TABLE XVIII - PATIENT #5**

PATIENT	I.M.P.
IMPLANT POSITION	23
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2005
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	10
ICAI (CLINICAL)	10
CIS (CLINICAL)	11
PES/WES (PHOTOGRAPHS)	9
ICAI (PHOTOGRAPHS)	24
CIS (PHOTOGRAPHS)	11
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	8.3/9.2



**TABLE XIX - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #5**

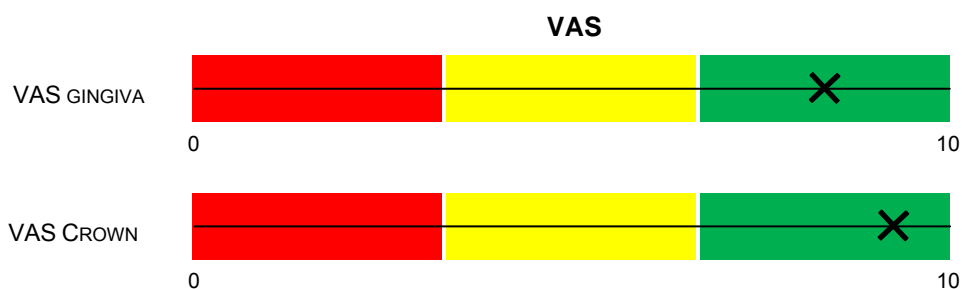
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	7,67 (± 3.51)	37.67 (± 12.22)	18 (± 1)
PERIODONTOLOGISTS	7.67 (± 3.79)	33.33 (± 3.05)	16 (± 3.46)
OTHERS	8.67 (± 1.53)	29 (± 12.29)	15 (± 4.36)
STUDENTS	7.7 (± 3.77)	31.9 (± 10.71)	17.4 (± 3.37)

**TABLE XX - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #5**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	ABSENT	52.6
DISTAL PAPILLA	INCOMPLETE	73.7
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	68.4
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	73.7
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	73.7
CROWN SHAPE	MINOR DISCREPANCY	52.6
CROWN VOLUME	MINOR DISCREPANCY	68.4
CROWN COLOUR	MINOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	52.6
CROWN TRANSLUCENCY	MINOR DISCREPANCY	42.1
CROWN WIDTH MESIODISTALLY	SLIGHTLY OVERCONTOURED	63.2
POSITION OF THE INCISAL EDGE	SLIGHTLY UNDERCONTOURED	57.9
LABIAL CONVEXITY OF THE CROWN	SLIGHTLY OVERCONTOURED	68.4
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	52.6
TEXTURE OF THE CROWN	SLIGHT MISMATCH	78.9
HEIGHT OF THE GINGIVA	SLIGHT/MAJOR MISMATCH	42.1
INTERDENTAL PAPILLA	MAJOR MISMATCH	57.9
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	57.9
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	57.9
CROWN MORPHOLOGY	MODERATE	57.9
CROWN COLOUR MATCH	MODERATE	47.4
SYMMETRY/HARMONY	MODERATE	63.2
MUCOSAL DISCOLORATION	MODERATE	42.1
MESIAL PAPILLA	MODERATE	47.4
DISTAL PAPILLA	POOR	52.6

**TABLE XXI - PATIENT #6**

PATIENT	M.C.G.
IMPLANT POSITION	11
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2011
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	YES
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	10
ICAI (CLINICAL)	16
CIS (CLINICAL)	11
PES/WES (PHOTOGRAPHS)	10
ICAI (PHOTOGRAPHS)	44
CIS (PHOTOGRAPHS)	13
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	8.3/9.2



**TABLE XXII** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #6

	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	8 (± 3.61)	28 (± 9.16)	18 (± 4.36)
PERIODONTOLOGISTS	6.33 (± 2.52)	38.33 (± 6.66)	19.67 (± 6.66)
OTHERS	7.33 (± 3.05)	41.33 (± 5.51)	17.67 (± 4.93)
STUDENTS	7.2 (± 2.10)	35.6 (± 11.16)	17.3 (± 2.05)

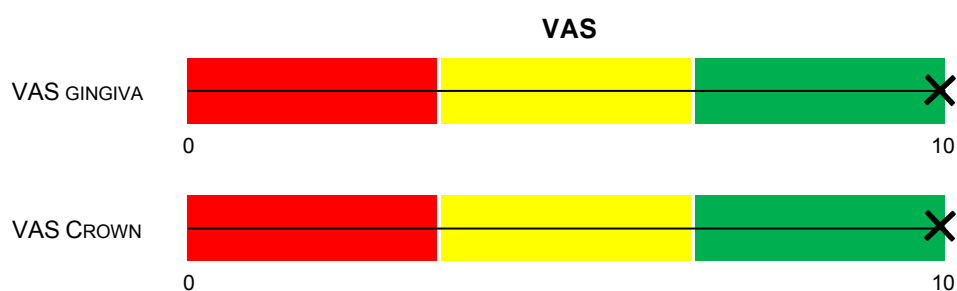


**TABLE XXV** MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #6

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	57.9
DISTAL PAPILLA	INCOMPLETE	68.4
LEVEL OF THE SOFT-TISSUE MARGIN	MAJOR/MINOR DISCREPANCY	47.4
SOFT-TISSUE CONTOUR	UNNATURAL	73.7
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MAJOR DISCREPANCY	94.7
CROWN SHAPE	MINOR DISCREPANCY	63.2
CROWN VOLUME	MINOR DISCREPANCY	57.9
CROWN COLOUR	MINOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	63.2
CROWN TRANSLUCENCY	MINOR DISCREPANCY	57.9
CROWN WIDTH MESIODISTALLY	SLIGHTLY OVERCONTOURED	47.4
POSITION OF THE INCISAL EDGE	NO MISMATCH	47.4
LABIAL CONVEXITY OF THE CROWN	SLIGHTLY OVERCONTOURED	68.4
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	52.6
TEXTURE OF THE CROWN	SLIGHT MISMATCH	84.2
HEIGHT OF THE GINGIVA	MAJOR MISMATCH	52.6
INTERDENTAL PAPILLA	SLIGHT MISMATCH	63.2
VESTIBULAR CONTOUR OF THE MUCOSA	GROSSLY UNDERCONTOURED	68.4
COLOUR AND SURFACE OF KERATINIZED GINGIVA	MAJOR MISMATCH	84.2
CROWN MORPHOLOGY	SUBOPTIMAL	47.4
CROWN COLOUR MATCH	POOR	42.1
SYMMETRY/HARMONY	SUBOPTIMAL	42.1
MUCOSAL DISCOLORATION	POOR	68.4
MESIAL PAPILLA	MODERATE	42.1
DISTAL PAPILLA	MODERATE	42.1

**TABLE XXVI - PATIENT #7**

PATIENT	M.H.T.
IMPLANT POSITION	12
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	2012
LIP LINE	NO EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	NO
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	10
ICAI (CLINICAL)	5
CIS (CLINICAL)	14
PES/WES (PHOTOGRAPHS)	10
ICAI (PHOTOGRAPHS)	26
CIS (PHOTOGRAPHS)	14
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	10/10



**TABLE XXVII** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #7

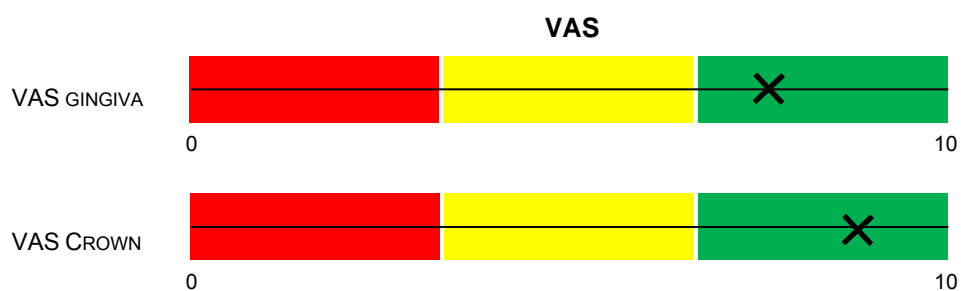
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	12.67 (± 5.36)	23 (± 15.87)	16 (± 4.58)
PERIODONTOLOGISTS	8.33 (± 4.04)	28.67 (± 8.39)	15 (± 4.36)
OTHERS	11.33 (± 1.53)	18.33 (± 13.28)	14 (± 0)
STUDENTS	8.1 (± 3.07)	17.3 (± 8.97)	15 (± 2.4)

**TABLE XVIII - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #7**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	ABSENT	57.9
DISTAL PAPILLA	ABSENT	52.6
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	57.9
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	68.4
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR/ NO DISCREPANCY	47.4
CROWN SHAPE	MINOR DISCREPANCY	57.9
CROWN VOLUME	MINOR DISCREPANCY	57.9
CROWN COLOUR	MINOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	42.1
CROWN TRANSLUCENCY	MINOR DISCREPANCY	42.1
CROWN WIDTH MESIODISTALLY	NO MISMATCH	78.9
POSITION OF THE INCISAL EDGE	NO MISMATCH	52.6
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	52.6
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	57.9
TEXTURE OF THE CROWN	SLIGHT MISMATCH	52.6
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	68.4
INTERDENTAL PAPILLA	SLIGHT MISMATCH	52.6
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	42.1
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO MISMATCH	57.9
CROWN MORPHOLOGY	SUBOPTIMAL/MODERATE	36.8
CROWN COLOUR MATCH	SUBOPTIMAL	57.9
SYMMETRY/HARMONY	MODERATE	47.4
MUCOSAL DISCOLORATION	EXCELLENT	42.1
MESIAL PAPILLA	POOR	42.1
DISTAL PAPILLA	POOR	52.6

**TABLE XXIX - PATIENT #8**

PATIENT	M.I.F.
IMPLANT POSITION	21
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	2008
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	2 MM
PES/WES (CLINICAL)	15
ICAI (CLINICAL)	8
CIS (CLINICAL)	10
PES/WES (PHOTOGRAPHS)	15
ICAI (PHOTOGRAPHS)	32
CIS (PHOTOGRAPHS)	12
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	7.6/8.8



**TABLE XXX** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #8

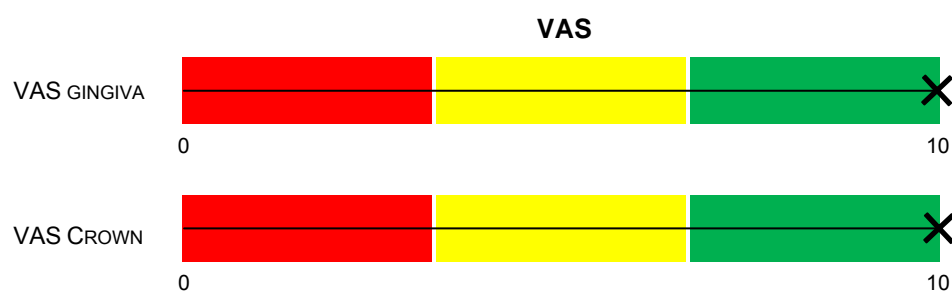
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	11.67 (± 4.16)	12.67 (± 9.5)	15 (± 3,61)
PERIODONTOLOGISTS	12.67 (± 2.31)	16.67 (± 1.16)	11.33 (± 2.52)
OTHERS	11 (± 3.46)	17 (± 14.11)	11.33(± 1.16)
STUDENTS	11.2 (± 3.68)	22.6 (± 8.19)	13.3 (± 2.79)

**TABLE XXXI - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #8**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	ABSENT	84.2
DISTAL PAPILLA	INCOMPLETE	63.2
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	73.7
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	47.4
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	NO DISCREPANCY	63.2
CROWN SHAPE	MINOR DISCREPANCY	78.9
CROWN VOLUME	MINOR DISCREPANCY	57.9
CROWN COLOUR	MINOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	78.9
CROWN TRANSLUCENCY	MINOR DISCREPANCY	57.9
CROWN WIDTH MESIODISTALLY	NO MISMATCH	47.4
POSITION OF THE INCISAL EDGE	NO MISMATCH	63.2
LABIAL CONVEXITY OF THE CROWN	SLIGHTLY OVERCONTOURED	68.4
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	68.4
TEXTURE OF THE CROWN	SLIGHT MISMATCH	84.2
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	57.9
INTERDENTAL PAPILLA	SLIGHT MISMATCH	73.7
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	42.1
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO MISMATCH	73.7
CROWN MORPHOLOGY	SUBOPTIMAL	78.9
CROWN COLOUR MATCH	SUBOPTIMAL	47.4
SYMMETRY/HARMONY	SUBOPTIMAL	68.4
MUCOSAL DISCOLORATION	EXCELLENT	78.9
MESIAL PAPILLA	SUBOPTIMAL	63.2
DISTAL PAPILLA	POOR	47.4

**TABLE XXXII - PATIENT #9**

PATIENT	M.L.B.
IMPLANT POSITION	24
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	2008
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	18
ICAI (CLINICAL)	0
CIS (CLINICAL)	9
PES/WES (PHOTOGRAPHS)	17
ICAI (PHOTOGRAPHS)	16
CIS (PHOTOGRAPHS)	9
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	10/10



**TABLE XXXIII** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #9

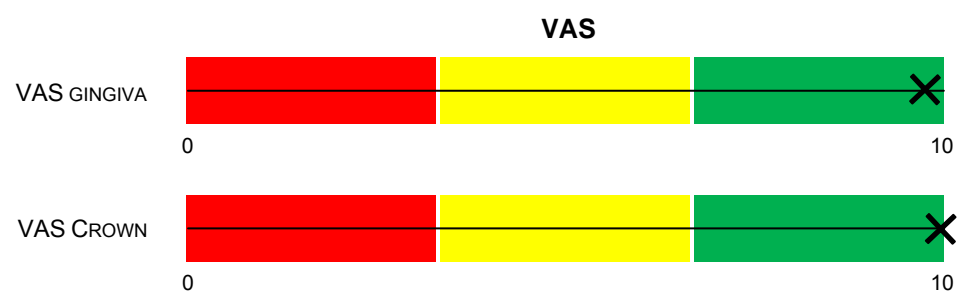
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
<b>PROSTHODONTISTS</b>	14.67 (± 2.08)	20.67 (± 6.43)	12.33 (± 2.31)
<b>PERIODONTOLOGISTS</b>	15.67 (± 0.58)	14.33 (± 5.69)	10 (± 1)
<b>OTHERS</b>	16.33 (± 1.53)	15.33 (± 0.58)	10(± 1)
<b>STUDENTS</b>	15.2 (± 4.32)	18.9 (± 11.11)	10.5 (± 3.59)

**TABLE XXXIV - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #9**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	COMPLETE	73.7
DISTAL PAPILLA	COMPLETE	47.4
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	73.7
SOFT-TISSUE CONTOUR	NATURAL	57.9
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	57.9
CROWN SHAPE	NO DISCREPANCY	52.6
CROWN VOLUME	NO DISCREPANCY	52.6
CROWN COLOUR	MINOR DISCREPANCY	63.2
CROWN TEXTURE	NO DISCREPANCY	78.9
CROWN TRANSLUCENCY	NO DISCREPANCY	63.2
CROWN WIDTH MESIODISTALLY	NO MISMATCH	78.9
POSITION OF THE INCISAL EDGE	SLIGHTLY UNDERCONTOURED	57.9
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	63.2
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	63.2
TEXTURE OF THE CROWN	NO MISMATCH	68.4
HEIGHT OF THE GINGIVA	NO MISMATCH	68.4
INTERDENTAL PAPILLA	NO MISMATCH	73.7
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	52.6
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	57.9
CROWN MORPHOLOGY	SUBOPTIMAL	63.2
CROWN COLOUR MATCH	SUBOPTIMAL	57.9
SYMMETRY/HARMONY	SUBOPTIMAL	78.9
MUCOSAL DISCOLORATION	EXCELLENT	42.1
MESIAL PAPILLA	EXCELLENT	63.2
DISTAL PAPILLA	SUBOPTIMAL	47.4

**TABLE XXXV - PATIENT #10**

PATIENT	M.N.A.
IMPLANT POSITION	22
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2010
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	YES
PD (IMPLANT)	4 MM
PES/WES (CLINICAL)	10
ICAI (CLINICAL)	8
CIS (CLINICAL)	10
PES/WES (PHOTOGRAPHS)	6
ICAI (PHOTOGRAPHS)	34
CIS (PHOTOGRAPHS)	11
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	9.7/10



**TABLE XXXVI - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #10**

	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	6.67 (± 6.11)	24.67 (± 18.14)	18.67 (± 5.13)
PERIODONTOLOGISTS	6.67 (± 1.53)	28 (± 8.88)	16.67 (± 4.04)
OTHERS	6 (± 3.61)	32.67 (± 8.08)	15.67 (± 3.22)
STUDENTS	13 (± 4.08)	24.25 (± 14.18)	13.5 (± 4.04)

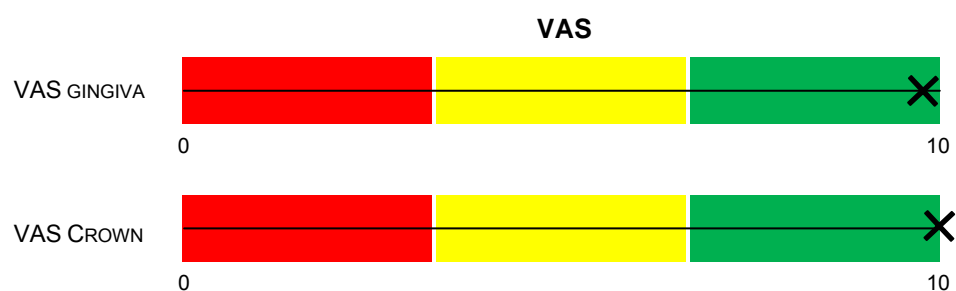


**TABLE XXXVII - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #10**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	ABSENT	78.9
DISTAL PAPILLA	ABSENT	78.9
LEVEL OF THE SOFT-TISSUE MARGIN	MAJOR/NO DISCREPANCY	42.1
SOFT-TISSUE CONTOUR	NATURAL	42.1
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	47.4
CROWN SHAPE	MINOR DISCREPANCY	57.9
CROWN VOLUME	MINOR DISCREPANCY	52.6
CROWN COLOUR	MAJOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	63.2
CROWN TRANSLUCENCY	MINOR DISCREPANCY	52.6
CROWN WIDTH MESIODISTALLY	SLIGHTLY OVERCONTOURED	47.4
POSITION OF THE INCISAL EDGE	NO MISMATCH	47.4
LABIAL CONVEXITY OF THE CROWN	SLIGHTLY OVERCONTOURED	52.6
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	68.4
TEXTURE OF THE CROWN	SLIGHT MISMATCH	73.7
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	47.4
INTERDENTAL PAPILLA	SLIGHT/GROSS MISMATCH	42.1
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	68.4
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	68.4
CROWN MORPHOLOGY	MODERATE	36.8
CROWN COLOUR MATCH	SUBOPTIMAL	52.6
SYMMETRY/HARMONY	MODERATE	47.4
MUCOSAL DISCOLORATION	MODERATE	47.4
MESIAL PAPILLA	POOR	52.6
DISTAL PAPILLA	POOR	47.4

**TABLE XXXIX - PATIENT #11**

PATIENT	P.C.P.
IMPLANT POSITION	12
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2008
LIP LINE	NO EXPOSURE OF PAPILLAE
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	17
ICAI (CLINICAL)	1
CIS (CLINICAL)	7
PES/WES (PHOTOGRAPHS)	18
ICAI (PHOTOGRAPHS)	11
CIS (PHOTOGRAPHS)	8
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	9.8/10



**TABLE XL- COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #11**

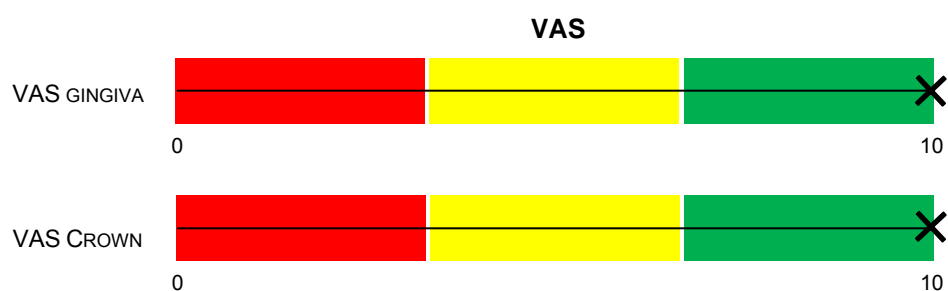
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	13 (± 4.08)	24.25 (± 14.18)	13.5 (± 4.04)
PERIODONTOLOGISTS	14 (± 1.41)	21 (± 16.97)	11 (± 2.83)
OTHERS	17.67 (± 0.58)	7.67 (± 4.93)	8.33 (± 1.15)
STUDENTS	14.5(± 2.22)	15 (± 9.17)	12.1 (± 2.47)

**TABLE XLI - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #11**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	73.7
DISTAL PAPILLA	COMPLETE	78.9
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	63.2
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	68.4
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	NO DISCREPANCY	52.6
CROWN SHAPE	MINOR DISCREPANCY	47.4
CROWN VOLUME	NO/MINOR DISCREPANCY	47.4
CROWN COLOUR	NO DISCREPANCY	57.9
CROWN TEXTURE	NO DISCREPANCY	68.4
CROWN TRANSLUCENCY	NO DISCREPANCY	73.7
CROWN WIDTH MESIODISTALLY	NO MISMATCH	68.4
POSITION OF THE INCISAL EDGE	NO MISMATCH/SLIGHTLY UNDERCONTOURED	47.4
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	57.9
COLOUR AND TRANSLUCENCY OF THE CROWN	NO MISMATCH	57.9
TEXTURE OF THE CROWN	NO MISMATCH	57.9
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	63.2
INTERDENTAL PAPILLA	SLIGHT MISMATCH	78.9
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	68.4
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO/SLIGHT MISMATCH	42.1
CROWN MORPHOLOGY	SUBOPTIMAL	73.7
CROWN COLOUR MATCH	EXCELLENT	63.2
SYMMETRY/HARMONY	EXCELLENT	42.1
MUCOSAL DISCOLORATION	MODERATE	47.4
MESIAL PAPILLA	SUBOPTIMAL/POOR	42.1
DISTAL PAPILLA	EXCELLENT	47.4

**TABLE XLII - PATIENT #12**

PATIENT	R.A.V.
IMPLANT POSITION	21
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	-
LIP LINE	FULL EXPOSURE OF MUCOSA MARGIN
GINGIVAL BIOTYPE	THICK
BOP (IMPLANT)	YES
PD (IMPLANT)	8 MM
PES/WES (CLINICAL)	17
ICAI (CLINICAL)	5
CIS (CLINICAL)	6
PES/WES (PHOTOGRAPHS)	15
ICAI (PHOTOGRAPHS)	13
CIS (PHOTOGRAPHS)	6
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	10/10



**TABLE XLIII** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #12

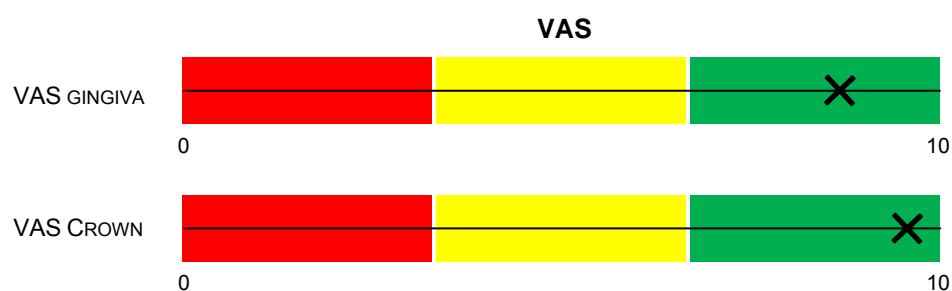
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
<b>PROSTHODONTISTS</b>	10.33(± 4.04)	20.33 (± 5.86)	14 (± 4)
<b>PERIODONTOLOGISTS</b>	13.33 (± 4.73)	20.33 (± 4.73)	10.67 (± 1.16)
<b>OTHERS</b>	11.33 (± 11.01)	18.33 (± 11.01)	10.33 (± 4.51)
<b>STUDENTS</b>	10.4 (± 4.01)	21.2 (± 11.46)	14.4 (± 2.22)

**TABLE XLIV** MOST FREQUENT ASSESSMENT, REGARDING EACH AESTHETIC PARAMETER, PATIENT #12

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	ABSENT	63.2
DISTAL PAPILLA	ABSENT	68.4
LEVEL OF THE SOFT-TISSUE MARGIN	MINOR DISCREPANCY	63.2
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	53.6
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	63.2
CROWN SHAPE	MINOR DISCREPANCY	57.9
CROWN VOLUME	MINOR DISCREPANCY	63.2
CROWN COLOUR	MINOR DISCREPANCY	78.9
CROWN TEXTURE	MINOR DISCREPANCY	52.6
CROWN TRANSLUCENCY	MINOR DISCREPANCY	57.9
CROWN WIDTH MESIODISTALLY	NO MISMATCH	63.2
POSITION OF THE INCISAL EDGE	SLIGHTLY UNDERCONTOURED	63.2
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	42.1
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	63.2
TEXTURE OF THE CROWN	SLIGHT MISMATCH	52.6
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	68.4
INTERDENTAL PAPILLA	SLIGHT MISMATCH	42.1
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	36.8
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	63.2
CROWN MORPHOLOGY	SUBOPTIMAL	63.2
CROWN COLOUR MATCH	SUBOPTIMAL	68.4
SYMMETRY/HARMONY	SUBOPTIMAL	52.6
MUCOSAL DISCOLORATION	SUBOPTIMAL	52.6
MESIAL PAPILLA	SUBOPTIMAL	36.6
DISTAL PAPILLA	POOR	31.6

**TABLE XLV - PATIENT #13**

PATIENT	R.J.M.
IMPLANT POSITION	21
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2011
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	2 MM
PES/WES (CLINICAL)	17
ICAI (CLINICAL)	8
CIS (CLINICAL)	10
PES/WES (PHOTOGRAPHS)	17
ICAI (PHOTOGRAPHS)	31
CIS (PHOTOGRAPHS)	11
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	8.8/9.7



**TABLE XLVI** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #13

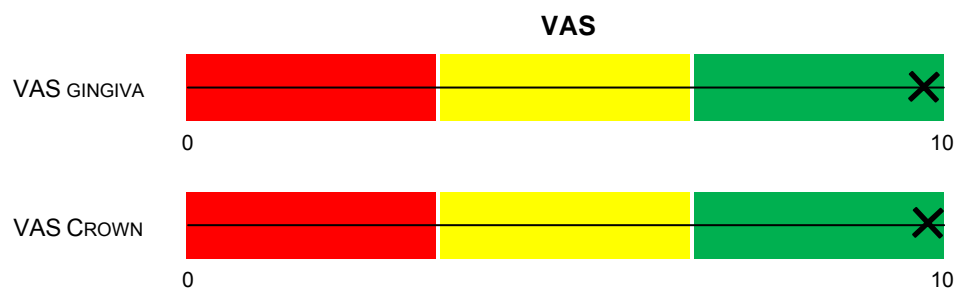
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
<b>PROSTHODONTISTS</b>	13.33 (± 2.89)	21.33 (± 12.01)	15 (± 2.67)
<b>PERIODONTOLOGISTS</b>	12.33 (± 3.79)	24.67 (± 8.73)	12.33 (± 1.53)
<b>OTHERS</b>	14.33 (± 3.79)	21 (± 9.17)	12 (± 2.67)
<b>STUDENTS</b>	13.9 (± 2.51)	21.8 (± 7.58)	12.3 (± 2.79)

**TABLE XLVII -MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #13**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	COMPLETE	89.5
DISTAL PAPILLA	COMPLETE	63.2
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	63.2
SOFT-TISSUE CONTOUR	FAIRLY NATURAL	52.6
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	57.9
CROWN SHAPE	MINOR DISCREPANCY	57.9
CROWN VOLUME	NO DISCREPANCY	63.2
CROWN COLOUR	MINOR DISCREPANCY	68.4
CROWN TEXTURE	NO DISCREPANCY	68.4
CROWN TRANSLUCENCY	MINOR DISCREPANCY	63.2
CROWN WIDTH MESIODISTALLY	NO MISMATCH	52.6
POSITION OF THE INCISAL EDGE	SLIGHTLY UNDERCONTOURED	63.2
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	73.7
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	73.7
TEXTURE OF THE CROWN	NO MISMATCH	68.4
HEIGHT OF THE GINGIVA	SLIGHT MISMATCH	52.6
INTERDENTAL PAPILLA	SLIGHT MISMATCH	57.9
VESTIBULAR CONTOUR OF THE MUCOSA	SLIGHTLY UNDERCONTOURED	57.9
COLOUR AND SURFACE OF KERATINIZED GINGIVA	MAJOR MISMATCH	68.4
CROWN MORPHOLOGY	SUBOPTIMAL	52.6
CROWN COLOUR MATCH	SUBOPTIMAL	47.4
SYMMETRY/HARMONY	SUBOPTIMAL	57.9
MUCOSAL DISCOLORATION	MODERATE/POOR	42.1
MESIAL PAPILLA	EXCELLENT	42.1
DISTAL PAPILLA	EXCELLENT	52.6

**TABLE XLVIII - PATIENT #14**

PATIENT	R.J.P.
IMPLANT POSITION	14
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	2010
LIP LINE	NO EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	THICK
BOP (IMPLANT)	NO
PD (IMPLANT)	3 MM
PES/WES (CLINICAL)	18
ICAI (CLINICAL)	5
CIS (CLINICAL)	7
PES/WES (PHOTOGRAPHS)	19
ICAI (PHOTOGRAPHS)	7
CIS (PHOTOGRAPHS)	7
WOULD YOU RECOMMEND THE TREATMENT?	YES
WOULD YOU REPEAT THE TREATMENT?	YES
VAS (GINGIVA/CROWN)	8.3/10



**TABLE XLIX - COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #14**

	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	16.67 (± 2.08)	4.67 (± 4.73)	9 (± 1)
PERIODONTOLOGISTS	18 (± 1.73)	5.67 (± 4.93)	7.67 (± 2.08)
OTHERS	18 (± 1)	5.67 (± 8.15)	7 (± 1)
STUDENTS	16.6 (± 2.84)	7 (± 9.79)	8.5 (± 1.9)

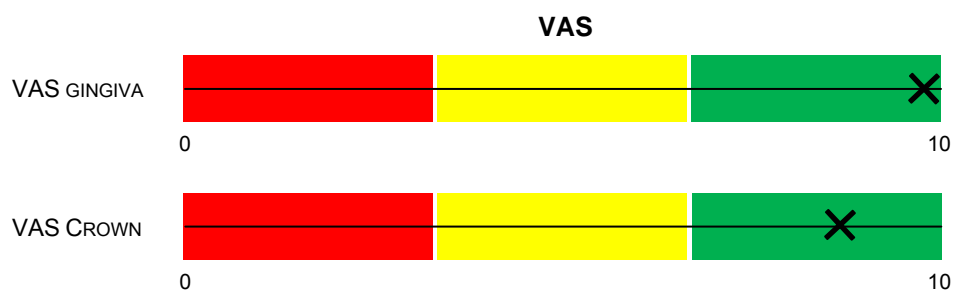


**TABLE L.** MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #14

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	COMPLETE	84.2
DISTAL PAPILLA	COMPLETE	73.7
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	84.2
SOFT-TISSUE CONTOUR	NATURAL	94.7
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	NO DISCREPANCY	63.2
CROWN SHAPE	NO DISCREPANCY	89.5
CROWN VOLUME	NO DISCREPANCY	73.7
CROWN COLOUR	MINOR DISCREPANCY	63.2
CROWN TEXTURE	NO DISCREPANCY	52.6
CROWN TRANSLUCENCY	MINOR DISCREPANCY	52.6
CROWN WIDTH MESIODISTALLY	NO MISMATCH	84.2
POSITION OF THE INCISAL EDGE	NO MISMATCH	89.5
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	84.2
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	57.9
TEXTURE OF THE CROWN	SLIGHT MISMATCH	52.6
HEIGHT OF THE GINGIVA	NO MISMATCH	78.9
INTERDENTAL PAPILLA	NO MISMATCH	68.4
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	78.9
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO MISMATCH	73.7
CROWN MORPHOLOGY	EXCELLENT	68.4
CROWN COLOUR MATCH	SUBOPTIMAL	52.6
SYMMETRY/HARMONY	EXCELLENT	63.2
MUCOSAL DISCOLORATION	EXCELLENT	63.2
MESIAL PAPILLA	EXCELLENT	84.2
DISTAL PAPILLA	EXCELLENT	63.2

**TABLE LI. PATIENT #15**

PATIENT	R.M.L.
IMPLANT POSITION	21
ABUTMENT	TITANIUM
CROWN	METALOCERAMIC
RETENTION	CEMENTED
YEAR OF REHABILITATION	2012
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	2 MM
PES/WES (CLINICAL)	15
ICAI (CLINICAL)	3
CIS (CLINICAL)	10
PES/WES (PHOTOGRAPHS)	15
ICAI (PHOTOGRAPHS)	14
CIS (PHOTOGRAPHS)	10
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	10/8.8



**TABLE LII** COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #15

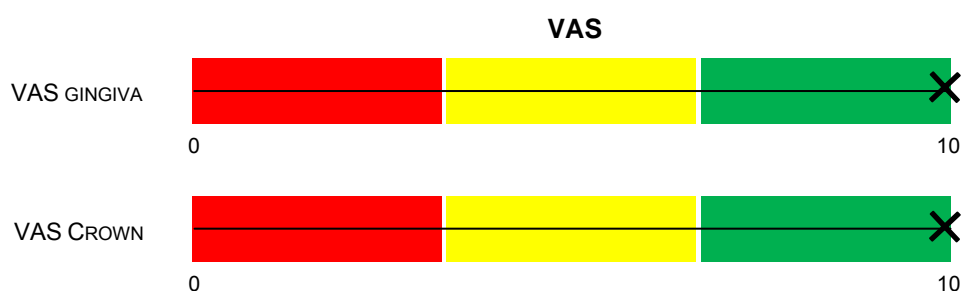
	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
<b>PROSTHODONTISTS</b>	10 (± 5.19)	22.67 (± 21.13)	15 (± 6.08)
<b>PERIODONTOLOGISTS</b>	13.33 (± 6.35)	11.33 (± 12.1)	11 (± 4.36)
<b>OTHERS</b>	11 (± 4)	16.67 (± 2.52)	12.33 (± 3.06)
<b>STUDENTS</b>	12.5 (± 1.9)	19.10 (± 9.94)	13.7 (± 2.71)

**TABLE LIII - MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #15**

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	57.9
DISTAL PAPILLA	INCOMPLETE	52.6
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	63.2
SOFT-TISSUE CONTOUR	NATURAL	47.4
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	MINOR DISCREPANCY	66.7
CROWN SHAPE	NO DISCREPANCY	52.5
CROWN VOLUME	NO DISCREPANCY	63.2
CROWN COLOUR	MINOR DISCREPANCY	52.6
CROWN TEXTURE	MINOR DISCREPANCY	52.6
CROWN TRANSLUCENCY	MINOR DISCREPANCY	73.7
CROWN WIDTH MESIODISTALLY	NO MISMATCH	47.4
POSITION OF THE INCISAL EDGE	NO MISMATCH	63.2
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	68.4
COLOUR AND TRANSLUCENCY OF THE CROWN	SLIGHT MISMATCH	84.2
TEXTURE OF THE CROWN	SLIGHT MISMATCH	52.6
HEIGHT OF THE GINGIVA	NO MISMATCH	52.6
INTERDENTAL PAPILLA	SLIGHT MISMATCH	52.6
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	63.2
COLOUR AND SURFACE OF KERATINIZED GINGIVA	SLIGHT MISMATCH	42.1
CROWN MORPHOLOGY	SUBOPTIMAL	52.6
CROWN COLOUR MATCH	SUBOPTIMAL	52.6
SYMMETRY/HARMONY	SUBOPTIMAL	42.1
MUCOSAL DISCOLORATION	EXCELLENT	36.8
MESIAL PAPILLA	MODERATE	47.4
DISTAL PAPILLA	SUBOPTIMAL	52.6

**TABLE LIV - PATIENT #16**

PATIENT	S.B.
IMPLANT POSITION	21
ABUTMENT	ZIRCONIA
CROWN	CERAMIC
RETENTION	SCREWED
YEAR OF REHABILITATION	-
LIP LINE	EXPOSURE OF PAPILLA
GINGIVAL BIOTYPE	MEDIUM-THICK
BOP (IMPLANT)	No
PD (IMPLANT)	1 MM
PES/WES (CLINICAL)	19
ICAI (CLINICAL)	1
CIS (CLINICAL)	7
PES/WES (PHOTOGRAPHS)	18
ICAI (PHOTOGRAPHS)	8
CIS (PHOTOGRAPHS)	8
WOULD YOU RECOMMEND THE TREATMENT?	Yes
WOULD YOU REPEAT THE TREATMENT?	Yes
VAS (GINGIVA/CROWN)	10/10



**TABLE LV. COMPARISON OF THE DIFFERENT OBJECTIVE INDEXES BETWEEN SPECIALIZATION GROUPS, PATIENT #16**

	PES/WES (MEAN SCORE)	ICAI (MEAN SCORE)	CIS (MEAN SCORE)
PROSTHODONTISTS	16 (± 3.61)	7.67 (± 2.31)	9.67 (± 1.16)
PERIODONTOLOGISTS	17.33 (± 2.52)	6.33 (± 4.62)	7.33 (± 1.53)
OTHERS	17.33 (± 0.58)	6.33 (± 3.79)	10.33 (± 1.53)
STUDENTS	17.3 (± 2.71)	5.70 (± 8.97)	10.4 (± 2.99)

**TABLE LVI.** MOST FREQUENT ASSESSMENT REGARDING EACH AESTHETIC PARAMETER, PATIENT #16

AESTHETIC PARAMETER	OUTCOME	%
MESIAL PAPILLA	INCOMPLETE	73.7
DISTAL PAPILLA	COMPLETE	52.6
LEVEL OF THE SOFT-TISSUE MARGIN	NO DISCREPANCY	78.9
SOFT-TISSUE CONTOUR	NATURAL	78.9
ALVEOLAR PROCESS/SOFT TISSUE COLOUR AND TEXTURE	NO DISCREPANCY	57.9
CROWN SHAPE	NO DISCREPANCY	89.5
CROWN VOLUME	NO DISCREPANCY	89.5
CROWN COLOUR	NO DISCREPANCY	89.5
CROWN TEXTURE	NO DISCREPANCY	89.5
CROWN TRANSLUCENCY	NO DISCREPANCY	78.9
CROWN WIDTH MESIODISTALLY	NO MISMATCH	89.5
POSITION OF THE INCISAL EDGE	NO MISMATCH	94.7
LABIAL CONVEXITY OF THE CROWN	NO MISMATCH	78.9
COLOUR AND TRANSLUCENCY OF THE CROWN	NO MISMATCH	84.2
TEXTURE OF THE CROWN	NO MISMATCH	89.5
HEIGHT OF THE GINGIVA	NO MISMATCH	68.4
INTERDENTAL PAPILLA	SLIGHT MISMATCH	47.4
VESTIBULAR CONTOUR OF THE MUCOSA	NO MISMATCH	68.4
COLOUR AND SURFACE OF KERATINIZED GINGIVA	NO MISMATCH	52.6
CROWN MORPHOLOGY	EXCELLENT	89.5
CROWN COLOUR MATCH	EXCELLENT	84.2
SYMMETRY/HARMONY	EXCELLENT	89.5
MUCOSAL DISCOLORATION	EXCELLENT/SUBOPTIMAL	47.4
MESIAL PAPILLA	MODERATE	47.4
DISTAL PAPILLA	SUBOPTIMAL	47.4

The most aesthetic outcome was regarding patient #14, whereas the least aesthetic case was that concerning patient #6.

### 3.1 - AGREEMENT BETWEEN CLINICAL AND PHOTOGRAPHIC RATINGS

There is considerable inter-observer agreement between the two evaluations, clinical and photographic, performed by the investigator involved in the study (Table LVII), as the majority of the parameters have moderate or higher correlation concerning the outcome of the different indexes (Cohen's  $k > 0.41$ ). Crown texture and translucency evaluated by means of the *PES/WES* index and perception of symmetry/harmony evaluated with the *C/S* index had the best-observed agreement (100%), whereas distal papilla evaluated with *PES/WES* index had the worst agreement (19%).

**TABLE LVII.** AGREEMENT BETWEEN CLINICAL AND PHOTOGRAPHIC ASSESSMENT (COHEN'S K)

PARAMETER	K	MEANING
MESIAL PAPILLA	0.81	ALMOST PERFECT
DISTAL PAPILLA	0.19	POOR
LEVEL OF THE SOFT-TISSUE MARGIN	0.77	SUBSTANTIAL
SOFT-TISSUE CONTOUR	0.54	MODERATE
ALVEOLAR PROCESS/ SOFT-TISSUE COLOUR AND TEXTURE	0.77	SUBSTANTIAL
CROWN SHAPE	0.88	ALMOST PERFECT
CROWN VOLUME	0.88	ALMOST PERFECT
CROWN COLOUR	0.75	SUBSTANTIAL
CROWN TEXTURE	1	PERFECT
CROWN TRANSLUCENCY	1	PERFECT
CROWN WIDTH MESIODISTALLY	0.64	SUBSTANTIAL
POSITION OF THE INCISAL EDGE	0.56	MODERATE
LABIAL CONVEXITY OF THE CROWN	0.85	ALMOST PERFECT
COLOUR AND TRANSLUCENCY OF THE CROWN	0.65	SUBSTANTIAL
TEXTURE OF THE CROWN	0.54	MODERATE
HEIGHT OF THE GINGIVA	0.62	SUBSTANTIAL
INTERDENTAL PAPILLA	0.67	SUBSTANTIAL
VESTIBULAR CONTOUR OF THE MUCOSA	0.78	SUBSTANTIAL
COLOUR AND SURFACE OF KERATINIZED GINGIVA	0.56	MODERATE
CROWN MORPHOLOGY	0.67	SUBSTANTIAL
CROWN COLOUR MATCH	0.73	SUBSTANTIAL
SYMMETRY/HARMONY	1	PERFECT
MUCOSAL DISCOLORATION	0.72	SUBSTANTIAL
DISTAL PAPILLA	0.69	SUBSTANTIAL
MESIAL PAPILLA	0.9	ALMOST PERFECT

<0.2: POOR
0-0.2: SLIGHT
0.21 – 0.4: FAIR
0.41 – 0.6: MODERATE
0.61 – 0.8: SUBSTANTIAL
0.81 – 1: ALMOST PERFECT

The weighted Cohen's k demonstrated that 52% (thirteen out of 25 measurements) of intra-observer agreement were substantial, 28% (seven out of 25 measurements) almost perfect, 16% (four out of 25 measurements) were moderate and 4% poor.

### 3.2 - CLINICAL VS. PHOTOGRAPHIC EVALUATIONS

The authors wanted to know whether or not there was a relationship between the evaluations performed by the investigator during the control visit and the mean scores of the observers, who had their evaluation based on photographs. The following table compares the answers given, in the form of the difference between the indexes. The percentage values are similar, as there is no statistically significant difference between either method ( $p < 0.05$ ).

TABLE LVIII. COMPARISON BETWEEN CLINICAL EVALUATION AND PHOTOGRAPHIC ASSESSMENT

		N	% (PHOTOGRAPHIC)	N	% (CLINICAL)
<b>ICAI - CIS</b>	NEGATIVE	75	23.4%	5	31%
	POSITIVE	216	67.5%	11	69%
	TIES	29	9%	0	
	TOTAL	320		16	
<b>PES/WES - CIS</b>	NEGATIVE	32	10%	3	19%
	POSITIVE	268	84%	13	81%
	TIES	20	6%	0	
	TOTAL	320		16	
<b>PES/WES - ICAI</b>	NEGATIVE	112	35%	3	19%
	POSITIVE	156	49%	8	50%
	TIES	52	16%	5	31%
	TOTAL	320		16	

N – number of assessments

### 3.3 - COMPARISON BETWEEN INDEXES

The comparison between the frequency of aesthetic and unaesthetic outcomes from the different indexes was performed and, even though there is an accordance between them, ( $p < 0.05$ ), the correlation is poor (*PES/WES* vs. *ICAI* and *ICAI* vs. *CIS*) and moderate (*PES/WES* vs. *CIS*). As shown in Table LIX, *PES/WES* and *ICAI* agree that 121 of the restorations evaluated have a poor aesthetic outcome, but in 152 cases, they disagree, as the *PES/WES* considers that they are aesthetic, whereas *ICAI* considers otherwise. The same happens between *ICAI* and *CIS*, as in 126 cases they agree on a poor aesthetic, but in 147, there is a disagreement (Table LX). When *PES/WES* and *CIS* are compared, the agreement is moderate, as there are more cases in which they agree than those where they disagree (Table LXI). Furthermore, the internal consistency of each index was calculated, as the *PES/WES* index has the higher value (Cronbach's  $\alpha = 0.85$ ), followed by the *CIS* index (Cronbach's  $\alpha = 0.81$ ) and finally de *ICAI* index (Cronbach's  $\alpha = 0.7$ ).

**TABLE LIX. COMPARISON BETWEEN THE AESTHETIC OUTCOME: PES/WES vs. ICAI**

		ICAI		Total
		Poor aesthetic	Aesthetic	
PES/WES	Poor aesthetic	121	1	122
	Aesthetic	152	30	182
Total		273	31	304

$p=0$  ( $<0.05$ )

$K=0.13$  (poor)

**TABLE LX COMPARISON BETWEEN THE AESTHETIC OUTCOME: PES/WES vs. CIS**

		CIS		Total
		Poor aesthetic	Aesthetic	
PES/WES	Poor aesthetic	95	27	122
	Aesthetic	32	150	182
Total		127	177	304

$p=0$  ( $<0.05$ )

$K=0.6$  (moderate)

**TABLE LXI. COMPARISON BETWEEN THE AESTHETIC OUTCOME: ICAI vs. CIS**

		CIS		Total
		Poor aesthetic	Aesthetic	
ICAI	Poor aesthetic	126	147	273
	Aesthetic	1	30	31
Total		127	177	304

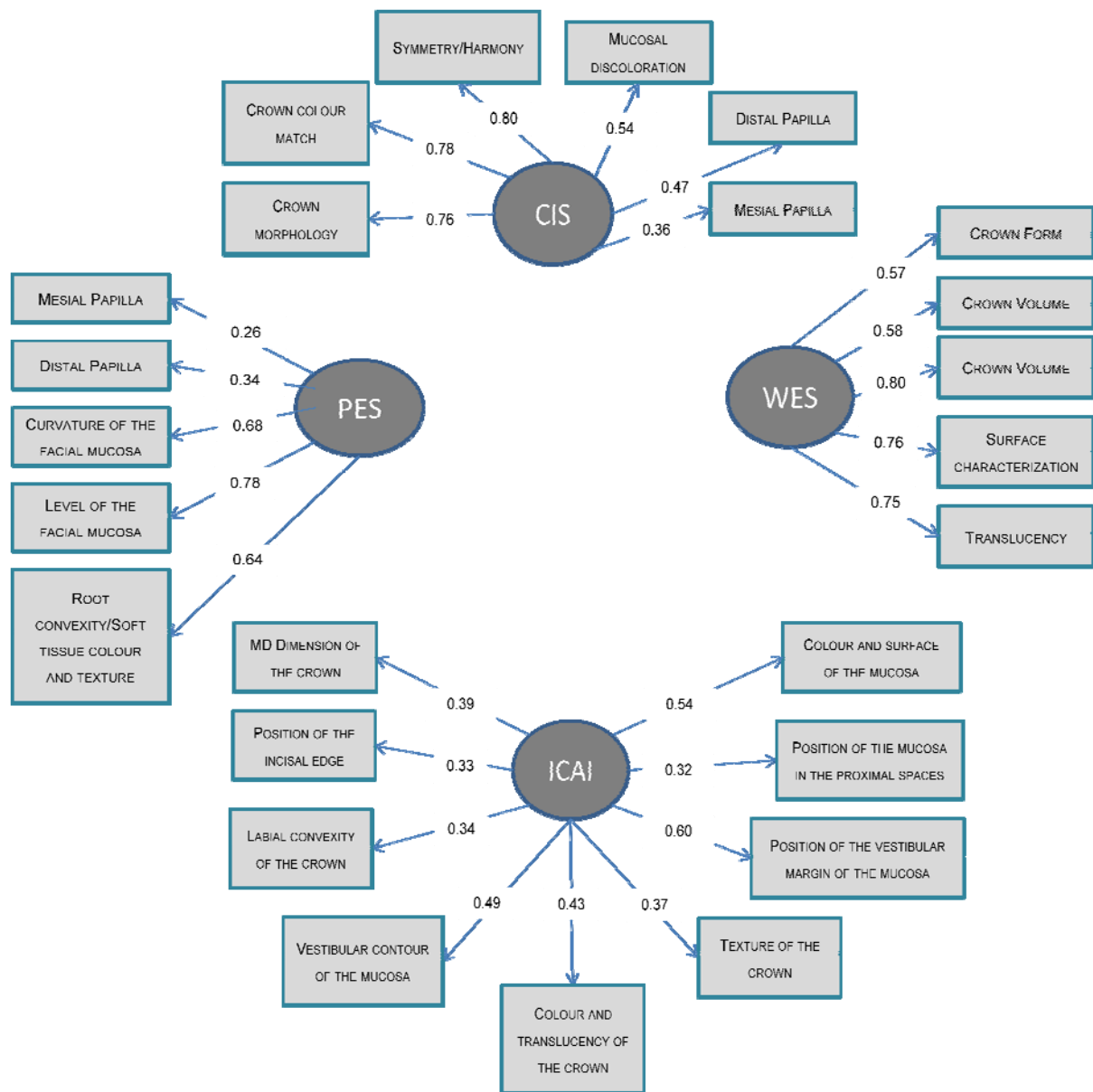
$p=0$  ( $<0.05$ )

$K=0.14$  (poor)



### 3.4 - AESTHETIC PREDICTIVE FACTORS

**DIAGRAM 2 – IMPACT OF THE PARAMETERS ON THE FINAL SCORE OF THE INDEXES**



As the indexes have internal consistency judged individually, the authors wanted to learn if, judged simultaneously, they had something in common. With the use of structural equation modelling, we created a model to test the hypothesis and to confirm relationships among observed and latent variables. With this, we could explore the interaction effects between variables. The RMSEA for this model was 0.019, which means that they have a close fit. Briefly, collectively, they measure the same matter.

Diagram 2 illustrates the relationship between the independent and the dependent variables associated, giving information regarding which of the independent variables is the most influential. That means that in this diagram it is possible to identify the aesthetic parameter that contributes most

to the outcome of the index associated. They are soft tissue contour (0.78), soft tissue level (0.68), colour (0.8) and characterization of the crown (0.76), the position of the vestibular margin of the peri-implant mucosa (0.6), the colour and surface of the mucosa (0.54), symmetry/harmony (0.8) and colour of the crown (0.78).

### 3.5 - AESTHETIC OUTCOME OF ZIRCONIA AND TITANIUM ABUTMENTS

The scores obtained from the different indexes regarding the cases with zirconia and titanium abutments were compared. To do so, they were divided into categories, “Aesthetic” and “Poor aesthetic”, according to the cut-points of each index.

As illustrated in Table LXII, the evaluation with the *PES/WES* and the *CIS* indexes results in similar outcomes, as zirconia is mostly evaluated as having an aesthetic outcome and titanium as having a poor aesthetic outcome ( $p < 0.05$ ).

The *ICAI*, in contrast, is very similar regarding its evaluation of both abutment materials ( $p > 0.05$ ).

TABLE LXII – ZIRCONIA VS. TITANIUM

		Abutment			
		Zirconia		Titanium	
		n	%	n	%
<b>PES/WES</b>	Poor aesthetic	41	33.9%	80	<u>66.1%*</u>
	Aesthetic	92	<u>50.3%*</u>	91	49.7%
<b>ICAI</b>	Poor aesthetic	90	41.5%	127	58.5%
	Aesthetic	43	49.4%	44	50.6%
<b>CIS</b>	Poor aesthetic	42	33.1%	85	<u>66.9%</u>
	Aesthetic	91	<u>51.4%*</u>	86	48.6%

\* The Chi-square statistic is significant at the .05 level

The intercorrelation between the abutment material and the implant position was calculated by means of the Cramer's V test (Cramer's  $V = 0.664$ ), which means that in 44% of the cases, the abutment material was chosen according to the implant position.

### **3.6 - PATIENT SATISFACTION**

All patients answered the questionnaire. Question 1 specifically focused on patient satisfaction with the soft tissue's aesthetic outcome. All patients located their satisfaction above the 70% mark on the VAS, leading to a mean score of 94%. Question 2 aimed for the evaluation of patient satisfaction with the crown's aesthetic outcome. All patients located their satisfaction above the 80% mark on the VAS, which led to a mean score of 97%. All said they would repeat the treatment if needed and would recommend it to others.

## 4 - DISCUSSION

Aesthetic perception and evaluation is of paramount importance in both the decision towards the treatment suitable for a certain patient, as well as its performance on a short and long-term basis. However, notwithstanding the relevance of the aesthetic outcome, particularly in anterior maxillary implant single-unit restorations, current literature concerned this is scarce. Not until recent years, has research within Implantology started to include the aesthetic outcome as a success criterion, by means of indexes that take into consideration both crown and gingival aspects assumed to influence it. So, objective indexes may be useful tools to plan a rehabilitation, to evaluate the quality of the executed surgical and prosthetic procedures and to measure possible changes over time.

### 4.1 - PROTOCOL

Regarding the photographic protocol, we can assume that it was adequate, given that there is a substantial inter-investigator agreement, as well as correlation between the clinical and photographic evaluation mean scores with each index. The utilization of an occlusal photograph as a tool to evaluate aspects related to volume has not been referenced in the recent literature. We believe that it contributed to the acknowledgement of soft tissue, bone or even crown contour deficiencies that otherwise could not have been accurately evaluated. Furthermore, the utilization of actual photographs for the assessment of aesthetics could have been another reason for this substantial relationship. In a study (Meijer *et al.* 2005)(8) where the assessment was made using photographs projected on a screen, the authors pointed out limitations regarding the perception of real colour and surface characteristics, given that they were difficult to examine. With the method chosen for this study, this limitation was eliminated, as the parameters that revealed perfect agreement were crown texture and translucency, which may be due to the quality of the image captured and of the photographic paper that was used. This indicates that photographs are an excellent method for the assessment of single-unit implant restorations and validates the internal process and its accuracy. However, the worst agreement concerns the distal papilla ( $k=0.19$ ), which means that, although the photographic protocol is good, attention must be taken to capture the distal papilla in a way that ensures its assessment and comparison. This can be ensured by an orthogonal photograph, directed to the central point of the crown.

The SAC Assessment Tool and several other studies consider the lip line as an important criteria regarding aesthetics. It is easy to understand that a full exposure of the gingiva margin is associated to a more sensitive and risky rehabilitation compared to a situation where there is no exposure of papillae. Thus, it is the opinion of the authors that lip line should be included in an index aimed at the evaluation of aesthetic outcome. As noticed during the control visits, patients could not give a wide smile when requested, which may be due to inhibition or embarrassment. However, as the visit proceeded and they were more relaxed, their smile became natural. This is why the authors support the opinion that these photographs should be executed at the end of the visit. Video is perhaps a better tool to evaluate lip line, as this is measured not only when smiling, but also during function.

#### 4.2 – PATIENT SATISFACTION

The global opinion of the patients involved in this study, regarding their satisfaction towards the rehabilitation, is extremely good. As we have no information about the initial state, we cannot establish if this general opinion is due to the result of the procedure or to the low expectations based on how they looked before.

#### 4.3 - COMPARISON BETWEEN INDEXES

Within the context of this study, the *PES/WES* and *CIS* indexes led to similar assessments, whereas the *ICA* considered the majority of the cases as having a poor aesthetic outcome. It can be hypothesized that this fact is due to the structure of the index itself: some parameters are evaluated on a five-point rating scale and others on a three-point rating scale, which forces the observer to assume a more critical position towards the rehabilitation, notwithstanding the fact that it is somewhat confusing. Moreover, the cut-point between an aesthetic and an unaesthetic outcome is 5, meaning that a single major deviation or several minor deviations from the reference tooth are sufficient to classify the rehabilitation as an aesthetical failure. As such, the information collected from the *ICA* is not easily understandable, given that the range of unaesthetic possibilities concerning the final score is rather large and making it difficult to comprehend the difference between, for example a score of 8 or a score of 14.

On the other hand, the *PES/WES* and the *CIS* indexes are believed to have a linear relationship as far as aesthetic outcome is concerned, meaning that, for the *PES/WES* index, the higher the better, whereas for the *CIS*, the lower the better. They are simpler to use and their outcome is more descriptive of the outcome: an outcome closer to 20 in the *PES/WES* index and closer to 6 in the *CIS* is more aesthetically successful.

#### 4.4 - SPECIALIZATION GROUPS

According to the current pilot study, there is no group in particular that always gives the highest and lowest scores in each case. Furthermore, their mean score are quite similar. This is probably due to the limited number of professionals in each specialization group. However, they all agree with respect to the attribution of best and worst aesthetic outcome (patient #14 and #6, respectively). This may suggest that the global perception of aesthetics is similar and it is simple to distinguish an aesthetic from an unaesthetic outcome. (3,8,15,18)

#### 4.5 - ASSESSMENT METHOD

The method applied for the assessment of the aesthetic outcome was exhaustive and lengthy, taking a minimum time of 30 minutes. Allied to the fact that the majority of the assessments were executed during or after periods of consultations, it was expected that the observers could have been tired and with less than full possession of their capacity of analysis. This probably influenced their answers. In order to minimize fatigue, the authors suggest the assessment of only one or two photographs by as

many observers as possible, using the same grids as the ones used in the present pilot study, instead of several photographs to be evaluated by some observers. This would also bring reproducibility to the study.

#### **4.6 - AESTHETIC PREDICTIVE FACTORS**

The importance of knowing which parameters contribute most to the overall aesthetic outcome is essential. The present pilot study concluded that parameters concerning soft-tissue contour, level, colour and texture, as well as colour and characterization of the crown and symmetry/harmony are the ones that aid in differentiating an aesthetic outcome from an unaesthetic one. This is a significant information, as it allows the professional to pay more attention to surgical and prosthetic procedures that may influence these aspects.

#### **4.7 - AESTHETIC OUTCOME OF ZIRCONIA AND TITANIUM ABUTMENTS**

According to the final scores of the *PES/WES* and *CIS* indexes, the cases with zirconia abutments fared better than those with titanium. According to the literature, this was the expected outcome. However, as we have no information regarding previous surgical procedures, the statement of the ultimate conclusion that zirconia gives more aesthetical results when compared to titanium cannot be made. A randomized clinical trial (RCT) with all the variables known and controlled in a long-term basis seems the best approach to eventually answer this question. We also established that in almost 44% of the cases, the choice of the abutment material was influenced by the implant's position, which is also corroborated by other studies.(5,10,13,20,22,26)

## 5 - CONCLUSION

Within the limitations of this pilot study, we can conclude that:

- From the three indexes employed in this study, the *PES/WES* index appears to be the most consistent. This means that it is probably the best to be implemented for a previous evaluation of the case, in order to visualize possible needs and avoid complications, as well as to assess the aesthetic outcome regarding implant single-unit restorations. However, it lacks aspects related to overall aesthetics, such as the evaluation of lip line and considerations regarding smile and facial harmony;
- The protocol proposed is suitable to be employed when planning future rehabilitations and their subsequent assessment, as it registers the initial conditions of the parameters. However, attention referring to the accurate documentation of the distal papilla and the collection of an occlusal photograph perpendicular to the occlusal plane should be given.
- According to the information collected for this pilot study, the cases with zirconia abutments were considered to have a better aesthetic outcome when compared to those with titanium abutments. However, we must keep in mind that the study group consists of a convenience group. So, prospective RCT should be executed in order to provide a solid answer.
- The parameters that were taken as the most influential regarding the final aesthetic outcome were: soft tissue colour, texture, contour and level; crown colour and characterization; symmetry and harmony. So, these are the aspects that the professional should give more emphasis to when planning an implant-single unit restoration to ensure its successful aesthetic outcome.

## 6 - STUDY LIMITATIONS AND FUTURE PERSPECTIVES

As LIMITATIONS of this pilot study, we can include:

- The lack of patient information, such as previous surgical procedures, implant position, material of the abutments and load protocols.
- The unavailability and lack of assiduity of the patients affected the overall study.
- There could have been more photographs, including some of the smile and contralateral tooth in the cases of premolars.
- The number of observers involved: there could have been more and from different specialization groups

As FUTURE PERSPECTIVES, we can include:

- The same data base could be used as a tool, in which every implant rehabilitation should be registered, in order to enhance the sharing of information and avoid the difficulties found in this study;
- Application of this protocol in future implants single-unit restorations, in prospective studies, with adequate documentation of the surgical and prosthetic procedures executed, aiming for the understanding of their consequence concerning aesthetic outcome. As this only concerns single-unit restorations, the authors aim to establish a protocol/index suitable for multiple rehabilitations, either partial or total;
- As patients' assessment of the aesthetic outcome constitutes a factor of success, it is the intention of the authors to understand the differences between patients' and professionals' opinions related to the same cases. To do so, patients could be instructed on how to fill in an index and their parameters, and evaluate the same cases as professionals.



## 7 - REFERENCES

1. Gallucci GO, Grütter L, Nedir R, Bischof M, Belser UC. Esthetic outcomes with porcelain-fused-to-ceramic and all-ceramic single-implant crowns: a randomized clinical trial. *Clin Oral Implants Res* [Internet]. 2011 Jan [cited 2014 Jul 9];22(1):62–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21158931>
2. Cosyn J, De Rouck T. Aesthetic outcome of single-tooth implant restorations following early implant placement and guided bone regeneration: crown and soft tissue dimensions compared with contralateral teeth. *Clin Oral Implants Res* [Internet]. 2009 Oct [cited 2014 Jul 9];20(10):1063–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19519788>
3. Gehrke P, Degidi M, Lulay-Saad Z, Dhom G. Reproducibility of the implant crown aesthetic index--rating aesthetics of single-implant crowns and adjacent soft tissues with regard to observer dental specialization. *Clin Implant Dent Relat Res* [Internet]. 2009 Sep [cited 2014 Jul 9];11(3):201–13. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18657148>
4. Jung RE, Holderegger C, Sailer I, Khraisat A, Suter A, Hämmerle CHF. The effect of all-ceramic and porcelain-fused-to-metal restorations on marginal peri-implant soft tissue color: a randomized controlled clinical trial. *Int J Periodontics Restorative Dent* [Internet]. 2008 Aug;28(4):357–65. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18717374>
5. Linkevicius T, Apse P. Influence of abutment material on stability of peri-implant tissues: a systematic review. *Int J Oral Maxillofac Implants* [Internet]. 2008;23(3):449–56. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18700367>
6. Wenzel A. Versus Delayed Placement of Single-Tooth Implants : A Controlled Clinical Trial. 2005;753–61.
7. Fürhauser R, Florescu D, Benesch T, Haas R, Mailath G, Watzek G. Evaluation of soft tissue around single-tooth implant crowns: the pink esthetic score. *Clin Oral Implants Res* [Internet]. 2005 Dec [cited 2014 Jul 9];16(6):639–44. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16307569>
8. Meijer HJ a, Stellingsma K, Meijndert L, Raghoobar GM. A new index for rating aesthetics of implant-supported single crowns and adjacent soft tissues--the Implant Crown Aesthetic Index. *Clin Oral Implants Res* [Internet]. 2005 Dec [cited 2014 Jul 9];16(6):645–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16307570>
9. Santing HJ, Raghoobar GM, Vissink A, den Hartog L, Meijer HJ a. Performance of the Straumann Bone Level Implant system for anterior single-tooth replacements in augmented and nonaugmented sites: a prospective cohort study with 60 consecutive patients. *Clin Oral Implants Res* [Internet]. 2013 Aug [cited 2014 Jul 9];24(8):941–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22540833>
10. Van Brakel R, Noordmans HJ, Frenken J, de Roode R, de Wit GC, Cune MS. The effect of zirconia and titanium implant abutments on light reflection of the supporting soft tissues. *Clin Oral Implants Res* [Internet]. 2011 Oct [cited 2014 Jul 9];22(10):1172–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21251080>
11. Teughels W, Merheb J, Quirynen M. Critical horizontal dimensions of interproximal and buccal bone around implants for optimal aesthetic outcomes: a systematic review. *Clin Oral Implants Res* [Internet]. 2009 Sep [cited 2014 Jul 9];20 Suppl 4:134–45. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19663960>
12. Juodzbals G, Wang H-L. Soft and hard tissue assessment of immediate implant placement: a case series. *Clin Oral Implants Res* [Internet]. 2007 Apr [cited 2014 Jul 9];18(2):237–43. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17348889>
13. Happe A, Schulte-Mattler V, Fickl S, Naumann M, Zöller JE, Rothamel D. Spectrophotometric assessment of peri-implant mucosa after restoration with zirconia abutments veneered with fluorescent ceramic: a controlled, retrospective clinical study. *Clin Oral Implants Res* [Internet]. 2013 Aug [cited 2014 Jul 9];24 Suppl A:28–33. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22145809>

14. Vilhjálmsson VH, Klock KS, Størksen K, Bårdsen A. Aesthetics of implant-supported single anterior maxillary crowns evaluated by objective indices and participants' perceptions. *Clin Oral Implants Res* [Internet]. 2011 Dec [cited 2014 Jul 9];22(12):1399–403. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21443608>
15. Hosseini M, Gotfredsen K. A feasible, aesthetic quality evaluation of implant-supported single crowns: an analysis of validity and reliability. *Clin Oral Implants Res* [Internet]. 2012 Apr [cited 2014 Jul 9];23(4):453–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21443589>
16. Mangano F, Mangano C, Ricci M, Sammons RL, Shibli JA, Piattelli A. Single-tooth Morse taper connection implants placed in fresh extraction sockets of the anterior maxilla: an aesthetic evaluation. *Clin Oral Implants Res* [Internet]. 2012 Nov [cited 2014 Jul 9];23(11):1302–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22092363>
17. Suphanantachat S, Thovanich K, Nisapakultorn K. The influence of peri-implant mucosal level on the satisfaction with anterior maxillary implants. *Clin Oral Implants Res* [Internet]. 2012 Sep [cited 2014 Jul 9];23(9):1075–81. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22892063>
18. Gehrke P, Lobert M, Dhom G. Reproducibility of the pink esthetic score--rating soft tissue esthetics around single-implant restorations with regard to dental observer specialization. *J Esthet Restor Dent* [Internet]. 2008 Jan [cited 2014 Jul 9];20(6):375–84; discussion 385. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19120783>
19. Fürhauser R, Florescu D, Benesch T, Haas R, Mailath G, Watzek G. Evaluation of soft tissue around single-tooth implant crowns: the pink esthetic score. *Clin Oral Implants Res* [Internet]. 2005 Dec [cited 2014 Jul 9];16(6):639–44. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16307569>
20. Bressan E, Paniz G, Lops D, Corazza B, Romeo E, Favero G. Influence of abutment material on the gingival color of implant-supported all-ceramic restorations: a prospective multicenter study. *Clin Oral Implants Res* [Internet]. 2011 Jun [cited 2014 Jul 9];22(6):631–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21070378>
21. Fu J-H, Lee A, Wang H-L. Influence of tissue biotype on implant esthetics. *Int J Oral Maxillofac Implants* [Internet]. 2011;26(3):499–508. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21691596>
22. Zembic A, Bösch A, Jung RE, Hämmerle CHF, Sailer I. Five-year results of a randomized controlled clinical trial comparing zirconia and titanium abutments supporting single-implant crowns in canine and posterior regions. *Clin Oral Implants Res* [Internet]. 2013 Apr [cited 2014 Jul 9];24(4):384–90. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23025514>
23. Le BT, Borzabadi-Farahani A. Labial Bone Thickness in Area of Anterior Maxillary Implants Associated with Crestal Labial Soft Tissue Thickness. *Implant Dent* [Internet]. 2012 Oct [cited 2014 Jul 9];21(5):406–10. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22983315>
24. Miranda O, Souza M De, Freitas AC De. Influence of tissue biotype in the morpho- esthetic-functional behavior of the peri-implant tissue : A literature review. 2012;6(2):56–66.
25. Esfahrood ZR, Kadkhodazadeh M, Talebi Ardakani MR. Gingival biotype: a review. *Gen Dent* [Internet]. 2013 Jul;61(4):14–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23823337>
26. Sailer I, Zembic A, Jung RE, Hämmerle CHF, Mattioli A. Single-tooth implant reconstructions: esthetic factors influencing the decision between titanium and zirconia abutments in anterior regions. *Eur J Esthet Dent* [Internet]. 2007 Jan;2(3):296–310. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19655552>

## 8 - ACKNOWLEDGMENTS

Apenas este espaço é insuficiente para agradecer aos que me apoiaram ao longo do meu percurso académico e, em especial, à conclusão desta fase. Assim, vou distinguir os que contribuíram com um pouco mais.

Ao Professor Fernando Guerra, por todos os saberes transmitidos e por me mostrar o que é ser um real apaixonado pela Medicina Dentária. Obrigada por me desafiar e me incentivar a ser cada vez melhor em tudo o que faça.

Ao Dr. João Paulo Tondela, por ter aceite o meu convite de me acompanhar neste percurso desafiante e me ter incentivado a ser e fazer mais e melhor, tanto em termos profissionais como pessoais. Este trabalho não seria possível sem o seu apoio e conhecimentos.

À Professora Margarida Pocinho, pela paciência demonstrada aquando da análise estatística e por, acima de tudo, o fazer com amizade.

Ao Engenheiro Manuel Cerqueira, pelos ensinamentos de matemática e por toda a paciência demonstrada. Obrigado tio.

Ao Professor Dave Tucker, pelos longos anos de convivência e por toda a dedicação.

A todos os professores e funcionários da Área da Medicina Dentária de Coimbra que me acompanharam nestes 5 anos.

Aos meus Amigos, por serem acima de tudo pessoas incríveis. Agradeço com especial carinho à Joana Pereira, por ter sido a minha companheira, confidente e amiga, todos os dias e em todos os momentos durante os 5 anos que passaram. Tornaste tudo muito mais fácil. À Inês e à Lurdes, por serem as minhas meninas, por me alegrarem o dia e por serem das pessoas mais espetaculares que tive o prazer de conhecer. Ao Luís, ao Jorge e ao José Francisco, por toda a amizade e pelo vosso apoio. À Beatriz, à Inês, à Catarina e à Débora, por crescerem comigo e por me darem o que de melhor alguém pode receber: amizade incondicional e verdadeira.

Ao Francisco, por me ter incentivado e dado força para fazer sempre o meu melhor. Obrigada pela confiança e pelo carinho.

À minha Família, em especial aos meus pais e à minha avó, por toda a paciência, amor, dedicação que sempre demonstraram, por me incentivarem e me apoiarem de forma incondicional em tudo o que faça. Obrigada do fundo do coração.

A todos vós, o meu sincero obrigado.

## 9 – ANNEX

### 9.1 - ANNEX 1: INFORMED CONSENT

---

#### FORMULÁRIO DE INFORMAÇÃO E CONSENTIMENTO INFORMADO

**TÍTULO DO PROJECTO DE INVESTIGAÇÃO:** Avaliação dos resultados estéticos de restaurações unitárias sobre implantes com pilares metálicos e cerâmicos com recurso a índices estéticos objetivos – estudo piloto.

**PROTOCOLO Nº**

**INVESTIGADOR COORDENADOR**

Ana Catarina Fernandes da Costa

Dr. João Paulo dos Santos Tondela

Prof. Doutor Fernando Alberto Deométrie Rodrigues Alves Guerra

**CENTRO DE ESTUDO:** Departamento de Medicina Dentária, Estomatologia e Cirurgia MaxiloFacial da Faculdade de Medicina da Universidade de Coimbra - Avenida Bissaya Barreto, 3000-075 Coimbra

**INVESTIGADOR PRINCIPAL:** Ana Catarina Fernandes da Costa

**MORADA:** Rua da Escola 29B, Pousada, 3040-792 Cernache

**CONTACTO TELEFÓNICO:** 916897404

**NOME DO PACIENTE:** \_\_\_\_\_

É convidado(a) a participar voluntariamente neste estudo porque apresenta uma reabilitação unitária sobre um implante no sector anterior estético, com pilar protético metálico/cerâmico e uma coroa metalocerâmica/total cerâmica, tendo o dente contralateral natural.

Este documento é chamado consentimento informado e descreve a finalidade do estudo, os procedimentos, os

possíveis benefícios e riscos. A sua participação poderá contribuir para melhorar o conhecimento sobre os resultados estéticos de diferentes materiais utilizados nos pilares e coroas, bem como na sua perceção por profissionais das variadas especialidades da Medicina Dentária.

Receberá uma cópia deste Consentimento Informado para rever e solicitar aconselhamento de familiares e amigos. O Investigador ou outro membro da sua equipa irá esclarecer qualquer dúvida que tenha sobre o termo de consentimento e também alguma palavra ou informação que possa não entender.

Depois de compreender o estudo e de não ter qualquer dúvida acerca do mesmo, deverá tomar a decisão de participar ou não. Caso queira participar, ser-lhe-á solicitado que assine e date este formulário. Após a sua assinatura e a do Investigador, ser-lhe-á entregue uma cópia. Caso não queira participar, não haverá qualquer penalização nos cuidados que irá receber.

## **1. INFORMAÇÃO GERAL E OBJETIVOS DO ESTUDO**

Este estudo irá decorrer no Departamento de Medicina Dentária da Faculdade de Medicina da Universidade de Coimbra, em colaboração com o Prof. Doutor Fernando Alberto Deométrio Rodrigues Alves Guerra e Dr. João Paulo dos Santos Tondela, com o objetivo de avaliar os resultados estéticos de restaurações unitárias sobre implantes com pilares metálicos e cerâmicos, por meio de índices estéticos objetivos.

Trata-se de um estudo clínico, no qual serão efetuadas avaliações de parâmetros clínicos, fotografias, impressões para obtenção de modelos de estudo e radiografias. Não será feita nenhuma alteração na sua medicação ou tratamentos habituais.

Este estudo foi aprovado pela Comissão de Ética da Faculdade Medicina da Universidade de Coimbra (FMUC) de modo a garantir a proteção dos direitos, segurança e bem-estar de todos os doentes ou outros participantes incluídos e garantir prova pública dessa proteção.

Como participante neste estudo beneficiará da vigilância e apoio do seu médico, garantindo assim a sua segurança.

## **2. PROCEDIMENTOS E CONDUÇÃO DO ESTUDO**

### **2.1. Procedimentos**

Inicialmente, será efetuada uma **breve observação oral**, de modo a averiguar os níveis de higiene oral. Se estes se revelarem insatisfatórios, será executada uma **higienização sumária**. Caso este procedimento não seja necessário, ser-lhe-ão tiradas **fotografias** não identificadas, para posterior avaliação da estética. É de notar que

se a higienização for feita, e devido ao facto de comprometer coloração dos tecidos moles (parâmetro a ser avaliado), as fotografias terão que ser efetuadas numa consulta posterior. Segue-se a análise dos **parâmetros clínicos**, como por exemplo a avaliação do índice de placa bacteriana, bem como dos parâmetros que constam nos índices estéticos. Estes últimos exigem apenas uma análise observacional. Seguidamente, serão efetuadas impressões parciais e totais de ambas as arcadas. Numa eventual segunda consulta, será efetuada uma radiografia do implante e as fotografias, pela razão mencionada anteriormente.

## **2.2. Calendário das visitas/ Duração (exemplo)**

Este estudo consiste numa visita única/dupla com duração de cerca de 1 hora, no máximo.

### **Descrição dos Procedimento**

Serão realizados os seguintes procedimentos/exames:

- Observação Oral
- Fotografias
- Análise Clínica
- Impressões de estudo
- Radiografias

## **2.3. Tratamento de dados/ Randomização**

Os dados serão arquivados pelos investigadores, preservando a identidade do doente. Serão alvo de análise por terceiros. Trata-se de uma amostra de conveniência.

## **3. RISCOS E POTENCIAIS INCONVENIENTES PARA O DOENTE**

Todos os procedimentos são usualmente efetuados em qualquer consulta de controlo de uma reabilitação com implantes. Destes, as radiografias poderão ser o que apresenta maior risco, dado ao facto de ter radiação envolvida. Contudo, como será efetuada apenas uma radiografia, os riscos que advêm do efeito cumulativo de radiação são minimizados, sendo estes já por si reduzidos. Para além disso, o doente será protegido por um colete de chumbo, funcionando como um escudo contra a radiação.

## **4. POTENCIAIS BENEFÍCIOS**

Este estudo efetua uma avaliação pormenorizada de todos os fatores que contribuem para o sucesso de uma reabilitação unitária sobre implantes e compara os resultados estéticos de dois tipos de materiais. Assim, vai permitir monitorizar e controlar a reabilitação efetuada, avaliando o sucesso a prazo do mesmo. Para além disso, melhora o conhecimento das divergências entre os materiais, contribuindo para uma melhor informação dos Médicos Dentistas nos cuidados clínicos a prestar a doentes com situações idênticas à sua. Pelo facto de

utilizar vários índices e de efetuar a comparação entre eles e por vários profissionais das diversas especialidades da Medicina Dentária, poderá também auxiliar na determinação do índice com maior validade e conhecer as diferenças na perceção da Estética consoante a especialização. Finalmente, como também implica a recolha da análise estética por parte do doente, possibilitará aos profissionais apreender os aspetos aos quais o doente dá mais importância numa reabilitação desta natureza.

## **5. NOVAS INFORMAÇÕES**

Ser-lhe-á dado conhecimento de qualquer nova informação que possa ser relevante para a sua condição ou que possa influenciar a sua vontade de continuar a participar no estudo.

## **6. TRATAMENTOS ALTERNATIVOS**

Trata-se de um controlo e não de um tratamento.

## **7. SEGURANÇA**

Este estudo não é segurado por nenhuma entidade. Não se justifica.

## **8. PARTICIPAÇÃO/ ABANDONO VOLUNTÁRIO**

É inteiramente livre de aceitar ou recusar participar neste estudo. Pode retirar o seu consentimento em qualquer altura sem qualquer consequência para si, sem precisar de explicar as razões, sem qualquer penalidade ou perda de benefícios e sem comprometer a sua relação com o Investigador que lhe propõe a participação neste estudo. Ser-lhe-á pedido para informar o Investigador se decidir retirar o seu consentimento.

O Investigador do estudo pode decidir terminar a sua participação neste estudo se entender que não é do melhor interesse para a sua saúde continuar nele. A sua participação pode ser também terminada se não estiver a seguir o plano do estudo, por decisão administrativa ou decisão da Comissão de Ética. O médico do estudo notificará-lo-á se surgir uma dessas circunstâncias, e falará consigo a respeito da mesma.

## **9. CONFIDENCIALIDADE**

Sem violar as normas de confidencialidade, serão atribuídos a auditores e autoridades reguladoras acesso aos registos médicos para verificação dos procedimentos realizados e informação obtida no estudo, de acordo com as leis e regulamentos aplicáveis. Os seus registos manter-se-ão confidenciais e anonimizados de acordo com os regulamentos e leis aplicáveis. Se os resultados deste estudo forem publicados a sua identidade manter-se-á confidencial.

Ao assinar este Consentimento Informado autoriza este acesso condicionado e restrito.

Pode ainda em qualquer altura exercer o seu direito de acesso à informação. Pode ter também acesso à sua informação médica diretamente ou através do seu médico neste estudo. Tem também o direito de se opor à transmissão de dados que sejam cobertos pela confidencialidade profissional.

Os registos médicos que o identificarem e o formulário de consentimento informado que assinar serão verificados para fins do estudo pelo promotor e/ou por representantes do promotor, e para fins regulamentares pelo promotor e/ou pelos representantes do promotor e agências reguladoras noutros países. A Comissão de Ética responsável pelo estudo pode solicitar o acesso aos seus registos médicos para assegurar-se que o estudo está a ser realizado de acordo com o protocolo. Não pode ser garantida confidencialidade absoluta devido à necessidade de passar a informação a essas partes.

Ao assinar este termo de consentimento informado, permite que as suas informações médicas neste estudo sejam verificadas, processadas e relatadas conforme for necessário para finalidades científicas legítimas.

#### **Confidencialidade e tratamento de dados pessoais**

Os dados pessoais dos participantes no estudo, incluindo a informação médica ou de saúde recolhida ou criada como parte do estudo, (tais como registos médicos ou resultados de testes), serão utilizados para condução do estudo, designadamente para fins de investigação científica. Ao dar o seu consentimento à participação no estudo, a informação a si respeitante, designadamente a informação clínica, será utilizada da seguinte forma:

1. Os investigadores e as outras pessoas envolvidas no estudo recolherão e utilizarão os seus dados pessoais para as finalidades acima descritas.
2. Os dados do estudo, associados às suas iniciais ou a outro código que não o (a) identifica diretamente (e não ao seu nome) serão comunicados pelos investigadores e outras pessoas envolvidas no estudo ao promotor do estudo, que os utilizará para as finalidades acima descritas.
3. Os dados do estudo, associados às suas iniciais ou a outro código que não permita identificá-lo(a) diretamente, poderão ser comunicados a autoridades de saúde nacionais e internacionais.
4. A sua identidade não será revelada em quaisquer relatórios ou publicações resultantes deste estudo.
5. Todas as pessoas ou entidades com acesso aos seus dados pessoais estão sujeitas a sigilo profissional.
6. Ao dar o seu consentimento para participar no estudo, autoriza o promotor ou empresas de monitorização de estudos/estudos especificamente contratadas para o efeito e seus colaboradores e/ou autoridades de saúde, a aceder aos dados constantes do seu processo clínico, para conferir a informação recolhida e registada pelos investigadores, designadamente para assegurar o rigor dos dados que lhe dizem respeito e para garantir que o estudo se encontra a ser desenvolvido corretamente e que os dados obtidos são fiáveis.



7. Nos termos da lei, tem o direito de, através de um dos médicos envolvidos no estudo/estudo, solicitar o acesso aos dados que lhe digam respeito, bem como de solicitar a retificação dos seus dados de identificação.
8. Tem ainda o direito de retirar este consentimento em qualquer altura através da notificação ao investigador, o que implicará que deixe de participar no estudo/estudo. No entanto, os dados recolhidos ou criados como parte do estudo até essa altura que não o+a) identifique poderão continuar a ser utilizados para o propósito de estudo/estudo, nomeadamente para manter a integridade científica do estudo, e a sua informação médica não será removida do arquivo do estudo.
9. Se não der o seu consentimento, assinando este documento, não poderá participar neste estudo. Se o consentimento agora prestado não for retirado e até que o faça, este será válido e manter-se-á em vigor.

#### **10. COMPENSAÇÃO**

Este estudo é da iniciativa do investigador e, por isso, se solicita a sua participação sem uma compensação financeira para a sua execução, tal como também acontece com os investigadores e o Centro de Estudo. No entanto, se além da visita prevista, planeada de acordo com a atual prática clínica, lhe forem solicitadas visitas suplementares no âmbito deste estudo, as despesas decorrentes dessas deslocações e eventuais perdas salariais ser-lhe-ão reembolsadas. O Centro de Estudo suportará todos os custos inerentes aos procedimentos das visitas. Não haverá portanto qualquer custo para o participante pela sua participação neste estudo.

#### **11. CONTACTOS**

Se tiver perguntas relativas aos seus direitos como participante deste estudo, deve contactar:

Presidente da Comissão de Ética da FMUC,

Azinhaga de Santa Comba, Celas – 3000-548 Coimbra

Telefone: 239 857 707

e-mail: [comissaoetica@fmed.uc.pt](mailto:comissaoetica@fmed.uc.pt)

Se tiver questões sobre este estudo deve contactar:

**INVESTIGADOR PRINCIPAL:** Ana Catarina Fernandes da Costa

**MORADA:** Rua da Escola 29B, Pousada, 3040-792 Cernache

**CONTACTO TELEFÓNICO:** 916897404

NÃO ASSINE ESTE FORMULÁRIO DE CONSENTIMENTO INFORMADO A MENOS QUE TENHA TIDO A OPORTUNIDADE DE PERGUNTAR E TER RECEBIDO

RESPOSTAS SATISFATÓRIAS A TODAS AS SUAS PERGUNTAS.

### **CONSENTIMENTO INFORMADO**

De acordo com a Declaração de Helsínquia da Associação Médica Mundial e suas atualizações:

1. Declaro ter lido este formulário e aceito de forma voluntária participar neste estudo.
2. Fui devidamente informado(a) da natureza, objetivos, riscos, duração provável do estudo, bem como do que é esperado da minha parte.
3. Tive a oportunidade de fazer perguntas sobre o estudo e percebi as respostas e as informações que me foram dadas. A qualquer momento posso fazer mais perguntas ao médico responsável do estudo. Durante o estudo e sempre que quiser, posso receber informação sobre o seu desenvolvimento. O médico responsável dará toda a informação importante que surja durante o estudo que possa alterar a minha vontade de continuar a participar.
4. Aceito que utilizem a informação relativa à minha história clínica e os meus tratamentos no estrito respeito do segredo médico e anonimato. Os meus dados serão mantidos estritamente confidenciais. Autorizo a consulta dos meus dados apenas por pessoas designadas pelo promotor e por representantes das autoridades reguladoras.
5. Aceito seguir todas as instruções que me forem dadas durante o estudo. Aceito em colaborar com o médico e informá-lo(a) imediatamente das alterações do meu estado de saúde e bem-estar e de todos os sintomas inesperados e não usuais que ocorram.
6. Autorizo o uso dos resultados do estudo para fins exclusivamente científicos e, em particular, aceito que esses resultados sejam divulgados às autoridades sanitárias competentes.
7. Aceito que os dados gerados durante o estudo sejam informatizados pelo promotor ou outrem por si designado.

Eu posso exercer o meu direito de retificação e/ ou oposição.

8. Tenho conhecimento que sou livre de desistir do estudo a qualquer momento, sem ter de justificar a minha decisão e sem comprometer a qualidade dos meus cuidados médicos. Eu tenho conhecimento que o médico tem o direito de decidir sobre a minha saída prematura do estudo e que me informará da causa da mesma.

9. Fui informado que o estudo pode ser interrompido por decisão do investigador, do promotor ou das autoridades reguladoras.

**Nome do Participante** \_\_\_\_\_

**Assinatura:** \_\_\_\_\_ **Data:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Nome de Testemunha / Representante Legal:** \_\_\_\_\_

**Assinatura:** \_\_\_\_\_ **Data:** \_\_\_\_/\_\_\_\_/\_\_\_\_

Confirmo que expliquei ao participante acima mencionado a natureza, os objetivos e os potenciais riscos do  
Estudo acima mencionado.

**Nome do Investigador:** \_\_\_\_\_

**Assinatura:** \_\_\_\_\_ **Data:** \_\_\_\_/\_\_\_\_/\_\_\_\_

## 9.2 - ANNEX 2: VAS

### AVALIAÇÃO DOS RESULTADOS ESTÉTICOS DE RESTAURAÇÕES UNITÁRIAS SOBRE IMPLANTES COM PILARES METÁLICOS E CERÂMICOS COM RECURSO A ÍNDICES ESTÉTICOS OBJETIVOS – ESTUDO PILOTO

Com este documento, pretendemos obter a sua opinião relativamente aos resultados estéticos alcançados com a reabilitação efetuada.

#### QUESTÃO 1.

Numa escala de 0 a 10, como classifica a sua satisfação relativamente ao aspeto da gengiva (cor, textura, posição) sendo 0 extremamente insatisfeito(a) e 10 extremamente satisfeito(a). Desenhe uma cruz (X) sobre a linha abaixo no local que corresponder à sua resposta.

\_\_\_\_\_

0 10

#### QUESTÃO 2.

Numa escala de 0 a 10, como classifica a sua satisfação relativamente ao resultado estético da coroa (cor, forma, tamanho), sendo 0 extremamente insatisfeito(a) e 10 extremamente satisfeito(a). Desenhe uma cruz (X) sobre a linha abaixo no local que corresponder à sua resposta.

\_\_\_\_\_

0 10

#### QUESTÃO 3.

Recomendaria o tratamento? (tendo em conta o resultado estético obtido)

SIM ☐ NÃO ☐

#### QUESTÃO 4.

Repetiria o tratamento? Se não, porquê?

---

---

---

### 9.3 - ANNEX 3: CLINICAL AESTHETIC ASSESSMENT

#### AVALIAÇÃO DOS PARÂMETROS ESTÉTICOS NUMA REABILITAÇÃO COM IMPLANTES

#### ANÁLISE CLÍNICA

NOME DO PACIENTE:

POSIÇÃO DO IMPLANTE:

DATA:

PES	PAPILA MESIAL	AUSENTE	INCOMPLETA	COMPLETA
	PAPILA DISTAL	AUSENTE	INCOMPLETA	COMPLETA
	NÍVEL DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	CONTO RNO DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	DEFICIÊNCIA PROCESSO ALVEOLAR/COLORAÇÃO E TEXTURA DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

WES (BELSER ET AL. 2009)	FORMA DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	VOLUME DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	COR (MATIZ/VALOR)	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	TEXTURA SUPERFICIAL	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	TRANSLUCIDEZ	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

ICAI	1. DIMENSÃO MD DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	2. POSIÇÃO DO BORDO INCISAL DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	3. CONVEXIDADE VESTIBULAR DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	4. CONTO RNO VESTIBULAR DA SUPERFÍCIE DA MUCOSA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA

(MEIJER ET AL. 2005)	5. COR E TRANSLUCIDEZ DA COROA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	6. SUPERFÍCIE DA COROA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	7. POSIÇÃO DA MARGEM VESTIBULAR DA MUCOSA PERIIMPLANTAR		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	8. POSIÇÃO DA MUCOSA INTERDENTÁRIA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	9. COR E SUPERFÍCIE DA MUCOSA VESTIBULAR		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	

CIS (DUELED ET AL. 2009)	MORFOLOGIA DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	COR DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	SIMETRIA/HARMONIA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	DESCOLORAÇÃO DA MUCOSA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	PAPILA DISTAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	PAPILA MESIAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO

## 9.4 - ANNEX 4: CLINICAL ANALYSIS

AValiação dos Parâmetros Biológicos numa Reabilitação com Implantes

AValiação Clínica

NOME DO PACIENTE:

PROCESSO:

POSIÇÃO DO IMPLANTE (ASSINALAR NO ESQUEMA)

DATA:

Linha Labial

NENHUMA EXPOSIÇÃO DAS PAPILAS

☐

EXPOSIÇÃO DAS PAPILAS

☐

EXPOSIÇÃO TOTAL DA MARGEM GENGIVAL

☐

Biótipo Gengival

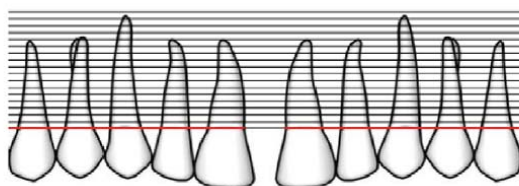
ESPESSE

☐

MÉDIO

☐

FINO

☐


<http://www.periodontalchart-online.com/es/>

DENTE	15				14				13				12				11				21				22				23				24				25			
	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M	D	P	V	M				
PD (mm)																																								
BOP (%)																																								
PI (%)																																								
MOBILIDADE																																								

### PROCEDIMENTOS ANTERIORMENTE EXECUTADOS

DATA DA CIRURGIA:

PROTOCOLO DE CARGA:

TIPO DE IMPLANTE:

REGENERAÇÃO ÓSSEA GUIADA

SIM

☐

NÃO

☐

PROVISÓRIO

SIM

☐

NÃO

☐

SPLIT CREST

SIM

☐

NÃO

☐

RETENÇÃO

CIMENTADA

☐

APARAFUSADA

☐

## 9.5 - ANNEX 5: AESTHETIC ASSESSMENT GRID

AVALIAÇÃO DOS PARÂMETROS ESTÉTICOS NUMA REABILITAÇÃO COM IMPLANTES

ANÁLISE DE FOTOGRAFIAS

NÚMERO DA FOTOGRAFIA:

PES	PAPILA MESIAL	AUSENTE	INCOMPLETA	COMPLETA
	PAPILA DISTAL	AUSENTE	INCOMPLETA	COMPLETA
	NÍVEL DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	CONTORNO DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	DEFICIÊNCIA PROCESSO ALVEOLAR/COLORAÇÃO E TEXTURA DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

WES (BELSER ET AL. 2009)	FORMA DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	VOLUME DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	COR (MATIZ/VALOR)	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	TEXTURA SUPERFICIAL	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
	TRANSLUCIDEZ	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

ICAI	1. DIMENSÃO MD DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	2. POSIÇÃO DO BORDO INCISAL DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	3. CONVEXIDADE VESTIBULAR DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
	4. CONTORNO VESTIBULAR DA SUPERFÍCIE DA MUCOSA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA

(MEIJER ET AL. 2005)	5. COR E TRANSLUCIDEZ DA COROA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	6. SUPERFÍCIE DA COROA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	7. POSIÇÃO DA MARGEM VESTIBULAR DA MUCOSA PERIIMPLANTAR		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	8. POSIÇÃO DA MUCOSA INTERDENTÁRIA		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	
	9. COR E SUPERFÍCIE DA MUCOSA VESTIBULAR		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	

CIS (DUELED ET AL. 2009)	MORFOLOGIA DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	COR DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	SIMETRIA/HARMONIA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	DESCOLORAÇÃO DA MUCOSA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	PAPILA DISTAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
	PAPILA MESIAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO

## 9.6 - ANNEX 6: EXPLANATION OF THE INDEXES

### AVALIAÇÃO DO RESULTADO ESTÉTICO DE RESTAURAÇÕES UNITÁRIAS SOBRE IMPLANTES COM PILARES CERÂMICOS E METÁLICOS COM RECURSO A ÍNDICES ESTÉTICOS OBJETIVOS – ESTUDO PILOTO

No âmbito do trabalho de tese sobre o tema “Avaliação do resultado estético de restaurações unitárias sobre implantes com pilares cerâmicos e metálicos com recurso a índices estéticos objetivos – estudo piloto”, da minha tese de mestrado, sob orientação científica do orientador Professor Doutor Fernando Alberto Deométrio Rodrigues Alves Guerra, e coorientador Doutor João Paulo dos Santos Tondela, venho por este meio solicitar a sua participação, através da avaliação do resultado estético sobre fotografias referentes a desaseis (16) pacientes, com recurso a alguns índices estéticos descritos na literatura: PES/WES, ICAI e CIS.

Ser-lhe-ão explicados os critérios dos demais índices, devendo para o efeito da avaliação, preencher as folhas que seguem em anexo.

Igualmente lhe solicito que informe relativamente às questões que se seguem:

#### Qual a sua formação?

MÉDICO DENTISTA ☐ ESTOMATOLOGISTA ☐ ESTUDANTE ☐ TÉCNICO DE PRÓTESE ☐

#### Área de especialização:

GENERALISTA ☐ PROSTODÔNCIA ☐ PERIODONTOLOGIA ☐ ORTODONTIA ☐ OUTROS ☐

**Ano de formatura/Ano que frequenta (estudantes) /Anos de trabalho (técnicos de prótese):** \_\_\_\_\_

**Tinha conhecimento prévio dos índices?** SIM ☐ NÃO ☐

Agradeço toda a disponibilidade dispensada.

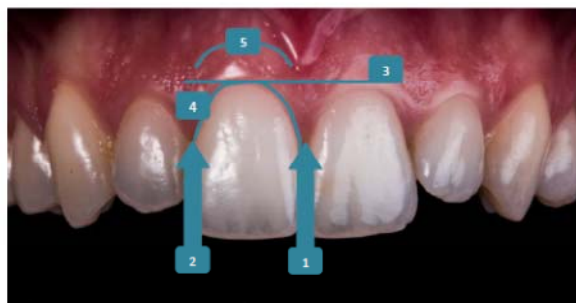
Saudações Académicas,  
Ana Catarina Fernandes da Costa



## PINK ESTHETIC SCORE (PES) E WHITE ESTHETIC SCORE (WES)

O *PES*, apresentado na figura, compreende a avaliação de cinco (5) parâmetros relativamente aos tecidos moles peri-implantares, quando comparados com os do dente de referência, isto é, o dente contralateral, caso o implante se apresente na zona dos incisivos ou caninos, ou o adjacente, caso se trate de um pré-molar:

1. PAPILA MESIAL
2. PAPILA DISTAL
3. NÍVEL DOS TECIDOS MOLES
4. CONTORNO DOS TECIDOS MOLES
5. DEFICIÊNCIA DO PROCESSO ALVEOLAR/COLORAÇÃO E TEXTURA DOS TECIDOS MOLES



O *WES* compreende a avaliação de cinco (5) parâmetros relativamente à coroa do implante, quando comparada com a do dente de referência.

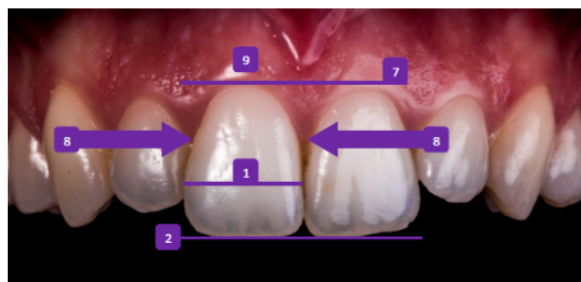
1. FORMA DO DENTE
2. VOLUME DO DENTE
3. COR (MATIZ/CROMA)
4. TEXTURA SUPERFICIAL
5. TRANSLUCIDEZ

A avaliação é feita consoante os critérios **AUSENTE/DISCREPÂNCIA MAJOR**, **INCOMPLETA/ DISCREPÂNCIA MINOR** ou **COMPLETA/SEM DISCREPÂNCIA**, como representado na tabela que se segue.

PAPILA MESIAL	AUSENTE	INCOMPLETA	COMPLETA
PAPILA DISTAL	AUSENTE	INCOMPLETA	COMPLETA
NÍVEL DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
CONTORNO DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
DEFICIÊNCIA PROCESSO ALVEOLAR/COLORAÇÃO E TEXTURA DOS TECIDOS MOLES	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
FORMA DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
VOLUME DO DENTE	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
COR (MATIZ/VALOR)	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
TEXTURA SUPERFICIAL	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA
TRANSLUCIDEZ	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

## IMPLANT CROWN AESTHETIC INDEX (ICAI)

O *ICAI* compreende a avaliação de nove (9) parâmetros, cinco dos quais relativamente à coroa do implante e os restantes quatro referentes aos tecidos moles peri-implantares. Este índice serve-se igualmente da comparação com o dente de referência para a avaliação do resultado estético.



- |  |  |
|--|--|
| 1. DIMENSÃO MESIODISTAL DA COROA               | 5. COR E TRANSLUCIDEZ DA COROA                           |
| 2. POSIÇÃO DO BORDO INCISAL DA COROA           | 6. SUPERFÍCIE DA COROA                                   |
| 3. CONVEXIDADE VESTIBULAR DA COROA             | 7. POSIÇÃO DA MARGEM VESTIBULAR DA MUCOSA INTERIMPLANTAR |
| 4. CONTORNO VESTIBULAR DA SUPERFÍCIE DA MUCOSA | 8. POSIÇÃO DA MUCOSA INTERDENTÁRIA                       |
|  | 9. COR E SUPERFÍCIE DA MUCOSA VESTIBULAR                 |

Os primeiros quatro (4) parâmetros referidos são avaliados numa escala de cinco (5) possíveis resultados estéticos, indo desde o **MUITO AUMENTADO(A)**, **MUITO DIMINUÍDO(A)**, **LIGEIRAMENTE AUMENTADO(A)**, **LIGEIRAMENTE DIMINUÍDO(A)** ou **SEM QUALQUER DIFERENÇA**. Os restantes cinco (5) parâmetros são avaliados numa escala de três (3) possíveis resultados os estéticos, variando entre o **DESVIO MAJOR**, **DESVIO MINOR** ou **SEM DESVIO**.

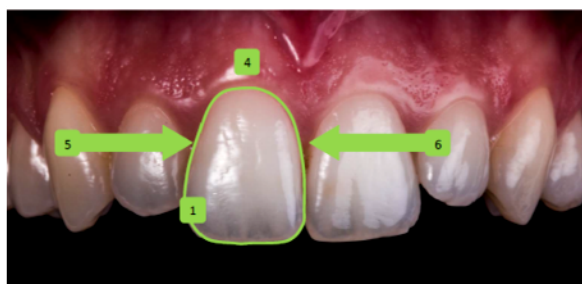
DIMENSÃO MD DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
POSIÇÃO DO BORDO INCISAL DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
CONVEXIDADE VESTIBULAR DA COROA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
CONTORNO VESTIBULAR DA SUPERFÍCIE DA MUCOSA	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
COR E TRANSLUCIDEZ DA COROA	DESVIO MAJOR SEM DESVIO DESVIO MINOR				
SUPERFÍCIE DA COROA	DESVIO MAJOR SEM DESVIO DESVIO MINOR				
POSIÇÃO DA MARGEM VESTIBULAR DA MUCOSA PERIIMPLANTAR	DESVIO MAJOR SEM DESVIO DESVIO MINOR				
POSIÇÃO DA MUCOSA INTERDENTÁRIA	DESVIO MAJOR SEM DESVIO DESVIO MINOR				
COR E SUPERFÍCIE DA MUCOSA VESTIBULAR	DESVIO MAJOR SEM DESVIO DESVIO MINOR				

## COPENHAGEN INDEX SCORE (CIS)

O CIS compreende a avaliação de seis (6) parâmetros, servindo-se mais uma vez da comparação com o dente de referência para a avaliação do resultado estético.

### 1. MORFOLOGIA DA COROA

Avaliada relativamente à anatomia, textura superficial, contorno, pontos de contato, altura e largura. O resultado **EXCELENTE** significa que não há qualquer diferença e **SUB-ÓTIMO** significa que dois dos parâmetros acima referidos não são cumpridos.



### 2. COR DA COROA

Avaliada relativamente ao matiz, croma, valor e translucidez

### 3. SIMETRIA/HARMONIA

Avaliada relativamente à linha média e longo eixo do dente.

### 4. DESCOLORAÇÃO DA MUCOSA

O resultado **SUB-ÓTIMO** significa que há uma coloração ligeira, ao passo que o **MODERADO** já se apresenta com uma coloração notória. **INSATISFATÓRIO** refere-se às situações de visibilidade do pilar.

### 5. PAPILA DISTAL

**ESTÉTICO** – papila preenche o espaço interproximal

**SUB-ÓTIMO** – papila preenche pelo menos metade do espaço interproximal

**MODERADO** – papila preenche menos de metade do espaço interproximal

**INSATISFATÓRIO** – ausência de papila

### 6. PAPILA MESIAL

**ESTÉTICO** – papila preenche o espaço interproximal

**SUB-ÓTIMO** – papila preenche pelo menos metade do espaço interproximal

**MODERADO** – papila preenche menos de metade do espaço interproximal

**INSATISFATÓRIO** – ausência de papila

A avaliação deve ser feita, consoante considere o resultado **EXCELENTE**, **SUB-ÓTIMO**, **MODERADO** ou **INSATISFATÓRIO**.

MORFOLOGIA DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
COR DA COROA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
SIMETRIA/HARMONIA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
DESCOLORAÇÃO DA MUCOSA	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
PAPILA DISTAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
PAPILA MESIAL	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO

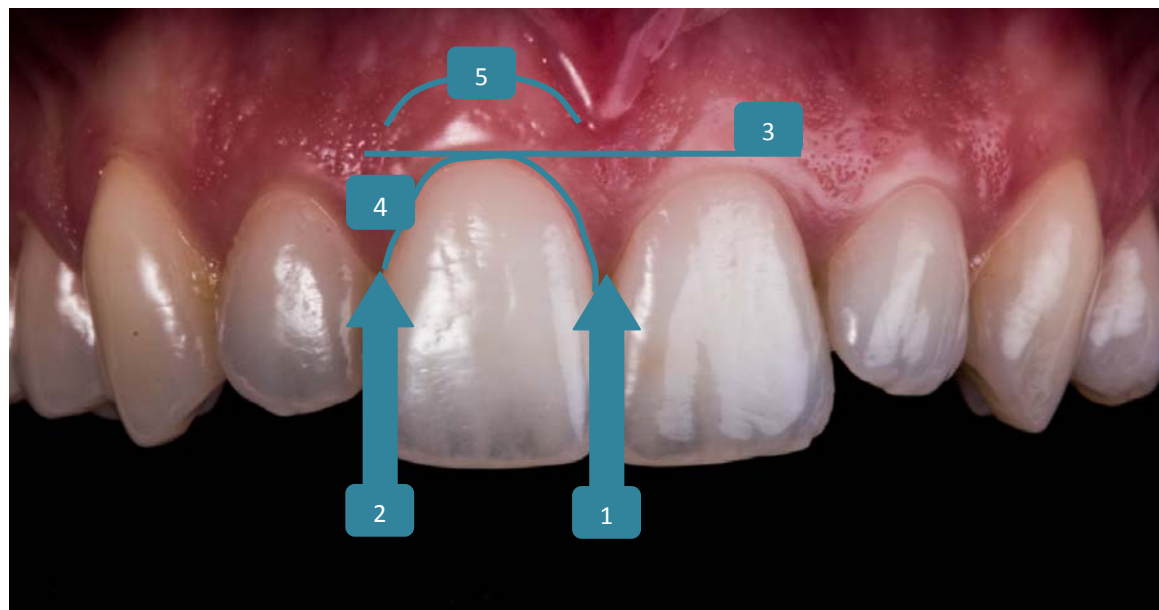
## **COMO UTILIZAR AS FOTOGRAFIAS?**

Todas as fotografias encontram-se numeradas na sua parte superior desde o número um (1) ao dezasseis (16). Este número é identificativo de cada caso, visto que para cada um existem pelo menos duas fotografias, a partir das quais pode e deve efetuar a avaliação do resultado estético solicitado.

Os dentes que correspondem aos implantes estão indicados por meio de setas.

Visualize as fotografias com o mesmo número identificativo em simultâneo.

## PINK ESTHETIC SCORE (PES) e WHITE ESTHETIC SCORE (WES)



### PES (APRESENTADO NA FIGURA)

1. PAPILA MESIAL
2. PAPILA DISTAL
3. NÍVEL DOS TECIDOS MOLES
4. CONTORNO DOS TECIDOS MOLES
5. DEFICIÊNCIA DO PROCESSO ALVEOLAR/ COLORAÇÃO E TEXTURA DOS TECIDOS MOLES

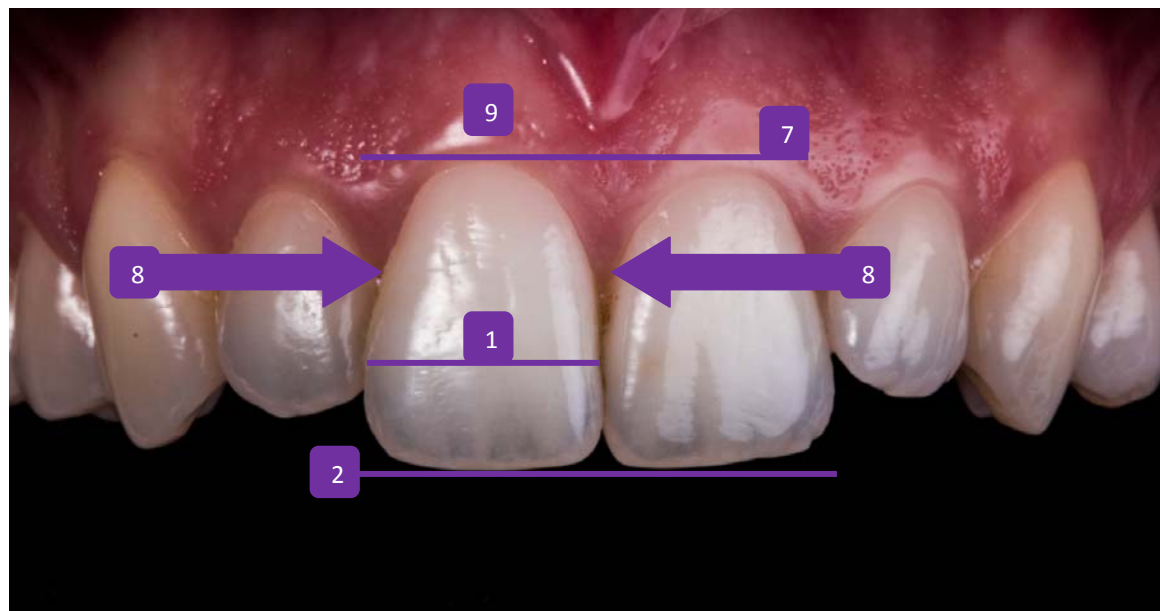
### WES

1. FORMA DO DENTE
2. VOLUME DO DENTE
3. COR (MATIZ/CROMA)
4. TEXTURA SUPERFICIAL
5. TRANSLUCIDEZ

### COMO PREENCHER A TABELA

PAPILA MESIAL			
PAPILA DISTAL			
RESTANTES ITENS	DISCREPÂNCIA MAJOR	DISCREPÂNCIA MINOR	SEM DISCREPÂNCIA

## IMPLANT CROWN AESTHETIC INDEX (ICAI)



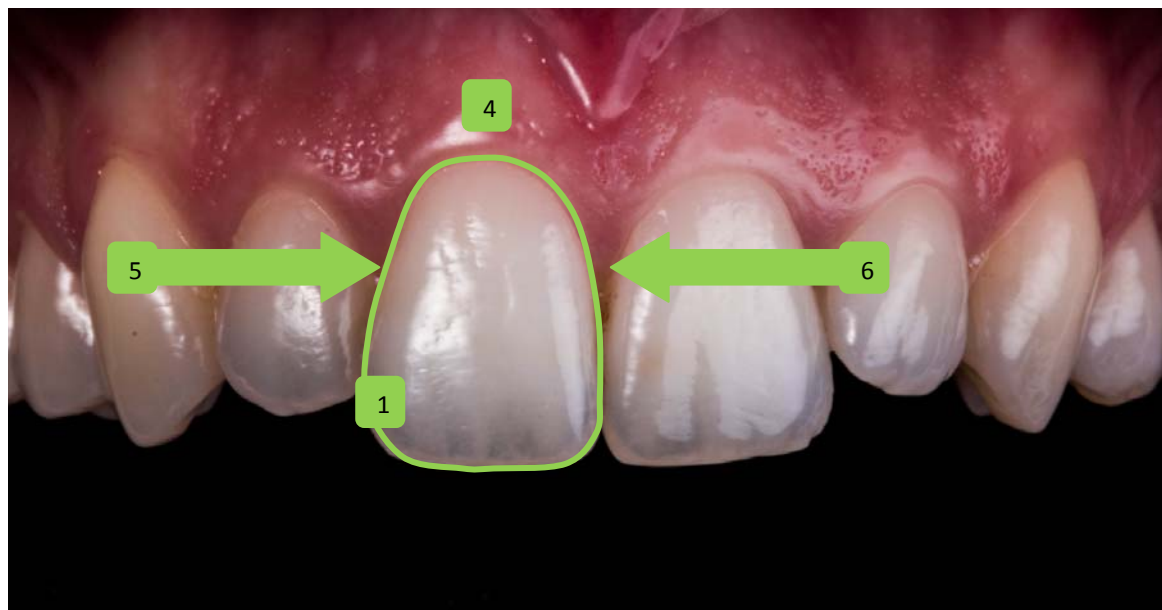
### ICAI

1. DIMENSÃO MESIODISTAL DA COROA
2. POSIÇÃO DO BORDO INCISAL DA COROA
3. CONVEXIDADE VESTIBULAR DA COROA (*FOTOGRAFIA OCLUSAL*)
4. CONTORNO VESTIBULAR DA SUPERFÍCIE DA MUCOSA (*FOTOGRAFIA OCLUSAL*)
5. COR E TRANSLUCIDEZ DA COROA
6. SUPERFÍCIE DA COROA (TEXTURA)
7. POSIÇÃO DA MARGEM VESTIBULAR DA MUCOSA INTERIMPLANTAR
8. POSIÇÃO DA MUCOSA INTERDENTÁRIA
9. COR E SUPERFÍCIE DA MUCOSA VESTIBULAR

### COMO PREENCHER A TABELA

ITENS 1-4	MUITO AUMENTADA	AUMENTADA	SEM DESVIO	DIMINUÍDA	MUITO DIMINUÍDA
ITENS 5-9		DESVIO MAJOR	SEM DESVIO	DESVIO MINOR	

## COPENHAGEN INDEX SCORE (CIS)



### CIS

1. MORFOLOGIA DA COROA
2. COR DA COROA
3. SIMETRIA/HARMONIA
4. DESCOLORAÇÃO DA MUCOSA
5. PAPILA DISTAL
6. PAPILA MESIAL

### COMO PREENCHER A TABELA

TODOS OS ITENS	EXCELENTE	SUB-ÓTIMO	MODERADO	INSATISFATÓRIO
----------------	-----------	-----------	----------	----------------

