



Communication of Aesthetic Data between Dentists and Laboratory Technicians in Fixed Prosthesis: A Study within Prosthetic Dental Technicians in Casablanca

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Abstract

Statement of Problem: Optimizing the aesthetic result of fixed prosthesis requires clear and fluid communication involving 3 partners: practitioner, patient and laboratory technician. **Purpose:** The objective of this survey was to determine the use of communication of aesthetic data (shape, dimension, color, etc.) between the dentist and the laboratory technician to improve the aesthetic result. **Material and Methods:** A descriptive cross-sectional study was conducted among 94 dental technicians in Casablanca, Morocco. **Results:** 30.09% of dentists had often reported to the laboratory technician the patient's expectations in aesthetic restoration to produce prostheses that matched patient aesthetic requests. Dentists mainly used temporary restorative dental impressions (66.6%) and photographs with temporary prostheses (55.3%) for transferring the dimensions and shapes of crowns to the laboratory. 75.5% of dentists always used shade guide and 53.2% of dental technicians rarely made visual assessments of the patient for shade matching. **Conclusion:** The communication of aesthetic data between the dentist and the laboratory technician involves efforts from both parties for the effective use of communication tools and investment in advanced digital devices for better management of patients' aesthetic requests.

Subject Areas

Communication, Fixed Dental Prosthesis

Keywords

Communication, Dental Technician, Fixed Dental Prosthesis, Dentist, Esthetic Data, Morocco

1. Introduction

Optimizing the aesthetic result of fixed prosthesis requires clear and fluid communication involving three partners: practitioner, patient and laboratory technician throughout the prosthetic chain.

The aesthetic expectations expressed by the patient are received by the dentist who has different means and techniques to transmit them to the dental technician. The increasing aesthetic requirements of patients impose a more frequent use of ceramic restorations. Dental ceramics are increasingly finding their way into today's dentistry. [1] Alongside the functional data, the aesthetic data allows the laboratory technician to manufacture the prostheses according to the recommendations of the dentist [2].

The quality of prosthetic care involves many aspects, including the quality of communication of aesthetic data between the dentist and the laboratory technician. Studies [3]-[9] have revealed a lack of information regarding aesthetic data (e.g. communication of shade especially for the anterior sector).

The digitalization and introduction of new technologies in the prosthesis laboratory and dental practices as well as the introduction of new dental materials allow for better patient care. The digital workflow ensures adequate precision in orienting a non-rigid connector to facilitate an aligned path to manage tilted abutments (when orthodontic treatment is not possible). It is an aesthetically pleasing alternative as well. [10]

The aim of this survey carried out in Morocco was to highlight the use of means of communication of aesthetic data (shape, dimension, color, etc.) between the dentist and the laboratory technician to improve the aesthetic integration of new fixed prostheses into the oral environment.

2. Materials and Methods

A descriptive cross-sectional study was conducted among dental technicians in Casablanca, Morocco between 25th September 2023 and 28th November 2023.

The sample size studied was 94 dental technicians practicing in private dental laboratories in Casablanca.

Inclusion criteria

- Private dental laboratories producing fixed prostheses
- Qualified prosthetists (state or private diplomas)
- The laboratories which agreed to participate in the study

Exclusion criteria:

Prosthetists practicing illegally.

Exclusive removable prosthesis laboratory.

Data collection used an anonymous self-administered questionnaire in French. The questionnaire is a self-designed one and includes specific aesthetic data on fixed prostheses such as crown shapes and dimensions, methods of communicating color as shade guide and electronic shade taking devices, diagnostic wax, and tooth preparation guide.

The questionnaire was distributed directly at the dental laboratory office. The questions were pilot-tested in 6 private dental laboratories by laboratory technicians.

The laboratories were selected randomly according to the indications on Google Maps or on some websites (Télécontact, PagesMaroc, Maroc Annuaire) as well as on the indications of some dentists or dental technicians.

3. Results

The sample of dental technicians in our study was composed of 62.8% men and 37.2% of them were aged between 35 and 49 years old.

Private school graduates accounted for 55.3% and 38.3% had more than 15 years experience.

The results of this study can be found in the following tables (**Tables 1-3**).

4. Discussion

The lack of information on aesthetic data can be justified by incomplete training of future dentists or that some practitioners consider some information to be more important than others [3].

Dentists and dental technicians take during their initial training courses on data communication necessary to carry out prosthetic work.

Regarding the guide for manufacturing the definitive prosthesis, 53% of the laboratory technicians stated that dentists often provided them with a guide for making the definitive prosthesis (diagnostic wax, tooth preparation guide, dental temporary prosthesis impression) (**Table 3**).

Table 1. Communication of crown shapes and dimensions.

Variable	%
Dental impressions of temporary restorations	66.0
Diagnostic waxes	47.9
Written instructions	24.5
Drawing	12.8
Photographs with the temporary prosthesis	55.3
Old photographs of the patient before edentulism	54.3
Other ways	3.2

Table 2. Methods of communicating color.

Variable	%
Visual assessment methods (shade guide...)	58.5
Electronic shade taking devices	8.5
Both methods	33

Table 3. Communication of other aesthetic data.

Variable	%
Communication of a guide to manufacture the definitive prosthesis (diagnostic wax, tooth preparation guide, etc.)	
Always	21.3
Often	53.2
Rarely	20.2
Never	5.3
Indication by dentists of the shade:	
Using shade guide:	
Always	75.5
Often	19.1
Rarely	4.3
Never	1.1
Using other tooth characteristics (texture, shine, translucency):	
Always	13.8
Often	54.3
Rarely	25.5
Never	6.4
Visual assessment of the patient by the dental technician for shade matching:	
Always	3.2
Often	21.3
Rarely	53.2
Never	22.3

However, a study conducted in Ireland showed that laboratory technicians did not receive a guide in 68% of cases [5].

The creation of temporary restorations follows the same mechanical, biological, or aesthetic principles as the definitive prosthesis. It is an essential communication tool in the prosthetic project allowing the patient to visualize and appreciate their future prosthesis and to inform the clinician about possible modifications which will be transferred to the laboratory so that the final prosthesis is the exact replica of the temporary prosthesis differing only in the material used.

4.1. Communication Crown Shape and Dimensions

To transfer the shapes and dimensions of the crowns to the laboratory, the dentists mainly used the impressions of the provisional restorations 66% followed by photographs with the dental provisional prosthesis in the mouth (55%) then

the old photographs before edentulism or dental disrepair (54.3%). (**Table 1**)

In the United Kingdom, written instructions were the main means of transferring crown dimensions to the laboratory (30%) followed by digital photography (24%) then drawings (15%). [5]

4.2. Color Communication

To communicate the color to the laboratory, dentists mainly used subjective visual assessment methods (shade guide) in 58.5% of cases and objective instrumental methods (digital reports) in 8.5% of cases. Both methods are used in 33% of cases. (**Table 2**) These results reflect the efforts of dental practices and prosthesis laboratories to evolve their practice by investing in technology and digital tools for better color communication of fixed prosthesis.

4.3. Communication of Other Aesthetic Data

4.3.1. Additional Data When Choosing the Shade

- Using shade guide

Dentists always indicated the shade guide used according to 75.5% of dental technicians (**Table 3**). Likewise, more than half of the laboratories studied in Saudi Arabia confirmed that the shade guide was indicated by more than 75% of dentists [11].

However, a study in the United States showed that 84% of the forms received did not specify the shade guide used [3].

In the United Kingdom, 81% of laboratories had rarely received photographs of patients with the shade guide used [4].

4.3.2. Other Tooth Characteristics

When communicating the color, other characteristics of the tooth (texture, shine, translucency) were often provided to the laboratory technician at a rate of 54.3%. (**Table 3**)

Indeed, the reproduction of the natural tooth is one of the most complex steps to accomplish and requires the skill and expertise of the ceramist to refer to all the individual characteristics linked to the patient.

4.3.3. Visual Assessment of the Patient by the Dental Technician for Shade Matching

In our study, 53.3% of dental technicians rarely saw patients in the laboratory for shade matching. (**Table 3**)

A study in the United Kingdom reported that 9% of laboratory technicians took the patient's advice on shade selection. [12]

According to a study carried out in Dakar, 3.3% of dentists delegated shade taking to the laboratory technician. However, dental laboratories rarely had the means to choose the shade in the patient's mouth in minimal hygiene conditions (hand disinfection, gloves, masks) [13].

One of the limitations of our research is of questionnaire did not address the type of material used for the fixed prosthesis (porcelain-fused to metal prosthesis

or all-ceramic) and did not specify whether the choice of material and type of ceramic was made by the dentist or the dental technician. The pontic design of the prosthesis is necessary to take in account for an aesthetic result. [8]

Also, the study took place in Casablanca which is the economic capital of Morocco. Indeed, the demographic characteristics of the sample are specific to Casablanca and therefore do not reflect the situation in Morocco.

5. Conclusion

The communication of aesthetic data between the dentist and the laboratory technician involves efforts of both partners for the effective use of communication devices and for the investment in advanced digital tools. The final objective is better management of the patient's aesthetic requests.

Conflicts of Interest

The authors declare no conflicts of interest.

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