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# Failures in dental prosthesis: dentists perception of the involved legal aspects

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**ABSTRACT.** This aim of this study was to verify the level of knowledge of prosthodontics specialists from the city of Porto Alegre, Rio Grande do Sul State, concerning the failures of prosthetic works, and to provide a reflection on the type of responsibility assumed by the prosthodontist during the dental treatment. This was a descriptive cross-sectional study with a non-probabilistic sample, conducted through questionnaires with closed and open questions. The data was analyzed using the Fisher's Exact Test (p value < or = 0.005). The sample consisted of 143 questionnaires. The statistical analysis evidenced that the dentists with up to 15 years of professional practice assign the responsibility of failures most often to the laboratory (p = 0.001) and to the patient (p = 0.021), but over the years this trend is reversed. The prosthodontists included in the study proved to have an adequate knowledge of issues that pervade the failures in the prosthodontics specialty. In relation to the parameters of the professional responsibility, it is necessary to consider the type of duty assumed by the prosthodontist as for the responsibility of means.

**Keywords:** forensic dentistry, clinical record, legal liability, professional practice, expert testimony.

## Insucessos em prótese dental: percepção dos cirurgiões-dentistas quanto aos aspectos odontolegais envolvidos

**RESUMO.** O objetivo deste estudo foi verificar o grau de conhecimento do CD especialista em prótese dentária da cidade de Porto Alegre/RS sobre aspectos relacionados aos insucessos de trabalhos protéticos, bem como propor uma reflexão sobre o tipo de obrigação assumida pelos protesistas durante o tratamento odontológico. Tratou-se de um estudo transversal descritivo, com amostra não probabilística de indivíduos realizada por meio de questionários, nos quais constavam questões fechadas e abertas. A análise dos dados foi realizada utilizando-se o Teste Exato de Fischer (sendo p < ou = 0,005). A amostra foi composta de 143 questionários. O estudo estatístico mostrou quando interpretado em relação ao tempo de exercício profissional, que até os primeiros 15 anos de formado o profissional tem o entendimento de que os erros advêm mais frequentemente do laboratório (p = 0,001) e dos pacientes (p = 0,021), invertendo esta tendência com o passar dos anos. Os protesistas componentes da amostra mostraram ter um conhecimento adequado das questões relacionadas aos aspectos que permeiam os insucessos na especialidade de prótese. Ao considerarmos os parâmetros da responsabilidade profissional, deve-se considerar o tipo de obrigação assumida pelos protesistas como responsabilidade de meio.

**Palavras-chave:** odontologia legal, ficha clínica, responsabilidade legal, prática profissional, prova pericial.

## Introduction

The knowledge of the dentist about the longevity of the prosthetic work is directly related to the criteria of success or failure of the treatment, which apparently does not consider the patient satisfaction (FRANK et al., 2000).

Since the creation of the Consumer Protection Code in 1990, complemented by the Civil Code from 2002, the number of litigations against dentists in Brazil has grown because the population is exercising their right of charging for something not performed properly (SILVA et al., 2011).

In fact, the dentist should always be aware in order to minimize the errors during the prosthetic treatment, and to the responsibilities inherent to each one involved in the treatment: the dentist, the dental technician and the patient (FRANCESQUINI JR. et al., 2009).

Researches have shown that prosthesis was the most frequent specialty in litigations in the ethical scope and on the legal sphere (civil law) (FRANÇA, 1995; RAMOS, 2000), being among those that led to the highest number of lawsuits (COSTA-E-SILVA; ZIMMERMANN, 2006; MODOLO et al., 1999;

SILVA et al., 2011). Discussions on the legal aspects related to the durability and efficiency of the dentures and on the responsibility for professional errors are very current and deserve attention by the professionals and researchers. Therefore, this research aimed to verify the level of knowledge of the dentist specialized in prosthesis from the city of Porto Alegre (Rio Grande do Sul State) concerning the aspects related to the failures of prosthetic works, as well as to provide a reflection on the type of responsibility assumed by the prosthodontist during the dental treatment.

## Material and methods

This is a descriptive cross-sectional study with a non-probabilistic sample of individuals, which was submitted to the Research Ethics Committee from the Dentistry College of Piracicaba, São Paulo State, (UNICAMP - protocol 118/2007). After approval, the research was performed through questionnaires provided together with the respective Consent Form to 222 prosthodontists, in the city of Porto Alegre, Rio Grande do Sul State. The questionnaires were personally delivered by the researcher or his auxiliary and/or sent by mail, and collected after 3 weeks.

The names of the dentists and respective professional addresses were obtained at the Regional Council of Dentistry (CRO-RS). The questionnaires contained closed questions and two open questions. The data was analyzed through the Fisher's exact test, using $p < \text{or} = 0.005$ significance level.

## Results and discussion

One hundred eighty four questionnaires have been sent back. Among these, 37 were completely blank, three came from dentists that had moved and one was from a dentist considered unknown by the post office. Therefore, the research was based on 143 answered questionnaires (n = 143), 64.4% of the number of prosthodontists enrolled on the CRO at that time.

Concerning the characteristics of the sample, 53.8% of the participants were female (n = 77) (1.4% did not answer this question) and, regarding the age group and length of professional experience, predominated respectively the age range between 31 and 40 years old, and the between 16 and 20 years since graduation.

When asked if they have attended forensic dentistry classes, 47.6% (n = 68) of the participants declared to not have received legal orientation; around 21.7% (n = 31) had classes about this subject during graduation studies, 18.2% (n = 26) had this kind of orientation during other studies besides graduation, 11.9% (n = 17) did not answer this question and 0.7% (1 dentist) was specialized in forensic dentistry and prosthesis.

Specifically, the dentists were asked about the responsible for failures during the treatment with fixed prostheses and removable prostheses (Figure 1), as well as the variables responsible for the treatment failure according to each part involved (Figure 2).

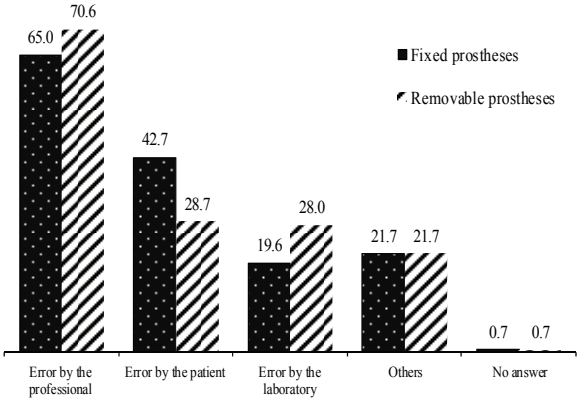


**Figure 1.** Perception of the origin of the error in each kind of prostheses.

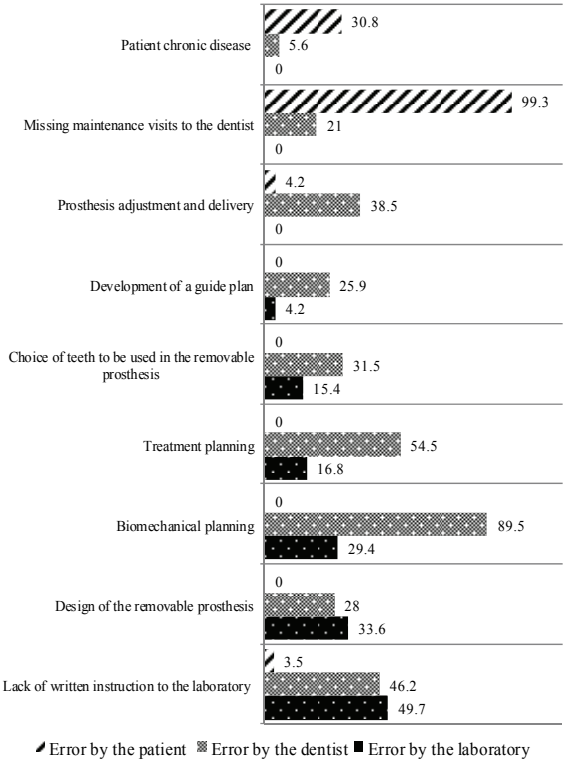


**Figure 2.** Perception of the variables involved with the failures.

Concerning the laboratory mistakes, for 49.7% of the participants the lack of written instructions is responsible for the treatment failure. Regarding the variables related to the patients, 99.3% of the professional listed the lack of hygiene of the prosthesis as the most important aspect in the failure (Figure 2). As for the dentist, errors in

biomechanical and treatment planning (89.5% and 54.5%, respectively) and lack of written instruction to the laboratory (46.2%) were the most frequent causes for the treatment failure. Using the results from the statistical Fisher's Exact Test, the Tables 1 and 2 were elaborated.

**Table 1.** Comparison by age.

| Variable | Category | Age | | | | | p |
|---|---|---|---|---|---|---|---|
| | | 20-30 | 31- 40 | 41- 50 | 51-60 | > 60 | |
| Professional error for cases of fixed prostheses | Yes | 40.0 | 73.8 | 69.4 | 72.2 | 100.0 | 0.044* |
| | No | 60.0 | 26.2 | 30.6 | 27.8 | | |

*p < or = 0.005.

**Table 2.** Comparison by years of professional experience.

| Variable | Category | Years of professional experience | | | | | | p |
|---|---|---|---|---|---|---|---|---|
| | | 0-5 | 6-10 | 11-15 | 16-20 | 21-25 | > 25 | |
| Laboratory error for cases of fixed prostheses | Yes | 42.9 | 3.7 | 5.6 | 32.1 | 38.5 | 9.5 | 0.001* |
| | No | 57.1 | 96.3 | 94.4 | 67.9 | 61.5 | 90.5 | |
| Patient error for cases of fixed prostheses | Yes | 21.4 | 37.0 | 38.9 | 53.6 | 84.6 | 42.9 | 0.021* |
| | No | 78.6 | 63.0 | 61.1 | 46.4 | 15.4 | 57.1 | |

*p < or = 0.005.

This study examined aspects related to the failures in the prosthodontics specialty, considering the perception of professionals. This is a valid concern, even though the dentistry based on evidences can be used to provide a base for clinical decisions, once the process that occurs between the dental surgeon and the patient does not contain norms that can be generally and unconditionally applied to every case. The individual characteristics of each patient must be taken into consideration (LELES; FREIRE, 2005), showing, whenever in civil litigation, the importance of having an expert assessment that encompasses all the people involved.

It is important to notice that 18.4% of the interviewees did not want to participate, and sent the questionnaire back in blank. Along with the dentists that had moved out of the city or could not be found by the post office, the research reached a mark of 35.6% of non-answered questionnaires.

Through the results found in the sample, it was possible to verify a balance between the genders, with a slight predominance of women (53.8%). This fact differs from other studies, which usually show a male predominance in prosthodontics specialty (PARANHOS et al., 2009).

Regarding the age, the distribution was uniform, ranging among three categories in about 10% (from 20 to 30 years; from 51 to 60; and 61 or older), with a concentration between 31 to 50 years old (54.6%). It is noteworthy that these data show a high demand for specialization immediately after the graduation, explaining 17.5% of the total of specialists at the age range of 20 to 30 years old.

Concerning the knowledge of forensic dentistry, almost half of the respondents did not have this subject during graduation, given the limitation of the universities curriculum, once around one fifth of the sample declared to have attended classes on this subject during graduation. Faced with this situation, the Federal Council of Dentistry (CFO) recommended the specialization courses to provide a minimum of 30 hours in classes about Ethics and Dental Law (CFO, 2005).

Regarding the failures occurred with fixed prostheses, the prosthodontics respondents consider the professional as the major responsible (65%), although all the people involved had been mentioned: the patient (42.7%) and the laboratory (19.6%), pointing out that each one have their own part of responsibility (FRANCESQUINI JR. et al., 2009; JOHNSON; STRATTON, 1988).

After the statistical validation between this data and the age, the results indicated that the respondents in the age group between 20 to 30 years old ($p = 0.044$) were more likely to consider the professionals as responsible for the failures in the works; instead, they attributed the failures to the laboratory and/or the patient. Also, the statistical analysis related to the time of professional practice showed that the dentists with up to 15 years of work experience understand that the responsible for failures are, most often, the laboratory ($p = 0.001$) and the patient ($p = 0.021$), but their understanding changes with advancing time of practice.

In this way, patients may be somewhat responsible for failures, regarding the oral hygiene, once that plaques on the oral tissue can cause countless problems. An example is the relationship between the oral hygiene and the incidence of pulmonary infections in hospitalized patients (DE PAULA; SILVA, 2004; MORAIS et al., 2006). Moreover, as factors associated with the patient, smoking and biological evolution (or involution) of the organs of the stomatognathic system can also influence the problem.

After prosthesis adjustments and delivery, the patient becomes also responsible for the work, especially regarding the cleaning and use care, as well as the follow-up visits to the dentist surgeon. Considering the risk factors, the failure of a prosthetic treatment cannot belong only to the dentist. The higher the risk, the lower possibility to assign the result to the dentist (GIOSTRI, 2009).

Therefore, even the work performed according to the standard techniques of quality on dentistry, with attention, dedication and the best materials available to

this goal, esthetic changes may occur depending on the habits of the patient as highly pigmented food, smoking and insufficient oral hygiene. In these cases the professional is not responsible for the alterations, since it was caused exclusively by the patient (FRANCESQUINI JR. et al., 2009).

The patients are ever more searching for treatment aiming at aesthetic results, which also presents risk factors. In this situation, the failure of a prosthetic treatment does not depend only on the dentist; thus the dentist should always provide a contract specifying the obligation of means, emphasizing the need for dental care to the patient, instead of promising cosmetic results (GIOSTRI, 2009; KATO et al., 2008).

Regarding the most frequent structural alterations in the different kinds of prosthesis, the analysis focusing on the fixed prosthesis showed that the failures can be classified into intrinsic and extrinsic to the pillar tooth (DELL'ACQUA, 1986). The available longitudinal studies (between 18 and 23 years of clinical evaluation) show that the major errors in fixed prosthesis are related with: the endodontic treatments, the terminal distal position of the device, the tooth place on the jaw, and advanced loss of marginal bone (PALMQVIST; SÖDERFIELDT, 1994).

A research on the most frequent failures on the tooth preparation for fixed prosthesis were: inadequate reduction of walls, severe reduction of tissue, excessive conicity, inadequate axis, unidentifiable cervical limit, retentions in the axial wall and protruding angles (CHRISTENSEN, 2007).

And for the adhesive fixed work, the main imperfections were related to the length of the work (number of abutments), the location of the work whereby the anterior prostheses had better success than the adjusted on the posterior elements, and also to the failure in the evaluation of the periodontal and occlusal conditions and of the parafunctional habits. The factors that can increase the longevity of the works are: retentive features such as supports, proximal channels and grooves and the use of an alloy of Nickel-Chromium and Chromium-Cobalt (CREUGERS et al., 1997).

For the removable devices, the main errors were related to all the people involved in the work: the patient, the dentist surgeon, and the laboratory (JOHNSON; STRATTON, 1988). In a survey of 10 years, it was reported as the most relevant errors, the recurrence of caries, periodontal alterations and the fracture of the prosthesis (BERGMAN et al., 1982).

Considering the philosophy of preservation of oral tissues, the greatest failures of the removable partial dentures occurs with a loss of the remaining hard and soft tissues, either by a poor oral hygiene or by a missing return of the patient. This type of failure is considered 'personal'. Another kind of failure in removable prosthesis is the lack of professional skill to: 1) develop a treatment plan, 2) perform the "buccal preparation" or 3) correctly prescribe the laboratorial services (JOHNSON; STRATTON, 1988).

In relation to the kind of failure and its responsible, the participants answered that the prosthodontist was responsible for the failure in the stages of installation (fixed or removable) (38.5%), treatment plan (54.5%) and planning (89.5%), which shows that the respondents are aware of their responsibilities to the people involved: the patient and laboratory (BRASIL, 1990, 2002; FRANÇA, 1995; CFO, 2003, 2005; COSTA-E-SILVA; ZIMMERMANN, 2006; MODOLO et al., 1999; RAMOS, 2000; SILVA, 2009).

As for the laboratory errors, 29.4% of the respondents mentioned the dental technician as responsible for the planning issues, 16.8% for the treatment plan and 15.4% for the choice of teeth to be used in the removable prosthesis. These activities are exclusive of the dentist surgeon, as established in the norms of the profession (CFO, 2005; JOHNSON; STRATTON, 1988).

The respondents correctly identified the failures related to the patients: lack of hygiene (99.3%), chronic disease (30.8%), installation (4.2%), and lack of written instruction (3.5%), also observed in other studies (HUNG et al., 2003; JOHNSON; STRATTON, 1988; TURNER et al., 2008). This fact may have occurred owing the high level of capacity of the professional respondents, either by knowledge acquired in graduation (86%), in specialization (84%) or other courses (57.3%).

## Conclusion

The prosthodontists included in the study showed to have an adequate knowledge of the issues related to the failures in prosthesis specialty. Considering the interpretation of the current legislation, the responsibilities inherent to each person involved (the professional, the laboratory, and the patient) and the excluding parameters of the professional responsibility, it is necessary to consider the type of duty assumed by the prosthodontist as for the responsibility of means.

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