The teaching of minimally invasive dentistry: an experience report

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ABSTRACT

For many years, teaching dentistry has been based solely on the reproduction of restorative techniques, students being motivated merely to perform procedures without developing reflective skills, which are as important as the techniques themselves. This experience report discusses a clinical case and problematizes the teaching of minimally invasive dentistry. Discussions were held and the formulation of tables and charts was performed by the students, as well as the compilation of a practical guide to help with the choice of restorative treatment. The activities were considered productive and complementary in solving lingering doubts. It was concluded that the use of the active methodology reported in knowledge building was an important strategy for the creation of learning situations in the approach to minimally invasive dentistry. Meaningful learning from an ongoing clinical case proved to be an important teaching strategy.


1 INTRODUCTION

Dental caries is the most prevalent problem in the oral cavity1-3, presenting multifactorial etiology4. Behavioral, social and economic factors are important components in the development of the disease, which can be arrested at any time by removing the etiological factors, thus restoring health. In this way, the dentist must know and be able to identify the components of the activity of the disease in order to make the best treatment decision, which, in many circumstances, is not restorative5,6.
Several studies have shown that clinical management varies among dentists in different countries, demonstrating the highly curative and interventionist profile of professionals, who tend to intervene in initial caries lesions and in restorations with marginal staining, without there being, in fact, a need to do so. Therefore, teaching minimally invasive dentistry presents a very interesting context in the problematization of technical dentistry. Clinical cases can be a trigger for discussion and used as a strategy to work reflective skills and abilities such as critical thinking. In addition, the questioning of cases can be a pedagogical instrument to develop the clinical reasoning of future professionals, who must be able to act upon the etiological agents of the disease and not only on the reproduction of procedures. The focus should not only be on the traditional teaching of certain restorative techniques, but also provide an environment capable of generating discussion that ensures future professionals will avoid performing unnecessary procedures.

In view of the importance of discussing topics related to minimally invasive dentistry and considering that the studies published in this context are basically restricted to teaching and training in the detection of carious lesions and simulation of the texture of carious lesions for preclinical training, the present study aimed to present an experience report that used the discussion of a clinical case to problematize the teaching of minimally invasive dentistry.

2 EXPERIENCE REPORT

A 22-year-old female patient sought dental care at the Faculty of Dentistry of the Federal University of Pelotas (FO-UFPel), at the Clínica Odontológica I unit. At reception, the main complaint noted was the need to perform several restorations. Further information was provided at reception and then clinical and radiographic examinations were performed, the findings of which are shown in chart 1.

### Chart 1. Clinical findings after diagnostic tests

<table>
<thead>
<tr>
<th></th>
<th>Supragingival periodontal examinations</th>
<th>Subgingival periodontal examinations</th>
<th>Dental Fluorosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible Plate Index:</td>
<td>8.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gingival Bleeding Index:</td>
<td>13.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaque Retentive Factor:</td>
<td>16.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probing attachment:</td>
<td>All &lt; 4 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding on probing:</td>
<td>71.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dean index:</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ICDAS (International Caries Detection and Assessment System)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score 2 - inactive caries lesions with visible opacity in the presence of humidity</td>
<td>Teeth numbers 15, 17, 25, 27, 33, 34, 36, 43, 44, 45 and 47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score 3 – enamel cavity</td>
<td>Teeth numbers 25, 26, 36 and 46</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Restorations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite resin restorations</td>
<td>Occlusal faces of teeth numbers 16, 26 and 46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The diagnosis was mild, plaque-induced gingivitis and caries disease was absent. The
The teaching of minimally invasive dentistry: an experience report

The patient was instructed to perform oral hygiene, restorative treatment being contraindicated. The patient reported that she had made an appointment at a private dental clinic and that the professional concluded that the stains on her teeth were caries lesions and that restorative treatment was necessary. In addition, the professional insisted that the disease would progress and, if not treated with an operative intervention, could result in the need for endodontic treatment. In addition, it could eventually lead to the loss of teeth. The treatment plan and costing were presented by the professional.

Due to the high cost of performing all the restorations, she reported that only three teeth were operated on, the services of FO-UFPeI being sought subsequently. After clarifying the patient’s doubts, she was instructed and warned of the risks of dental overtreatment and that inactive caries lesions carry a low risk of reemerging and progressing. She was also instructed to attend regular consultations to monitor inactive lesions and control gingivitis.

In view of the complex range of nuances in the present clinical case, a group discussion was held with the other students, who initially presented several contrasting points of view on the possibilities of clinical management for the case in question. Several students tended to recommend restorative treatment. In this context, considering that the indication of restorative treatment does not present specific criteria and that it can vary (within certain limits), students were asked to devise, based on the literature, a table showing the treatment possibilities for dental caries, classifying them according to the intervention target. The construction of a schematic chart was also requested to guide the decision of restorative treatment based on a philosophy of minimal restorative intervention.

The students presented the two requested tasks, which were discussed with the teachers.

At this point, the students continued to have difficulty in deciding whether restoration should or should not be indicated, mainly due to the impossibility of standardizing or objectively determining the extent of carious lesions based on radiographic images, coupled with the various possibilities of materials and techniques. In this way, an agreement was reached with the students to compose a text based on the current scientific literature, focusing on a discussion about the restorative treatment decision, all of them being based on the ICDAS (International Caries Detection and Assessment System). This was carried out with the objective of compiling a practical guide for the choice of restorative treatment method.

The feedback was reported by the students to be productive and complementary in solving lingering doubts regarding the composition of the tables. Thus, the present case was important for problematizing the discussion of minimally invasive dentistry during practical activities, boosting reflective thinking, which is essential in the training of professionals capable of looking beyond the restorative technique, in other words, in the determinants of the health / disease process.

3 FINAL CONSIDERATIONS

The formulation of the treatment plan is one of the most important aspects of the dentist’s routine and the decision on restorative intervention must be based on scientific knowledge, as well as the determination of a correct, accurate diagnosis. However, establishing a correct diagnosis requires considerable knowledge regarding the determinants of disease, as well as a knowledge of the histopathology of caries and its manifestations in dental tissue, which might be considered complex for students who are
starting out on their clinical career. Thus, the use of clinical situations to problematize the subject and acquire a deeper understanding of the cognitive issues seems to be an interesting pedagogical strategy based on the philosophy of active learning.

For many years, the teaching of Dentistry was based solely on the reproduction of restorative techniques and the student was motivated merely to perform restorations with a high level of detail, but without reflecting on his actions\textsuperscript{24}. Currently, one of the fundamental characteristics of the profile of students is the ability for reflection. Thus, the teaching of Dentistry has moved towards less passivity for students, who should participate in moments of discussion\textsuperscript{16}. These moments are fundamental for the development or improvement of reflective skills.

The development of material based on scientific literature to assist in determining and subsequently applying the content in clinical situations, was an important teaching strategy that provided learning environments and fostered discussion based on scientific evidence obtained by the students. These approaches have always been mediated by teachers who have come to perform the role of tutors. In addition to the initially proposed questions, the students raised other issues that had not been initially considered by the teachers, such as the large number of dentists in Brazil\textsuperscript{25} and the possible reflection of this in the behavior of professionals and the commercialization of Dentistry. This discussion was based on a recent study investigating the job market for dentists\textsuperscript{25}. Thus, the students argued that professionals might be recommending unnecessary treatments for financial reasons, in addition to their lack of current information about minimally invasive dentistry.

It is concluded that the use of the active methodology reported in the construction of knowledge was an important strategy for the creation of learning situations in the approach of minimally invasive Dentistry. Significant learning from an ongoing clinical case proved to be an important teaching strategy.

RESUMO
O ensino da Odontologia minimamente invasiva: relato de experiência
Por muitos anos o ensino de Odontologia foi baseado apenas na reprodução de técnicas restauradoras e o estudante era motivado a apenas realizar procedimentos, sem desenvolver habilidades reflexivas, as quais são tão importantes quanto as técnicas. O presente relato de experiência discute um caso clínico como problematizador no ensino da Odontologia minimamente invasiva. Discussões e formulação de tabelas e quadros foram realizadas pelos estudantes, assim como a elaboração de um guia prático para auxiliar a escolha do tratamento restaurador. As atividades foram tidas como produtivas e complementares na resolução das dúvidas que ainda estavam pendentes. Conclui-se que a utilização da metodologia ativa relatada na construção de conhecimento foi uma importante estratégia para criar situações de aprendizado na abordagem da Odontologia minimamente invasiva. O aprendizado significativo advindo de um caso clínico em andamento se mostrou uma importante estratégia de ensino.


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