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Decision-Making in the Management of Fixed Prosthesis Cases Among Senior Year Dental Students Part II: At-Risk and Specific Patients

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Purpose: To assess the ability of senior year dental students to adapt the treatment plan based on specific patient conditions. **Materials and Methods:** A cross-sectional study involved a sample of 150 senior year students at the Faculty of Dentistry in Casablanca. The survey used a questionnaire with different clinical situations. Results: The most proposed solution for a patient with low financial means was to replace the missing teeth with a removable prosthesis (67.5%). For the diabetic patient, 29.1% of the students felt that the treatment plan should not be changed if the diabetes was well balanced. 25.6% of the students felt that the treating physician should be contacted to find out if the diabetes was indeed balanced. For the patient with Parkinson's disease, 19.7% felt that care should be performed under deep sedation or general anesthesia. In the case of a patient undergoing radiotherapy for cavum cancer with alcoholism and smoking, 23.9% of the students thought that implants should not be used because of the healing delay, but also because of the risk of osteoradionecrosis and peri-implantitis. 20.4% thought that the treatment should be carried out before the radiotherapy. **Conclusion:** Our investigation revealed the weakness of students at the end of their training to undertake precautions for specific clinical situations. Learning methods and ongoing student evaluation must be implemented to ensure better preparation of students for their professional careers.

Keywords: Dental students, therapeutic decision, at-risk and specific patients

I. Introduction

Standards in fixed prosthetics are of fundamental importance. To facilitate these processes, The British Society for Dental research (15), published guidelines in 2013 that address the demand for fixed prosthetic care. They include recommendations regarding the factors that contribute to the choice of a crown, bridge or implant, as well as their operative protocol, treatment objectives in conjunction with a prosthesis, the complete clinical examination, the choice of treatment plan and materials used, considerations and techniques for implants, and laboratory prescriptions.

These guidelines should not be considered prescriptive or didactic. It is clear that there will be circumstances, encountered in the management of the patient, where the "ideal" treatment will not be possible nor the optimal outcome.

The available scientific evidence often comes from studies that likely excluded the type of patients we often see in our practice and therefore are not generalizable to all clinical scenarios.

In an ideal evidence-based decision-making scenario, when a patient has a specific problem, the clinician should be able to propose a relevant solution based on the patient's unique condition, seeking an evidence-based plan that best fits the clinical situation, taking into account the patient's preferences and values and the practitioner's expertise. (7)

The purpose of this study is to assess the ability of trainees at the end of training to adapt the proposed treatment plan based on the unique features presented by the patient.

II. Materials and Methods

The questionnaire of the present study includes a clinical case divided into 5 sections:

The 1st situation is the real situation of the patient (photos, X-rays, and study models of the patient), for which the participants have already quoted the objectives and the treatment plan with its chronology.

The other 4 situations are fictitious situations for the same clinical case by introducing different factors:

1- Low socio-economic level
2- Insulin-dependent diabetes
3- Parkinson's disease (psychomotor problem)
4- Candidate for radiotherapy for cavum cancer + smoker and alcoholic

For each of these fictitious situations, the student will have to cite the possible changes to be made to the clinical solutions initially proposed in the first part of study.

The questionnaires were distributed to all students in their last year of the Faculty of Dentistry of Casablanca.

III. Results

117 students responded (62.4% female and 37.6% male).

After establishing the goals and treatment plan in our first study, participants cited changes that should be made to their proposals based on the situation presented:

Patient with low socioeconomic level:

The most proposed solution for a patient with low financial means was to replace the missing teeth with removable partial dentures (67.5%). Only 6.8% proposed a bridge to replace the missing teeth. 35% of the students felt that the implant solution or orthodontic treatment should not be used since it is expensive. (Tab 1)

Patient with low socio-economic level	Number	Percentage
removable partial dentures replacing missing teeth	79	67,5
Sealed bridge replacing missing teeth	8	6,8
Removal prosthesis+ core inlay on 27	12	10,3
No implants or orthodontic treatment	41	35

Table 1 :Patient with low socio-economic level

Patient with diabetes:

For the patient with diabetes, there is no consensus among students for the proposed solutions. The answers are more or less diversified. However, 29.1% of the students thought that the treatment plan should not be changed if the diabetes was balanced. 25.6% of the students thought that the attending physician should be contacted to find out if the diabetes was indeed balanced.

Antibiotic prophylaxis before endodontic treatment and scaling was proposed by 15.4% of students. The implant solution was avoided by 20.5% of the students. (Tab 2)

Diabetic patient	Number	Percentage
Antibiotic prophylaxis before endodontic treatment and scaling	18	15,4
Contact your doctor to find out if your diabetes is well controlled	30	25,6
If balanced diabetes, no change	34	29,1
Tests (glycated hemoglobin, fasting blood glucose)	15	12,8
Morning and short sessions	9	7,7
Patient should not fast	4	3,4
No multiple extractions in the session	2	1,7
Avoidance of endodontic treatment on multidigitated teeth	2	1,7
No implant	24	20,5
The student does not know the answer	1	0,9
conventional Bridge	19	16,2
removable partial dentures.	11	9,4
sedative premedication to limit stress	1	0,9

Table 2 : Diabetic patient

Parkinson's patient with psychomotor problem:

For the patient with Parkinson's disease: 17.9% of students felt that no change in the treatment plan was necessary. 19.7% felt that care should be performed under deep sedation if not general anesthesia. 17.1% felt that orthodontic treatment should be avoided in this case. 12% felt that it was necessary to have an adult around the patient to supervise the hygiene since the patient has a psychomotor problem. (Tab 3)

Patient with Parkinson's disease	Number	Percentage
Contact of a doctor treating the disease	6	5,1
Adult supervision for hygiene	14	12
Prescription electric brush for brushing	13	11,1
No implant (no surgery)	4	3,4
removable partial dentures.	14	12
Abstention	14	12
Care under sedation or general anesthesia	23	19,7
No change in treatment plan	21	17,9
The student does not know the answer	9	7,7
Reassurance of the patient and explanation of the treatment plan	5	4,3
No orthodontic treatment	20	17,1
No prosthesis (psychomotor problem)	4	3,4
Antibiotic prophylaxis before the procedure	1	0,9

Table 3: Patient with Parkinson's disease

Patient candidate for radiotherapy for cavum cancer + alcoholic and smoker :

23.9% of the students felt that implants should not be used because of delayed healing, but also because of the risk of osteoradionecrosis and peri-implantitis. 20.4% felt that treatment should be performed before radiotherapy. 17.9% felt that a removable prosthesis should be used until after radiation therapy. 10.3% felt that smoking and alcohol withdrawal should be performed, as well as monitoring of Transaminases and CBC for the alcoholic patient (2.6%). Tab 4

Patient candidate with radiotherapy	Number	Percentage
Contact the doctor treating the disease	11	9,4
Leaded gutter	10	8,5
Alcoholic: Monitor transaminases and CBC	3	2,6
No implants (no healing, osteoradionecrosis, risk of peri-implantitis)	28	23,9
smoking and alcohol cessation	12	10,3
No change in treatment plan	1	0,9
Abstention for radiotherapy	17	14,5
Antibiotic prophylaxis before the procedure	4	3,4
removable partial dentures	21	17,9
The student does not know the answer	8	6,8
Regular control	3	2,6
Bridge conventionnel	7	6
Extraction of teeth with poor prognosis	4	3,4
No orthodontique treatment	3	2,6
Care before or after radiotherapy	29	24,8

Table 4: Candidate patient for radiotherapy+alcoholic and smoker

IV. Discussion

Students presented a difficulty in correctly predicting the protocol to undertake for at-risk patients.

Patient with low socioeconomic level:

In our study, participants proposed the removable prosthesis to fit the treatment to low financial means and ruled out any expensive proposal. A similar study was conducted with final-year Bachelor of Dental Surgery students in India (6) in 2019 to assess the attitudes and practices of dental students in providing oral health care services to patients in underserved rural areas. In contrast to our study, 53.4% of dental students felt that the number of appointments required for patients should be minimized and dental services should be provided regardless of financial ability. We can infer that this is due to the fact that public hospitals in India offer free care to the poorest. In Morocco, there is a real barrier to access to care for patients. To remedy this situation, the inclusion

of patients in a dental insurance program leads to an improvement in access to care and a decrease in medical prescriptions induced by deprivation.

Similarly, the work done by Christensen G. (5), in 2017 in the United States found that for patients with minimal financial resources, the removable option is much more attractive among dentists, without specifying the rates. Further studies, targeting students, should be done to evaluate the prosthetic choices regarding the patient with low socioeconomic status.

Diabetic patient:

2.8% of the students suggested performing the HbA1c test to analyze the patient's blood glucose level. 25.6% of the students mentioned contacting the attending physician to find out if the diabetes is balanced.

To assess the knowledge about diabetes among dental students at Dental College in Salem, India, Bharath.C& colleagues (3), conducted a survey of fourth-year dental students in 2017. Nearly half (49.9%) of the students were unaware that HbA1c is an accurate test for assessing blood glucose. 56% of the students checked blood glucose levels in patients before the dental procedure began. However, these percentages are still better than those of our students, which accentuates the difference in the level of knowledge between the students of the Casablanca faculty and those of the Salem faculty.

15.4% of our students suggested antibiotic prophylaxis before endodontic treatment and scaling. A study was conducted by Lesclous P. (11), in 2011, concerning antibiotic prescribing, not among trainees, but among dentists, without presenting the percentages.
Further studies concerning drug prescriptions in diabetic patients, among trainees, should be carried out internationally, giving the percentages, so that they can be compared with those of our faculty.

In our study, 20.5% of the students thought that implants were contraindicated in diabetics, without specifying the type of diabetes. There was no survey of students in other countries regarding the indication of implants in a diabetic patient. In contrast, the 2013 study by Kansal G. & al (9), targeting graduate physicians, reported that implant dentistry is not contraindicated in most diabetics, without specifying rates.

There is a lack of international surveys of trainees regarding the diabetic patient and a lack of knowledge among our students about the precautions to be taken for the diabetic patient. Moreover, 2,5 million Moroccans are affected by this disease. Some of the misconceptions among students need to be corrected, as academic dental institutions are considered safety nets for low-income populations.

Parkinson's patient:

19.7% of students felt that care should be performed under deep sedation, if not general anesthesia. Similarly, the study by Roche Y. (12), in 2010, concerning the medical risks for the Parkinsonian in the dental office, indicated that in case of failure in the vigil state, passive cooperation can be obtained by the different sedation techniques, however without specifying the percentages. Studies should be conducted in the future with trainees at the end of training to evaluate the indication of sedation and general anesthesia for the patient with Parkinson's disease.
3.4% of the students thought that implants were contraindicated in the Parkinson's patient. In contrast, the work done by Sanjay J. & al (14), in 2018, targeting dentists, indicated that implant surgery appears to be the safest procedure in the Parkinson's patient, however without specifying rates. The quality of oral and general health improved with the use of implant-supported prosthesis and is associated with a marked increase in masticatory ability.

There is a need for further studies internationally to compare decision making about Parkinson's patients among trainees. Indeed, the epidemiological literature among trainees regarding Parkinson's patients is still scarce. This leaves us with more questions than answers.

Candidate patient for cavum radiotherapy + alcoholic and smoker:

20.4% of students offered to do the care before radiation therapy, 4.4% offered to do it after radiation therapy. 8.5% proposed to do leaded gutters. 3.4% suggested antibiotic prophylaxis before the procedure. The study carried out by Farsi F. & all (8), in 1999, aimed not at trainees but at dental surgeons, presented recommendations concerning the precautions to be taken for good odontological practice in cancerology, without presenting the percentages.

Future studies should be conducted to compare the actions for patients undergoing radiation therapy with trainees at the end of their training. The rate of students who did not respond in our survey regarding the measures to be taken and the necessary considerations is 6%.

Similarly, in the study done by Alpöz E. & all (2), in 2013, aiming to examine the knowledge level of Turkish junior dental students, regarding the treatment methods of patients with ENT sphere cancer: Respondents preferred not to answer the questions about the prophylactic measures that the dentist should take during an oral evaluation of pre-cancer treatment (9.1%), pain management in cancer treatment (6.5%), and necessary considerations before a dental procedure (3.9%).

We can see that knowledge of how to manage the patient candidate for radiation therapy varies among students. Reassessment of current undergraduate curricula and continuing graduate education could address the identified gaps, and an educational program on the oral and dental management of patients who are to receive/have received cancer therapy can be prepared and integrated into the dental curriculum.

Cancer patients requiring prosthetic rehabilitation:

17.9% of students judged that a removable prosthesis should be performed. 6% proposed to do conventional bridges.

In an opposite way and without presenting the percentages, the study conducted by Akarsalan Z. (1), in 2017, found that dentists who treated patients with cancer of the ENT sphere with fixed or removable prosthesis did not report a significantly greater impact of fixed prosthesis than removable prosthesis on health-related quality of life.

Since this study was not conducted with trainees, and since there has been no survey in the international literature to investigate students' choice between removable and fixed prosthesis for the patient with ENT cancer, this factor cannot be compared with the present study.

Implants in irradiated patients :

23.9% of students proscribed implant surgery due to the risk of non-healing, osteoradionecrosis, and the risk of peri-implantitis.
In a similar way, but without presenting the rates, the results published in the study conducted by Zheng M. (16), in 2014, demonstrated that radiation therapy is an important factor in implant failure. Radiation predisposes to changes in bone, skin, and mucosa, which affects the predictability of implant osseointegration. However, this survey was not conducted with students, but with dentists. Therefore, the results cannot be compared.

There was no survey of students regarding the choice of implant indication in patients who are candidates for radiotherapy, and further studies should be conducted at a later date.

Alcoholism:

2.6% of students felt that transaminases and CBC should be monitored. However, platelet count and PT value were not mentioned.
Similarly, the study by Roche Y. (13), among dentists in 2010, showed that before performing care, it is necessary to know the values of the TP, the NFS, the platelets, and to measure the transaminases (ASAT, ALAT), but without specifying the rates of the results.
This study is about precautions and management of the alcoholic patient in the dental office by the dentist. There have been no studies on the measures to be taken for alcoholic patients among students in the final stages of training. Studies should be done in the future.

Smoking and Implants :

In our study 23.9% of students recommended not to use implants because of the risk of failure.

Similarly, the study done by Kasat V. & colleagues (10), in 2012, demonstrated that clinical trials conducted by dental surgeons on implants consistently point to smoking as a primary risk factor for implant loss, however without specifying rates.

Because there was no survey of trainees regarding the indication for implants for patients with smoking, we do not have a specific figure to compare this parameter with other studies. The knowledge of the students concerning the candidate patient for radiotherapy and alcoholics is limited. Only a small proportion have thought of certain precautions to be taken. This state of affairs reflects a lack of awareness on the part of the students and the need for them to make more effort.

V. Conclusion:

Senior year students exhibited a weakness to correctly predict the protocol to be undertaken for at-risk and specific patients. The international epidemiological literature is still scarce among dental trainees, thus further studies are needed in the future to compare results. To promote problem solving skills there is still a need for more and better learning techniques:

- In-class activities, such as note writing, problem analysis, or case review that provide opportunities to apply the information provided.

- The use of questions by instructors that ask students to analyze the etiology of problems, compare alternative approaches, provide rationales for courses of action, and predict outcomes.

- Frequent in-class quizzes with immediate feedback on the accuracy of responses.

- Clinical simulations in which students make decisions for structured and unstructured problems.

- Retrospective critique of cases in which decisions are reviewed to identify errors as well as exemplary performance.

- Write assignments that require students to analyze problems and discuss alternative theories of etiology, compare solutions, and defend decisions regarding proposed actions.

- Analyze results to compare how they match best practice standards, including comparing the results of students' reasoning about problems to those of experts.

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QUESTIONNAIRE

Dear colleague, dear colleague,

I am a student in the process of writing my thesis at the Faculty of Dentistry of Casablanca. My thesis topic is entitled: "Decision-making in case management in fixed prosthesis by trainees at the end of their training".

The aim of my investigation is to evaluate the clinical reasoning process in the trainees at the end of their training in the framework of case management in fixed prosthesis.

The questionnaire includes a clinical case with documents (photos, x-rays, and patient study model).

I would like to ask you to state your decision regarding the therapeutic solution(s) to be proposed for the different situations. I would like to express my appreciation and thanks for your time in completing this form.

Presentation of the case

- Mrs H.A, 38 years old, who consulted us for a restoration of the oral cavity and an aesthetic and functional prosthetic rehabilitation

-On the general plan: Good general health
- Periodontal: plaque-related gingivitis
- On the articular level: No clicking or cracking on closure
- Straight path on closure
-Occlusal level:
-maxilla circumscribes the mandible
- Class I canine and molar right and left
- No coincidence of inter incisor points
- functional anterior guid

DENTAL EXAMINATION

- 18:Site 1 stage 2
- 17:Site 1 stage1
- 16:
- 15: Bonded Bridge
- 14:
- 13:Healthy
- 12: absent
- 11: Correct root canal treatment
- 21: healthy
- 22: healthy
- 23: healthy
24: absent
- 25: absent
- 26: Site 1 stage 1
- 27: CarieS1 stage 4
- 28: I.S.O
- 48: absent (extracted)
- 47:Site 1 stage 2
- 46:Site 1 stage 2
- 45: healthy
- 44: healthy
- 43:healthy
- 42: healthy
- 41: healthy
- 31: healthy
- 32: healthy
- 33: healthy
- 34: absent
- 35: Caries stopped (M)
- 36: I.S.O
- 37:Site 1 stage 2
- 38:Site 1 stage 2

Situation 1 :

The patient is from a low socio-economic level and has financial problems, therefore he is a rambler. What solutions do you propose?

Situation 2 :

We inform you that the patient has insulin-dependent diabetes. What solutions do you propose?

Situation 3 :

The patient has Parkinson's disease, and therefore has a psychomotor problem that prevents him from maintaining acceptable oral hygiene. What solutions do you propose?

situation 4 :

The patient is a smoker and an alcoholic, he is also a candidate for radiation therapy for cancer of the Cavum. What solutions do you propose?