

Patient Management and Preventive Dentistry

“Educating the educated”: a case report and discussion of an undergraduate medical student with multiple carious lesions and poor dietary habits

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ABSTRACT:

It is evident in the undergraduate dental curriculum that competent dental students are expected to have a broad knowledge of the intricacies of the human body and its relationship with the oral cavity but the same cannot be guaranteed for medical students. This case report of a medical undergraduate student who presented with multiple carious lesions and a poor knowledge of the impact of her habits on her oral health illustrates the importance of using a well-formulated and holistic treatment plan with a focus on oral health promotion and education. The review appointment proved promising with an improved plaque score and dietary analysis.

CLINICAL RELEVANCE:

This case re-iterates the need to encompass education and prevention to stabilize and prevent dental caries and teach other future healthcare professionals so they can utilize and consider this knowledge in the management of their own patients. Moreover, it demonstrates that there may be a scope for raising dental awareness and education within the medical profession.

OBJECTIVE STATEMENT:

To explore and discuss a case involving an undergraduate medical student with multiple carious lesions and poor dietary habits.

INTRODUCTION

Although dental practitioners possess a detailed knowledge of the management and multifactorial aetiology of dental caries, treatment remains predominantly operative, failing to address the long-term consequences and the likelihood of new carious lesions, further progression of existing early carious lesions and caries adjacent to restorations. It may be suggested that this is due to the time constraints dental professionals may face in trying to stabilize and restore carious lesions whilst also providing the thorough education and preventative advice needed to aid the patient with the necessary knowledge of how their behavior can impact their oral health.

Due to their intellectual ability and general understanding of the human body, it may be incorrectly assumed that medical students are aware of the importance of good dietary habits and oral health education in reducing the risk of dental diseases in themselves and their patients. Consequently, this may also lead to a reduction in the time and effort invested into educating them about their habits. Recent literature suggests that this may not be the case. For example, in a cohort of undergraduate medical students in India, dental caries status was significantly affected by factors such as high dental anxiety and poor plaque control [1]. Kumar et al., (2010) identified that 75.7% of these students brushed their teeth once daily [1]. A similar study identified that only 35.5% of medical students who participated, were aware that they can reduce their susceptibility to dental caries through regular brushing and dental attendance, reduced sugar consumption and using fluoride [2]. This patient stated that the aetiology and management of dental diseases have not yet been implemented into the undergraduate curriculum.

This aim of this clinical case report of a medical undergraduate student, who presented with multiple carious lesions, is to demonstrate the importance of using a personalized and detailed history and examination to construct a well-formulated holistic treatment plan. It also

re-iterates the need to encompass education and prevention to stabilize and prevent dental caries and teach other future healthcare professionals so they can also utilize and consider this knowledge in the management of their own patients. Moreover, it demonstrates that there is still scope for raising dental awareness and education within the medical profession.

CASE REPORT:

A 22 year old female attended the undergraduate restorative clinic for a general check-up at Barts and the London School of Medicine and Dentistry. Having last visited a dentist 2 years ago, the patient was an irregular dental attender. She admitted being anxious regarding the dental appointment.

Her medical history revealed well-controlled Irritable Bowel Syndrome with no medications. There were no known allergies reported.

Careful questioning concluded that her lifestyle is stressful and hectic as a medical student and she had a highly cariogenic diet with frequent sugar consumption on weekends whilst studying (Figure 1). The patient brushes her teeth twice daily using a standard fluoridated dentifrice with an electric toothbrush but failed to regularly use interdental cleaning aids and was unaware of the significance of fluoride usage. Before bed, whilst studying, the patient would continue to snack after brushing her teeth (Figure 1).

Clinical examination revealed a minimally restored dentition. Generalised marginal and interproximal plaque deposits were visible with mildly inflamed gingivae with immediate bleeding on probing in all sextants. The Basic Periodontal Examination scores were all marked as "2" except a score of "1" in the maxillary anterior sextant.

Clinically, suspected carious lesions were visible at the LL6 (distal), LL7 (mesial), LL8 (occlusal) and LR6 (distal). (Figure 2). These teeth were symptom free and the patient was

surprised at the findings. Additionally, bitewing radiographs (Figure 3) revealed further radiolucencies consistent with caries:

- Radiolucencies at the LL6 (distal), LL7 (mesial), UL6 (mesial), UL5 (mesial), UL4 (distal), LR6 (distal), UR4 (distal), UR5 (mesial), UR6 (mesial)
- Generalised minimal horizontal bone loss

The following diagnoses were subsequently made:

- Dental caries: LL8, LR6, UL6, UL5, UL4, UR5, UR6
- Caries confined to enamel: UR4, LL6, LL7
- Plaque induced gingivitis

The treatment plan for this patient was divided into three main stages to ensure that a holistic approach to treatment planning was adopted and to help to reduce the patient's high caries risk and dental anxiety.

1) Investigation, Stabilisation and Prevention Phase:

- Baseline assessments: plaque distribution chart (47.7%) (Figure 4) and bleeding points index (11%)- also used to aid education and provide sufficient oral hygiene instructions to the patient
- Diet analysis and education: using a diet sheet to explain the link between her dietary habits and dental caries and to identify contributing factors and assess the frequency of sugar intake
- Oral hygiene instructions using interdental cleaning aids and a demonstration of the appropriate brushing technique
- Full mouth supragingival debridement and polish

2) Restorative and Rehabilitation Phase: Direct restoration of teeth with dental caries into dentine

3) Maintenance and Monitoring Phase:

- Monitor dentition and teeth with early carious lesions: Apply fluoride varnish (2.2% Sodium Fluoride), repeat at least twice yearly and consider prescribing a high fluoride toothpaste
- Regular maintenance through review appointments to ensure that plaque control and diet are improving and no new carious lesions develop and monitor progression of lesions confined to enamel.

Subsequent appointments demonstrated that this systematic and methodical approach to treatment planning equipped the patient with the necessary knowledge and motivation to help stabilize and improve her oral health. As the patient was considered to be high caries risk, a reduced recall interval of 3 months, following the initial phase of treatment, was most appropriate. The review appointment identified that no new carious lesions developed and the patient had retained information and education provided previously, adopted a more adequate oral hygiene regime and was more positive about the power she has to maintain and improve her oral health. Her reduction in plaque and reduced frequency of sugar consumption and snacking after brushing in the evenings proved promising (Figures 4 and 5).

DISCUSSION

With such a case, detailed history taking to identify a cariogenic diet and stressful lifestyle is the milestone of the consultation. This can be used to formulate a personalised treatment plan that places an emphasis on prevention and education. Interestingly, this patient was aware of the benefits of a healthy and balanced diet and the effect of dietary carbohydrates on the human body, however, her awareness of their impact on her oral health was poor. Many students go through a transition period when they are at university. During this period,

their routine lifestyle with their parents may discontinue and they may acquire a different perspective in eating habits.

It is also crucial that the dental anxiety of the patient is considered when treating and managing her oral health. Al-Omari and Al-Omiri assessed the anxiety scores for dental treatment amongst university students. The results revealed the highest dental anxiety scores for medical students and female students in all subjects when compared to the engineering and dental students [3]. Kumar et al. also identified that female medical students exhibited greater dental anxiety than male medical students [1]. It has been suggested that ultimately dental anxiety may lead to irregular dental attendance within female medical students [4] and that it is related to personality traits and psychological status [5]. These could be the main factors for the presence of higher levels of dental anxiety amongst female medical students but may also encourage poor dietary habits.

Many students go through a transition period at university where their routine lifestyle with their parents may discontinue and they may acquire a different perspective in eating habits. During the university years, the harsh reality of a competitive environment, continuous assessments, and psychological challenges may lead to inadequacy and self-doubt. All these factors may then contribute to conscious or unconscious eating habits that can adversely affect their oral health. The factors could be related to working stressful hours, staying up late to study, and long days on placements.

To aid management, prior to commencing restorative treatment, oral health promotion could begin with an explanation of the well-established link between dietary sugars and dental caries. A diet diary, containing work days and leisure days, is a useful tool for doing this. It enables the identification of the frequency of sugar intake as well as quantity. Whilst evoking behavior change is more complex than this, it is useful in building a strong therapeutic relationship with patients as well as preventing the patient from having such frequent sugar

consumption within a day. This may reduce the dental anxiety slightly at the first visit and also their fear and anxiety related to subsequent dental treatments.

Additionally, with patients of high caries risk and active dental caries, the prescription of a high fluoride toothpaste could be considered. Current Public Health England guidelines suggest that toothpaste with a high fluoride concentration may be prescribed in patients with active disease [6]. According to these guidelines, for patients aged 10 or over, toothpaste containing 2,800 ppm fluoride may be prescribed whilst, for patients aged 16 or over, either 2,800 ppm or 5,000 ppm fluoride toothpaste can be prescribed [6]. Clinicians may prefer to prescribe the lower concentration of 2,800 ppm in young patients since there is currently insufficient evidence to support that toothpaste containing 5000 ppm fluoride has a superior effect to the 2,800 ppm dentifrice for the management of dental caries [7]. In this respect, the adverse systemic effects of long-term exposure to a higher concentration of fluoride also remain uncertain [8, 9].

The lack of oral health knowledge demonstrated by the medical student was concerning. Taking time to identify patient risk factors and provide the basic knowledge in oral health could raise patient awareness. It is important that medical students and practitioners have a reasonable knowledge regarding dental caries and assessing the risk factors to improve the general health of their patients.

By joining dental practitioners at the forefront of the healthcare profession, medical practitioners are also influential and suitable for helping to reduce the global burden of dental caries by educating their patients on the impact of habits such as poor diet, and fluoride use on their oral health. Further literature suggests that there is an unacknowledged need to identify and assimilate information regarding medical student's perceptions and knowledge of oral health [10-11]. It has been suggested that one way of achieving this is through embedding oral health teaching into the undergraduate medical school curriculum [11-13].

However, there is currently insufficient available evidence identifying the effectiveness of this approach.

Conclusion

This is an interesting case suggesting a potential lack of dental awareness within the medical profession and undergraduate medical curriculum. This emphasises that there is a greater need to investigate the teaching and oral health perceptions of medical professionals. This case also highlights the importance of adopting a holistic approach to the history-taking process by asking questions about anxiety, stress and daily routines. There is a need to ensure that patients of all educational backgrounds are provided with adequate preventative dietary and oral hygiene advice to alleviate the demand for multiple restorative treatments at young age and to help ensure that solidarity remains amongst healthcare professionals to maximize the chances of reducing the global burden of oral diseases.

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FIGURES

Figure 1. Diet analysis sheet at the beginning of treatment

DAY	BREAKFAST	IN-BETWEEN	MID-DAY	IN-BETWEEN	EVENING	BEFORE BED
THURSDAY	10am - Tea (2 sugars) - 3 digestive biscuits	12pm - Stuffed rotis	3pm - Mini margarita pizza	3:30pm - Mandu (dumplings)	9pm - Lentil curry with naan bread	11pm - 2 chocolate chip cake bars
FRIDAY	11am 12pm Banana Hot chocolate and chocolate caramel shortbread	--	--	1pm - Hummus and pitta bread	3pm 6pm - Chocolate chip cake - Tea (2 sugars) and packet of crisps	10pm - Lentils with rice and water 10:30pm - Chocolate bar
SATURDAY	10am - Tea (2 sugars) - Digestive biscuits	11am - Chocolate bar	1pm - Stuffed peppers, rice and orange juice	1:30pm 5pm - Cheese cake - Teacake	7pm - McDonalds burger with fries and Coke	11pm - Coffee (2 sugars)
SUNDAY	10am - Tea (2 sugars) - Digestive biscuits	1pm - Banana and strawberries with milk	2pm - Tuna sandwich and orange juice	2:30pm 4pm - Chocolate chip cake - Crisps	7pm - Fried fish with chips and Coke (2 glasses)	-- --

Figure 2. Clinical examination revealed generalised stained fissures posteriorly, enamel caries at the LL67 and dental caries at the LL8 and LR6



Figure 3. Left and right bitewings taken at initial screening appointment

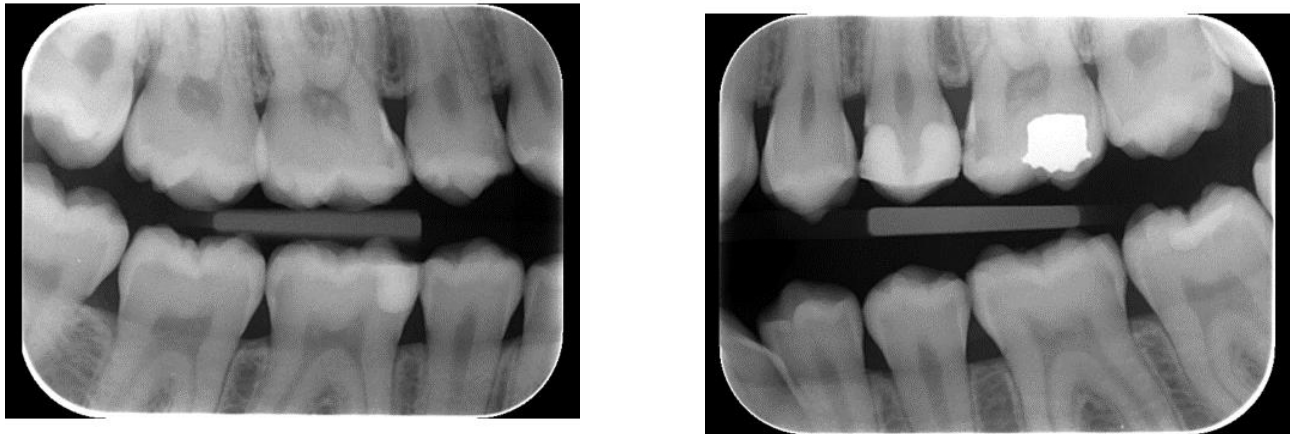


Figure 4. Plaque index at initial screening appointment and at post-treatment review appointment

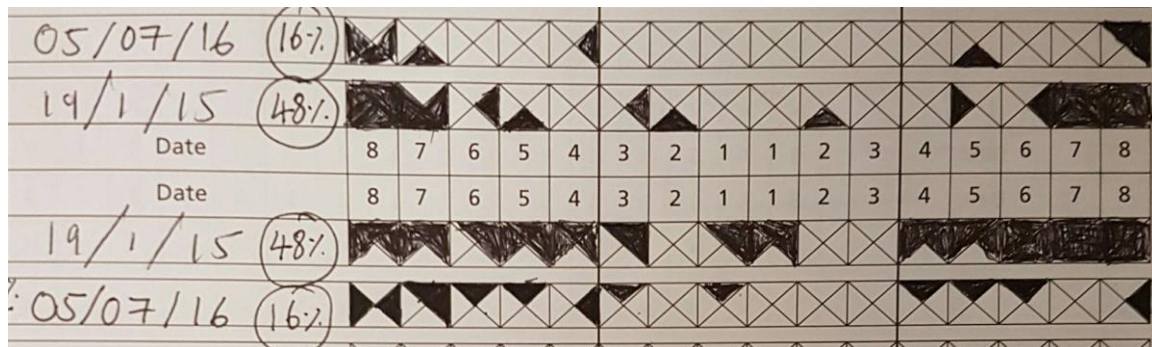


Figure 5. Diet analysis sheet at review appointment

DAY	BREAKFAST		IN-BETWEEN		MID-DAY		IN-BETWEEN		EVENING		BEFORE BED	
	THURSDAY	9am	- Bran flakes	--	--	12pm	- Water	--	--	8pm	- Curry and chapatti with water	--
FRIDAY	9am	- Fruit and nut cornflakes	--	--	1pm	- Pasta and water	--	--	9pm	- Curry and chapatti with juice	--	--
SATURDAY	9am	- Bran flakes	--	--	12pm	- Chicken sandwich and water	--	--	8pm	- Curry and chapatti with juice	--	--
SUNDAY	10am	- Sausage, bacon, eggs	--	--	1pm	- Pasta and water	--	--	7pm	- Roast chicken and chips	--	--