BioMin Case Study: 2017 Competition winner

Fiona Ord

Fiona Ord, a dental hygienist working in Edinburgh, who started her career in Melbourne, Australia, has won BioMin's 2017 Clinical Case Study Award. The judges noted that Fiona developed a very logical treatment plan which coupled with appropriate and detailed oral hygiene instructions resulted in an excellent clinical outcome. Fiona's delivery of the treatment plan has clearly enhanced the patient's quality of life.

Dental Health does not normally feature brand names in editorial, other than paid advertising, however we are keen to encourage BSDHT members to become involved in research projects and this is a good example of a case study. We hope this inspires you to enter next year.

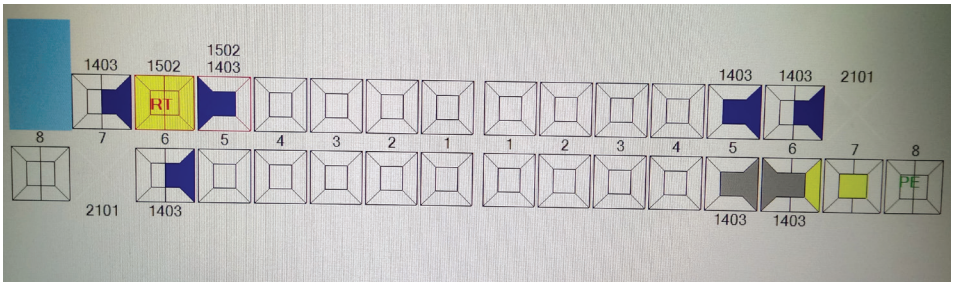

FIGURE 1: CLINICAL DENTAL CHART AT BASELINE AND TREATMENT REQUIRED

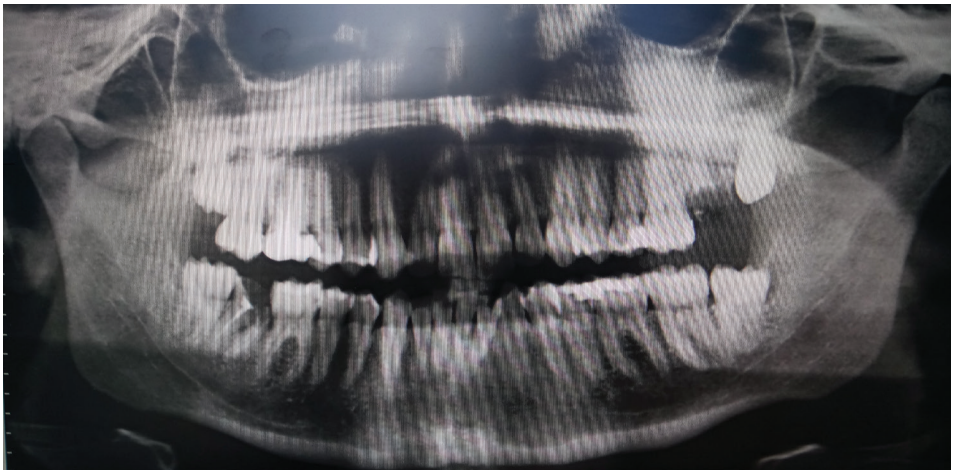

FIGURE 2: RADIOGRAPH DPT

Background

A 32 year old female (LA), presented at the practice for a routine check-up as a new patient. In the completed new patient registration paper work LA indicated that her teeth were sensitive. She also reported that she had some other teeth that were "broken".

Reason for Attendance

Routine check up at new practice

Medical History

The only medical history of note was that she suffers from asthma and carries a salbutamol inhaler.

Social History

The patient is a non smoker and has never smoked. She consumes 2 to 3 units of alcohol per week and is a nurse, with a changeable shift pattern.

Dental History

LA has been a semi regular dental patient throughout her life, attending the same dental practice since childhood. She admits to periods of non attendance whilst a university student, and for a few years afterwards. She relocated to a new area, which prompted registration with a new practice.

All new patients to the practice are asked to complete paperwork which includes detailed questions regarding their medical history, dental experience, anxiety, appearance, gums (gingival) bleeding, sensitive teeth and any additional information they feel may be relevant. It was on this questionnaire LA indicated she was suffering from sensitivity.

Treatment

The dentist completed a full examination including diagnostic radiographs (Figs. 1-3). Potential sources of sensitivity e.g. faulty restorations and caries were subsequently eliminated. A treatment plan was then formulated for non surgical periodontal therapy and the patient was referred to the dental hygienist (author).

Hygiene appointment

The following information about the patient's current habits, regime and dental experience was noted:

Brushing:

Twice daily, with an Oral-B electric toothbrush: once prior to going to bed and the other time before leaving the house to work her shift.

Interproximal cleaning:

Weekly, using floss

Toothpaste:

Choice was generally determined by: "whatever is on special, but I try to stick with the brands I know, like Colgate".

Whitening:

Previously had whitening treatment but not

in past 12 months, as it caused an increase in her sensitivity. Her whitening trays had been made by her previous dentist.

Diet:

Attempts to eat three meals per day, but this is often difficult depending on her shift patterns. She often works through the night. Throughout her hospital shift she tends to consume 2-3 cups of tea without sugar. Occasionally she will eat a biscuit or some chocolate at the same time.

She rarely drinks carbonated drinks or fruit juice, but if she does then this tends to be mostly at meals times.

Sensitivity:

Character and site: La described this as a, *"Shooting pain on back top teeth and front top and bottom teeth"*.

Onset: This tended to be caused by, *"Anything cold hitting the teeth, including the cold weather (air)"*.

Sensation: generally the pain lasts for between 10 – 30 seconds, longer if it was the cold air that brought on sensation.

Occurrence: 1-2 times per day, *"But I try to avoid anything that I think would cause the feeling."*

Severity of pain: LA rated this as 7 or 8 out of 10.

Although LA had experienced sensitivity over several years, she had not used over the counter or self help products. She cannot remember mentioning it to her previous dentist, except during her teeth whitening appointments. At this point she was advised that the sensation would reduce once she stopped bleaching, and to fill the trays with toothpaste and keep in for a couple of hours before whitening.

Diagnostic tests:

Basic Periodontal Examination (BPE) was recorded (Fig. 4).

"The BPE is a simple and rapid screening tool that is used to indicate the level of further examination needed and provide basic guidance on treatment needed."[1]

BOP	Y	N	Y	BOP
BPE	2	2	2	BPE
BPE	3*	2	2	BPE
BOP	Y	N	Y	BOP

FIGURE 4: BPE

Gingival Recession – buccal	M	0	0	0	1	0	0	0	1	0	0	1	1	0	M	M	Gingival Recession – buccal
Gingival Recession - Lingual	M	0	0	0	0	0	0	0	0	0	0	0	0	0	M	M	Gingival Recession - lingual
Upper	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	Upper
Lower	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	Lower
Gingival Recession – lingual	0	M	1	1	0	0	0	0	0	0	0	0	0	0	0	PE	Gingival Recession – lingual
Gingival recession – buccal	0	M	1	2	2	0	2	0	0	2	0	0	2	2	2	PE	Gingival recession – buccal

FIGURE 3: GINGIVAL RECESSION, MEASURED AT FIRST APPOINTMENT

LOWER RIGHT AND LOWER LEFT BUCCAL

LOWER LABIAL

Gingival recession and exposed dentine at root surfaces

For sensitivity to occur, the covering layer over dentine has been removed, and the loss of the smear layer covering the dentine tubules leaves the tubules open and exposed. Exposed dentine does not always correlate to sensitivity.[2]

Recession and exposed dentine are recorded in millimetres for buccal and lingual surfaces.[3]

Plaque and calculus

The presence of light interproximal supragingival calculus localised to mandibular anterior 43-33 teeth was noted along with light buccal supragingival calculus localised to maxillary molars 17,16 and 26. There was generalised interproximal plaque.

Erosion (BEWE)

The Basic Erosive Wear Examination (BEWE) provides a simple reproducible scoring system, that records surface area tooth loss. Each sextant is scored and sum of scores is calculated to classify a patient's risk.[4]

The patient's risk was categorised as low. (Fig.5)

1	1	1
1	1	1

FIGURE 5: BEWE SCORE PER SEXTANT

Schiff Cold Air Sensitivity Scale

This records the degree of the sensitivity expressed by the patient to a short blast of air directed at the buccal surfaces of each tooth. The patient responds to the stimulus and a score between 0 – 3 are recorded.[5]

This test was completed immediately after a scaling procedure. The mean Schiff value was 1.94.

Figure 6 shows the patient's response to Schiff Cold Sensitivity Scale, before and after the intervention of BioMinF toothpaste and oral hygiene amendments

Dentine Hypersensitivity Experience Questionnaire – 15

This is a shortened version of a quality of life questionnaire that measures aspects of dentine sensitivity. Data analysis of the DHEQ 15 involves adding the scores for each of the 15 questions, on a likert type scale from "strongly disagree" to "strongly agree" for a score between 15 – 105.[6]

A score of 65 was recorded pre intervention. (Fig. 7a and 7b).

Diagnosis

Dentine hypersensitivity was diagnosed as the cause of the sensation experienced by LA. The diagnosis was made in collaboration with the dentist and the use of diagnostic special tests assisted to include and exclude aetiological factors.

Canadian Advisory Board on Dentin Hypersensitivity (2003) definition: "Dentine hypersensitivity is characterized by short, sharp pain arising from exposed dentine in response to stimuli, typically thermal, evaporative, tactile, osmotic or chemical and which cannot be ascribed to any other dental defect or disease."[7]

Treatment plan

LA was fully informed of the nature of this case study and gave consent for her participation and agreed to attempt to comply with the modifications to oral hygiene, diet, and toothpaste usage over a 10 week period. All information was also given in written format. Ethical approval was not sought for this case study. The author utilised the NHS Research authority decision tool, to determine approval was not required.

Oral hygiene

Her brushing technique was reviewed to ensure that she was not mechanically traumatising the soft gingival tissues, or using excessive force. An effective brushing method was reinforced, to assist removal of plaque, biofilm and debris deposits, leading to gingival inflammation, bleeding and pocketing. Suggestions were made to amend the timing of brushing to maximise the topical effects of fluoride. She was advised to continue with brushing: once before bed and recommended to brush on waking, and prior to eating. A 'tell, show, do' demonstration method with floss was

After	M	0	0	0	0	0	0	1	1	0	0	0	0	0	M	M	After
Before	M	2	0	3	3	3	3	0	2	0	0	2	2	0	M	M	Before
Upper	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	Upper
Lower	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	Lower
Before	0	M	1	1	1	2	1	2	2	2	0	0	1	0	0	PE	Before
After	0	M	0	0	0	0	0	1	1	0	0	0	0	0	0	PE	After

FIGURE 6: BEFORE AND AFTER BIOMIN F INTERVENTION – 10 WEEKS

given, to show correct effective flossing technique.

Diet

A food diary was not completed as part of this case study as there is low clinical evidence of erosion or early caries lesion. Dietary advice was given to reinforce limiting the frequency of food and drink intake, especially carbonated drinks, and juices to meal times

Sensitivity

I recommended she use BioMin F toothpaste twice per day to help reduce incidence of sensitivity with intake of cold food and drinks and cold air. A sample of BioMin F was supplied. Product information including ingredients were accessed from the BioMin website.

The "spit, don't rinse" method was also recommended and reinforced to increase the time the toothpaste remained in the oral cavity.

LA was also asked to keep a record of her experience with the BioMin F toothpaste, including the taste, texture, frothiness, ease of use and any additional details.

Follow up

The patient returned to the practice 10 weeks after the initial appointment when BioMin F toothpaste had been introduced and modifications made to her oral hygiene methods and diet.

Oral hygiene

At this point it was noted that her oral hygiene had improved over the 10 weeks and there were minimal plaque and calculus deposits present. She had changed her brushing times, although she admitted that,*"it was difficult at first to brush before breakfast."*

Regarding her interproximal cleaning, flossing, habits she reported that she was, *"Getting there, about 3 times per week. It depends on my shifts."*

Diet

LA had made no changes to her diet pattern, but reported that she had become more conscious of the food and drink choices that she made.

Sensitivity

LA reported, not rinsing her mouth after brushing, she enjoyed the taste of the paste and this encouraged her to continue to use the product.

The Schiff Cold Air Sensitivity Scale was recorded after a scaling procedure. The mean score had reduced from 1.94 to 1.

A DHEQ 15 was also completed again by LA at this point where the score had reduced from 65 to 25.

The main improvements on scale from "strongly agreed" and "agreed" to "disagree" and "strongly disagree" were related to food and drink intake, breathing cold air and the irritating sensations in her teeth. The answers are categorised by questionnaire

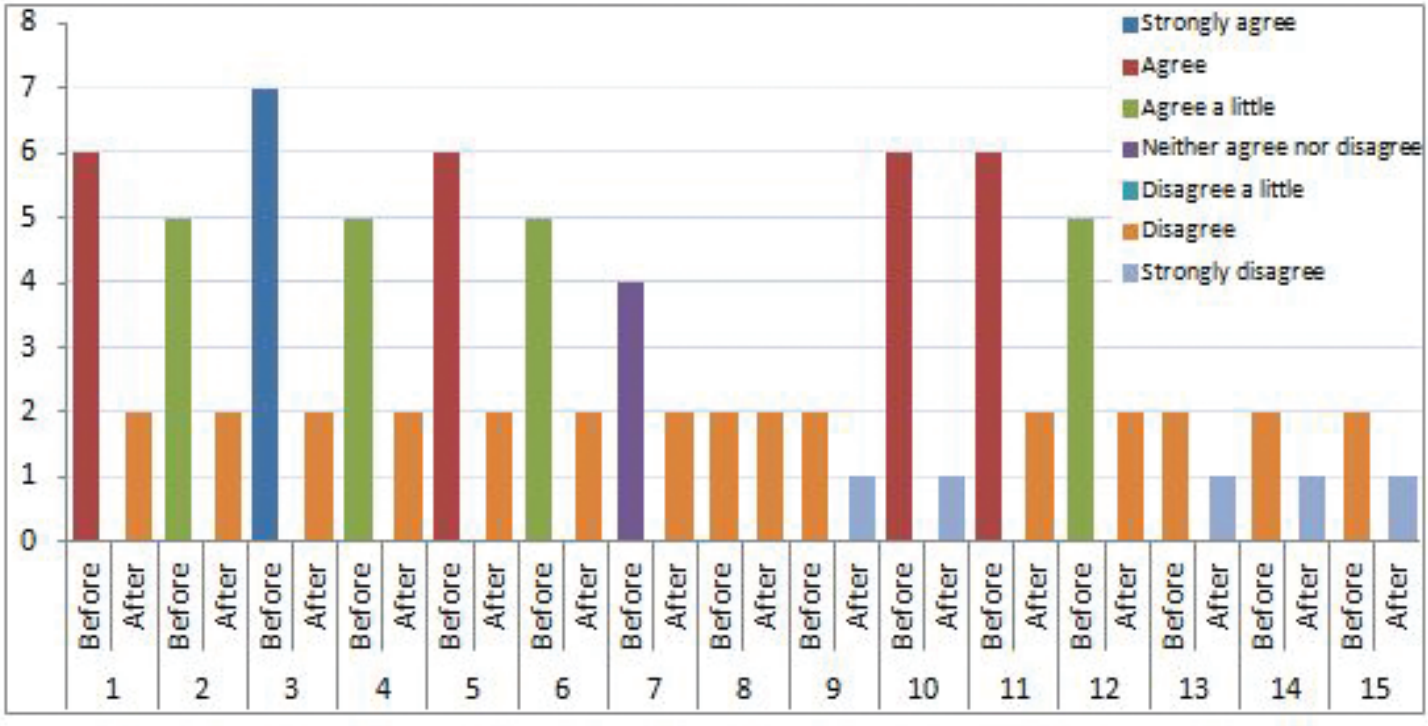

FIGURE 7A: SELF REPORTED DHEQ15, BEFORE AND AFTER INTERVENTION – 10 WEEKS

1. Having sensations in my teeth takes a lot of the pleasure out of eating and drinking.
2. It takes a long time to finish some foods and drinks because of sensations in my teeth.
3. There have been times when I have had problems eating ice cream because of these sensations.
4. I have to change the way I eat or drink certain things.
5. I have to be careful how I breathe on a cold day.
6. When eating some foods I have made sure they don't touch certain teeth.
7. Because of the sensations I take longer than others to finish a meal.
8. I have to be careful what I eat when I am with others because of the sensations in my teeth.
9. Going to the dentist is hard for me because I know it is going to be painful as a result of sensations in my teeth.
10. I've been anxious that something I eat or drink might cause sensations in my teeth.
11. The sensations in my teeth have been irritating.
12. The sensations in my teeth have been annoying.
13. Having these sensations in my teeth makes me feel old.
14. Having these sensations in my teeth makes me feel damaged.
15. Having these sensations in my teeth makes me feel as though I am unhealthy.

FIGURE 7B: SELF REPORTED DHEQ15, BEFORE AND AFTER INTERVENTION – 10 WEEKS

developers into: restrictions, approach, coping and emotion.

Conclusion

Over the 10 week period, LA experienced a reduction in her sensitivity. Factors contributing to this included the use of BioMin F toothpaste and changes to her oral hygiene regime. The BioMin F toothpaste was found to be pleasing and practical which promoted its continued use.

Discrepancies may exist between the clinician's and patient's perceptions of sensitivity. The Schiff Cold Air Sensitivity Scale and DHEQ-15, were critical in evidencing positive clinical and patient self reported outcomes.

Although LA had not previously discussed her general tooth sensitivity with her dental team or tried an over the counter product, she was motivated to try a product that would reduce the sensitivity she suffered in her daily life. She was pleased that she was able to reduce the impact of sensitivity with minor behaviour changes. The behaviour modifications were introduced to improve overall oral health, rather than specifically to reduce tooth sensitivity as this was more conducive to a common risk factor approach of improved health.

References

1. 1.British Society of Periodontology (2016). Basic Periodontal Examination (BPE), revised March 2016 Available from http://www.bsperio.org.uk/publications/downloads/39_150345_bpe-2016-po-v5-final.pdf
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3. 3. Scottish Dental Clinical Effectiveness Programme (2014). Prevention and treatment of periodontal diseases in primary care. Available from: http://www.sdcep.org.uk/wp-content/uploads/2015/01/SDCEP+Periodontal+Disease+Full+Guidance.pdf
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5. 5. Schiff T, Dotson M, Cohen S et al. Efficacy of a dentifrice containing potassium nitrate, soluble pyrophosphate, PVM/MA copolymer, and sodium fluoride on dentinal hypersensitivity: A twelve week clinical study. *J Clin Dent*. 1994;**5 (Spec Iss)**:87–92.
6. 6. Machuca C, Baker SR, Sufi F et al. Derivation of a short form of the dentine hypersensitivity experience questionnaire. *J Clin Periodontol*. 2014; **41(1)**: 46-51.
7. 7. Canadian Advisory Board on Dentin Hypersensitivity. Consensus-based recommendations for the diagnosis and management of dentin hypersensitivity. *J Can Dent Assoc*. 2003;**69(4)**:221-6.

The company will publish details of the 2018 Clinical Case Study Competition in February next year. Please indicate your interest to participate at admin@biomin.co.uk and details will be sent directly to you.