Caries management of proximal caries lesions during an infiltration case study (split mouth study)

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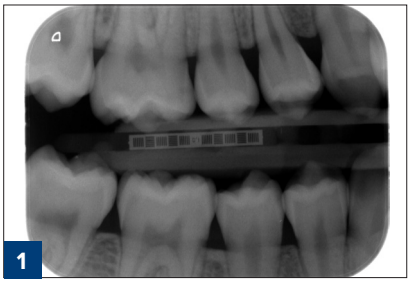
The teenager M.D. has been a patient in our dental practice since 2004. She was 7 years old at the start of treatment. We regularly measured PI values. Up to 2012 the values tended to be between 17% and 35%, 57% in 2013 and 53% in 2014.

During the case study, bitewing images were made with a special film holder. The film holder was loaded with a bite registration material and fixed in the mouth. This gave us the opportunity to place the film holder into the same position at the annual X-ray checkup and take comparable X-ray pictures.

Pairs of lesions were generated, the first-infiltrated acted as the test lesion, while the second acted as the control. Bitewing pictures of the patient's mouth were taken for the first time on 1/21/2010 during an individual prophylaxis session.



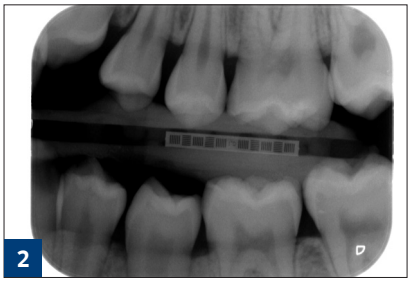
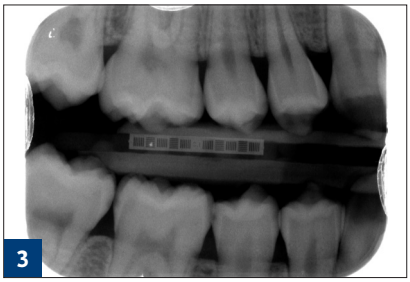


Image 1 and 2: Bitewing radiographs from 1/21/2010

On 7/11/2011, X-ray pictures were taken again during an IP1-4 individual prophylaxis session.



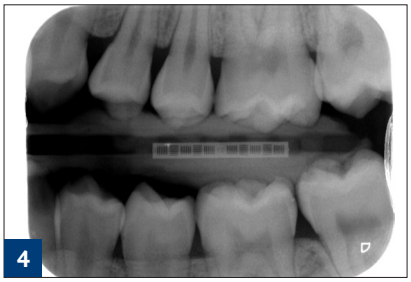
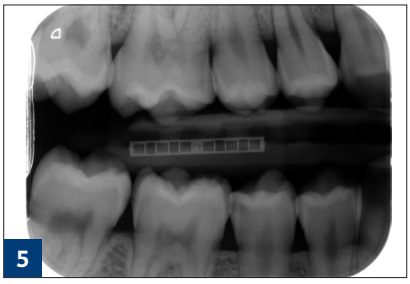


Image 3 and 4: Bitewing radiographs from 11/7/2011

The patient M.D. had four carious areas that were deemed suitable for the study. The X-ray images were sent to the study coordinator, in order to confirm whether the pairs of lesions were suitable for the study. The lesion pairs 46 distal and 16 mesial, as well as 47 mesial and 45 distal were included in the study. The lesions 46 distal and 47 mesial were infiltrated on 9/20/2011 and the lesions 16 mesial and 45 distal were left untreated, as a control group, with a mock treatment. The patient was classified as a study participant with low caries risk and scheduled for a recall appointment after 18 months.

On 10/25/2011 a single-surface proximal caries on tooth 22 received a filling.

On 7/10/2012 the patient arrived for individual prophylaxis again. During this session, a severe fear of dentists was observed for the first time. The infiltration recall was planned for the second quarter of 2013. The patient did not turn up for the arranged appointment. In consultation with the study coordinator, the patient was invited to appointments several times, but she did not turn up at them. In consultation with the patient's mother, and with her assistance, the child was able to be motivated to come for another individual prophylaxis treatment on 10/31/2013. The bitewing images showed a progression of the caries on the tooth 45 distal, but the patient refused all therapy.



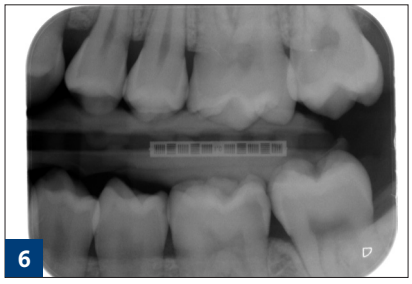


Image 5 and 6: Bitewing radiographs from 10/31/2013

The possibility of sedation with laughing gas was explained to her and on 12/12/2013 an attempt was made to treat her under laughing gas.

The patient was so overwhelmed that her very high breathing frequency could not be controlled. The treatment was broken off after a few minutes, as the patient was at risk of hyperventilating even under laughing gas. The same thing happened on 12/16/2013. However, it could be seen that the patient had more trust and that her compliance regarding caries therapy was improving.

On 2/5/2014, an occlusal-distal caries was treated with a composite filling under sedation with laughing gas on tooth 36. On 3/14/2014, tooth 45 was also treated under laughing gas and two of its surfaces (od) were restored with composite.

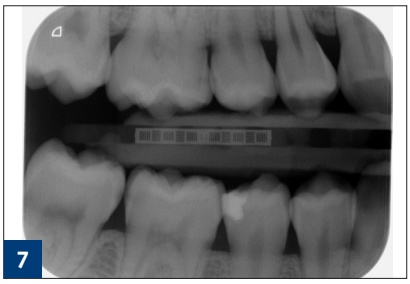
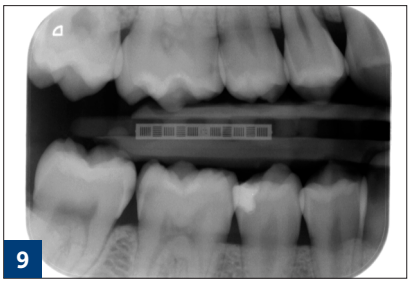


Image 7 and 8: Bitewing radiographs from 9/11/2014



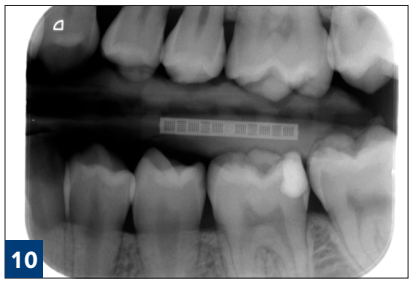


Image 9 and 10: Bitewing radiographs from 9/10/2015

Discussion

This treatment process shows, first of all, the importance of regularly taking bitewing pictures with children. In this case it could be demonstrated that in the course of time various carious lesions had a very different progression. The carious lesion on tooth 16 mesial shows no progression during the period, in comparison, to the initially rather inconspicuous E1 caries distal 45. Tooth no. 36 initially displayed no lesion and was classified as D2 in 2013. Tooth 36 is not included in the study, but it also showed a rapid caries progression.

No alteration to the infiltrated areas could be observed. However, additional initial carious E1 type lesions could be found on distal 24, mesial 26, mesial 37, mesial 36 and distal 35 in comparison to the initial diagnosis. In this case study it could be seen that the caries on the infiltrated surfaces stopped progression, while the control teeth and the other untreated surfaces show a progression.

The annual interval between control X-rays can be regarded as an appropriate time period, as changes can be established, the extent of the change tends to be moderate and there is time to plan appropriate treatment steps.

The film holders are a good and useful aid for creating reproducible X-ray images. The disadvantage is that repositioning gets more difficult with time due to the children growing and the change in position of the teeth connected with this and from time to time the encryption must be redone.

Due to the reproducibility, a variance in the quality of the bitewing radiographs was also clear, and this is likely due to the frequency of use of the X-ray films. While the quality increases with the frequency of use of the X-ray film, the amount of artifacts also increases.

Conclusion

Infiltration has shown itself to be a worthwhile step for inhibiting the progression of caries. However, regular recall is a prerequisite for documenting the success of the treatment, as well as the development of caries on other teeth, in order to be able to intervene, if necessary. Therefore the combination of regular individual prophylaxis, in combination with bitewing images, and infiltration seems to be a promising treatment route.

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