



## Case report: Treatment of a partially cavitated proximal enamel lesion with a combination of infiltration and restoration

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### Introduction

The infiltration concept (Icon) is a very useful treatment for proximal enamel lesions. But when the lesions are partially cavitated\* a rough surface will still be present after infiltration. The infiltrant does not contain any filler particles, so it will be impossible to restore the cavitation itself and get a smooth proximal area once it is cavitated. In these cases a restorative procedure with a flowable composite could lead to a better outcome.

### Diagnosis

Sem (14) was diagnosed with an E1 lesions (mesial from 26) and an E1 lesion (distal from 25) during the yearly check-up in 2019. Intra-orally we could confirm the situation on the x-ray with the microscope. Treatment for infiltration was scheduled and 5 days prior to this Sem came in for the placement of one elastic separator to create some space; essential when performing a restorative treatment after infiltration. (Fig. 1, 2)

### Infiltration

After isolation with a full rubber dam the area was cleaned with an ultrasonic scaler and a metal diamond strip. Air abrasion with aluminium oxide (29um) at a low pressure (1.5 bar) was used for final cleaning of the surface, but logically this is only possible when there is enough separation between the teeth. (Fig. 3, 4)

After cleaning the partial cavitation is clearly visible. If we were to leave this unrestored after infiltration, this would be a major plaque retentive area. We started with the infiltration treatment by etching the lesions. We used normal tips, since the lesions were in contact with each other. (Fig. 5, 6, 7)

Every etching procedure was followed by a cleaning procedure with ethanol. The ethanol should always be allowed to completely evaporate for 30-60 seconds. The hypomineralised areas should look crispy and chalky white. (Fig. 8, 9)

Infiltrant is applied and infiltration is carried out for 10 minutes. The infiltration time is prolonged compared to the manual in order to ensure the best infiltration possible. After carefully removing the access to air and suction the infiltrant was light cured for 40 seconds. (Fig. 10, 11)

### Restoration

After infiltration the partial cavitation was still visible. Note that the crispy and chalky white appearance is gone; showing that the hypomineralised enamel was completely infiltrated. Despite the fact that we carefully removed the excess infiltrant we still noticed some excess of infiltrant present after light curing. We removed the excess with scalers and metal diamond strips. To reactivate the infiltrated enamel we first etched the enamel for 30 seconds with 35% phosphoric acid. (Fig. 12, 13)

After thoroughly rinsing with water we applied a thin layer of total-etch bonding and light cured for 20 seconds before we applied a small amount of flowable composite resin. The flowable is best applied with a thin instrument like a probe e.g. The flowable is polymerised for 20 seconds and finished with finishing and polishing strips. The restoration is polymerised again for 20 seconds with some topical glycerine gel in order to attain the best polymerisation possible. The final result shows a fully restored enamel lesion with a combination of infiltration of the hypomineralised enamel and restoration of the partially cavitated lesion. (Fig. 14, 15, 16)

\*meaning that the lesion is cavitated, but only within the enamel.



Fig. 1: X-ray from 2019 with two E1 lesions visible.

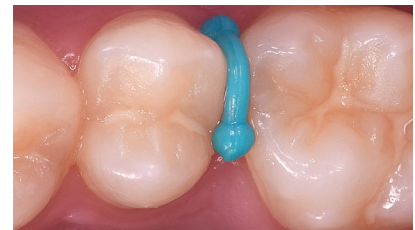


Fig. 2: Position of the orthodontic separator.



Fig. 3: Full rubber dam isolation with the help of PTFE floss ligatures.



Fig. 4: Cleaning the hypomineralised area using air abrasion with adjustable pressure.



Fig. 5: Partial cavitation was visible.



Fig. 6: Etching twice 120 seconds with 15% hydrochloric acid.

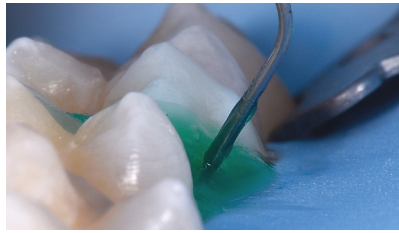


Fig. 7: We used normal tips with a metal syringe, since the lesions were in contact with each other (distal to mesial).



Fig. 8: Applying the ethanol with a normal tip with a metal syringe (25 ga).



Fig. 9: Situation after etching and cleaning; ready for infiltration!



Fig. 10: Application of the infiltrant.

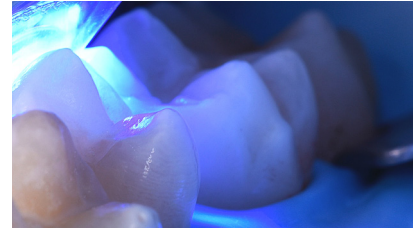


Fig. 11: Light curing for 40 seconds after removing excess of infiltrant.



Fig. 12: Situation after infiltration of the hypomineralised enamel.

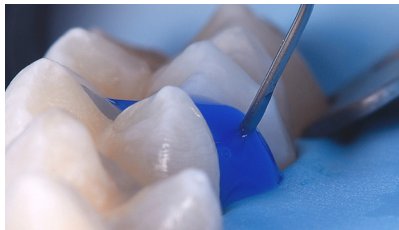


Fig. 13: After excess removal the infiltrated enamel is activated again using phosphoric acid and adhesive resin.



Fig. 14: Applying flowable composite resin to restore the partial cavitation.



Fig. 15: Final light cure with glycerine gel to get the best polymerisation possible.



Fig. 16: Situation after infiltration and restoration.

### Evaluation

When partial cavitation occurs the combination of both infiltration and restoration seem to be very useful in order to be as conservative as possible. Visual control is very important in proximal infiltration cases, because the diagnosis of a partial cavitation is carried out visually. And for easy application of flowable we require some space.

In addition to the infiltration treatment we also focused more on oral hygiene and nutrition with Sem. We were able to achieve excellent results (plaque & BOP scores <25%). This is very important, because infiltration alone will not be successful in the long term.

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