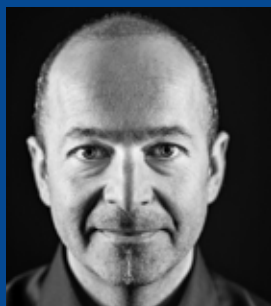




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graduated in Spain at Universitat Internacional de Catalunya in 2018. In 2020 she attended the "Course of Clinical and Surgical Micro Endodontics" held by Professor Arnaldo Castellucci. In 2022 she completed a Master Training "Conservative Adhesives Gold" held by Doctor Federico Ferraris. She is currently working in her private practice in Sicily, Italy. She is a member of the Italian academy of Conservative Dentistry and the Italian Academy of Endodontics.



**MDT Leonardo Cavallo** obtained his qualification as dental technician in 1994 in Italy. His will to improve guided him to follow Master courses in Germany and the United States. After successful completion, he returned to Italy with a different outlook to his work. He opened his first dental laboratory in 1999, where he focused on aesthetic dentistry and restorations on implants. Since 2007, he started to use digital solutions to optimize the lab's workflow. He is a member of several scientific societies, such as ESCD and ITI. His goal is to try his best to emulate the "natural beauty" of the teeth.

# Indirect restorations in case of enamel pathology.

by Dr Lorenza Stagno d'Alcontres and  
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## Introduction

Dental enamel is the hardest tissue in the human body, which forms an insulating barrier, protecting the tooth from physical, thermal, and chemical forces. The enamel tissue is acellular so it cannot remodel or regenerate.

Hence, enamel pathology is critical.<sup>1</sup> During enamel formation, the organic enamel protein matrix interacts with calcium phosphate minerals to form enamel apatite crystals. The enamel protein matrix consists of unique enamel proteins which are secreted by highly specialised cells called ameloblasts.<sup>2</sup>

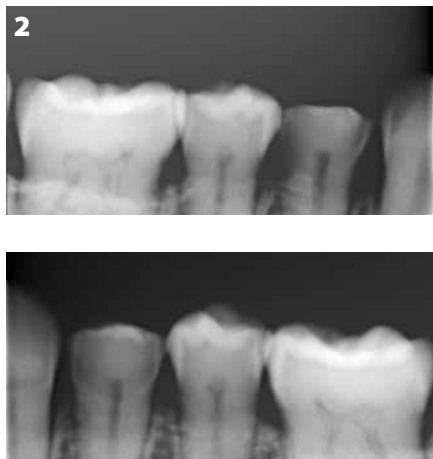
Enamel defects may be caused by a variety of interacting factors ranging from genetic defects to environmental insults.<sup>3</sup> If an insult occurs during enamel matrix secretion, hypoplastic defects are likely to result, in contrast to an insult occurring during the mineralization stages which usually produces hypomineralisation defects. As several teeth in the mouth are undergoing different stages of enamel

formation at the time of an insult, it is possible that a spectrum of effects may be evident on different teeth, and even on a single or a few teeth.<sup>4,5</sup>

In this case report, an adult patient presented an enamel surface damage in the two mandibular premolars. After a detailed anamnesis of the patient, extrinsic or other environmental factors were excluded. (Fig.1-2) The treatment choice was based on the high aesthetic demand of the patient and the total coverage of the enamel deficit area.



**Fig. 1:** Occlusal view on the mandible. The lower first premolars show a quantitative enamel defect, classified as enamel hypoplasia. The enamel on these teeth is thin to absent.



**Fig. 2:** The lack of enamel was also evident on the radiographies.

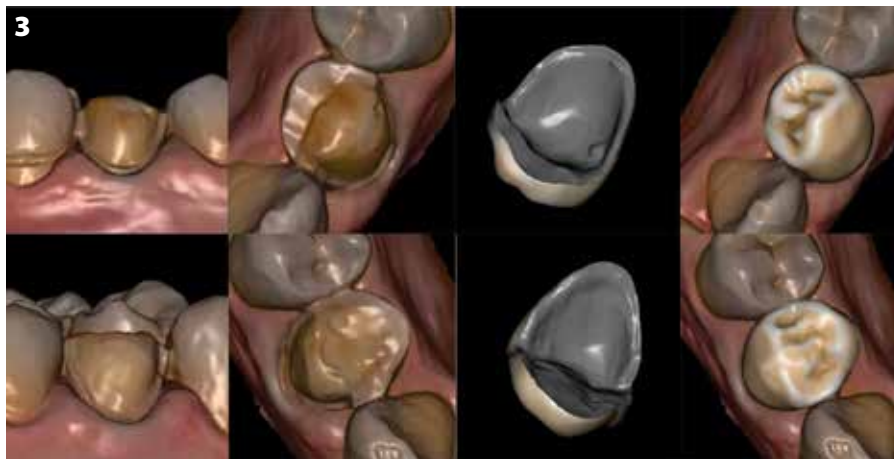
## Treatment

After having discussed the treatment options with the patient, it was decided to make two overlays from lithium disilicate ceramic (Initial LiSi Press, GC). The morphology of the preparation was defined following the adhestetics protocols (PIAR).<sup>5</sup>

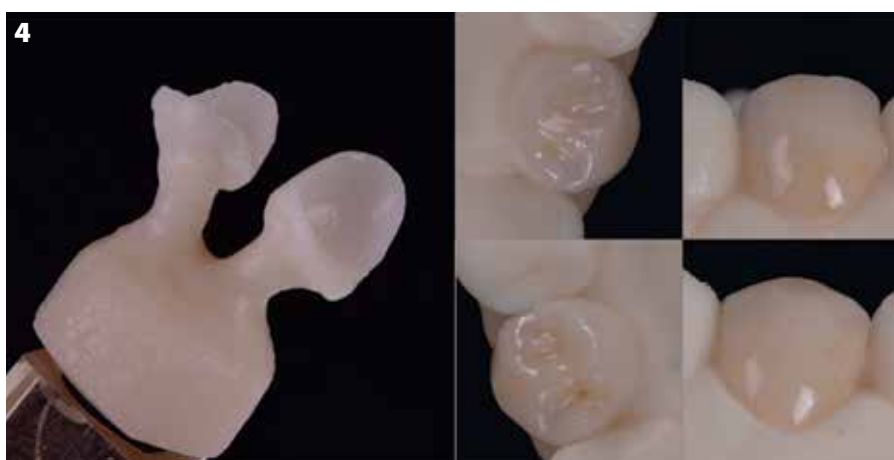
The first step was an occlusal preparation with a butt-joint; next, a 0.3-mm chamfer was prepared in the cervical area. (Fig. 3) While the portion of residual enamel in the vestibular area enabled ideal cementation, in the occlusal area, due to the absence of enamel, an immediate dentine sealing (IDS) was performed with a 3-step etch-and-rinse adhesive<sup>6,7</sup> to improve bond strength. The procedure was followed by a digital planification.



**Fig. 5:** Prior to the adhesive procedures, the teeth were isolated using rubber dam



**Fig. 3:** From preparation scan to computer-aided design of the Initial LiSi Press overlays.



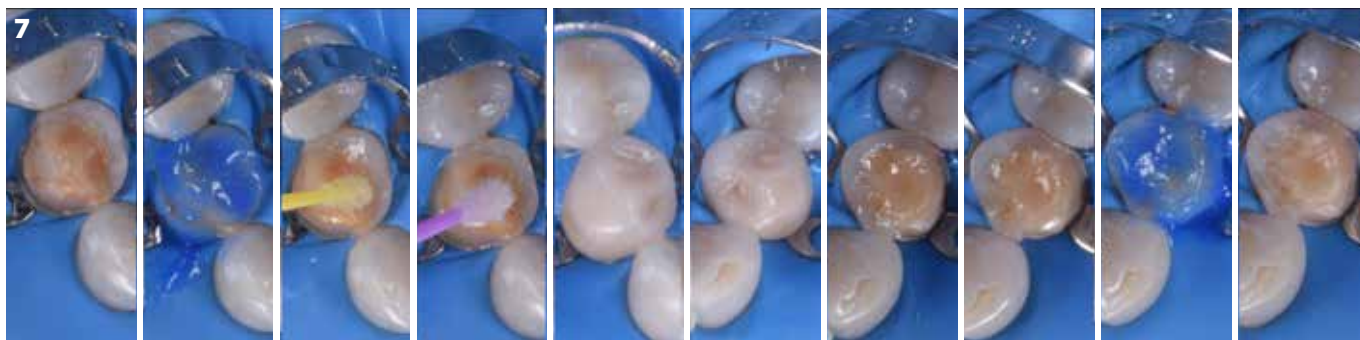
**Fig. 4:** The preparation of the Initial LiSi Press overlays.

In the lab, the overlays were manufactured from pressable lithium disilicate (Initial LiSi Press). The high density micronisation of this lithium disilicate gives the restoration a lifelike natural beauty and sufficient strength. (Fig. 4)

In the second appointment, rubber dam was applied prior to the adhesive procedures<sup>5</sup> (Fig. 5).



**Fig. 6:** Like for all lithium disilicates, restoration pretreatment of Initial LiSi Press restoration entails a 20-s etching with HF during 20s.



**Fig. 7:** A selective enamel etch approach was chosen, which is well-supported in the scientific literature.

### Restorative surfaces pretreatment

(Fig. 6)

- 5% hydrofluoric acid was applied for 20 sec. in accordance with the instructions for use.
- 37.5% orthophosphoric acid was applied for 30 sec. for cleaning the surface from organic residues.
- Ultrasonic bath for 2-5 min with alcohol
- Silane application for 60 sec.
- Universal adhesive (G-Premio BOND) was rubbed for 30 sec, and dried on the restoration surface. No adhesive polymerization is needed in this phase.

### Dental surfaces pretreatment (Fig. 7)

- 37.5% orthophosphoric acid was selectively applied on the enamel contour for 30 sec., rinsed and dried.
- Universal adhesive (G-Premio BOND) was rubbed on enamel and dentine, dried and polymerised for 30 sec. in accordance with the manufacturer's instructions.

### Cementation

A light-cure flowable composite was used for cementation. Sufficient



**Fig. 8:** Radiographic control showed optimal seating without presence of overhang

pressure was applied on the restoration to expel the composites excess prior to the clean-up and polymerisation. The margins were carefully polished to leave a smooth surface.

Radiographies were made to ensure proper seating of the restorations and to ensure the absence of overhangs (Fig. 8).

At the follow-up consultation after one month, the patient indicated that he was very satisfied. The restorations looked very realistic and the margins were seamlessly integrated (Fig. 9).

### Conclusion

Adhesive indirect restorations are a great source to manage clinical situations such as enamel defects in a



**Fig. 9:** The Initial LiSi Press overlays at one-month follow-up.

minimally invasive manner. Due to the adhesive nature, the retention and resistance form of the restoration are less important, which enables us to preserve more tissue.

Every case needs diagnosis, treatment planification and a tailored approach. In case of dentinal exposure, IDS has a positive influence on the long-term survival of indirect bonded restorations.

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