The importance of dentofacial attractiveness for the psychosocial well-being of an individual is well established. An attractive smile has always been the focal point of a person’s attention. Currently, more people attempt to improve their aesthetic appearance and thus their self-esteem, because they know it might lead to better social acceptance. To understand why a smile with dentition in harmony is considered beautiful, it is necessary a visual perception to the dental environment. The six anterior superior teeth play an important role in this specific issue. It is the contrast of shape, colour, line and texture that enable us to differentiate one tooth from another, the teeth from the gingival tissues, and the smile from the face.

When facing ectopic maxillary canines, for example, an orthodontic treatment should be considered. Although the orthodontist is able to place the canines in the most aesthetic and functional location, generally at least 2 years and 10 months are required for an orthodontic treatment. Sometimes, due to the restorative dentistry development, an alternative option can be considered. In order to recreate normal canines shape, position and colour, porcelain veneers or crowns are the solution, but a composite resin restoration is also possible.

The delivery of functional, aesthetic restorations has been simplified by the introduction of contemporary composite materials. The new nanocomposite materials offer better aesthetics, strength and durability, combining scientific principles for increased longevity.

The aesthetic influence of gingival architecture on symmetry and tooth length as it relates to the “smile line” can be altered through periodontal surgical techniques. The practitioner can influence
the appearance of the smile by correcting tooth length problems as they relate to upper lip line and correction of right-to-left asymmetries.\(^8\) In addition, proper evaluation and diagnosis of the gingival architecture and lip lengthening lead to a reliable treatment plan that provides a more aesthetic perception to view the oral space.\(^9,10\)

The purpose of this article is to present an alternative solution to orthodontic treatment and periodontal surgical procedures in a clinical case of ectopic maxillary canines. A conservative aesthetic restoration technique with a nanohybrid resin composite, Grandio (VOCO, Cuxhaven), is presented to restore maxillary canines morphology and position. In addition, to precisely transfer the soft tissue, the gingival tissue, morphology from the exposed cervical area to the working cast, we used a light-curing gingival-shaded compomer, Comp Natur (VOCO, Cuxhaven).

**Clinical case of ectopic maxillary canines direct aesthetic restoration**

A 43 years old female patient appeared in the dental office, not pleased with her smile (Fig. 1), related to the position of the anterior teeth. The diagnosis revealed caries lesions in the mesial and distal surfaces of teeth 2.1 and in the mesial surfaces of teeth 1.1 and 1.2. In addition, the tooth 2.2 was diagnosed agenesis, an ectopic localization of the maxillary canine teeth (Fig. 2), and a gingival retraction associated to the dislocated positions in the arches of these teeth (Fig. 3). After the study of the smile line and occlusion, the patient was presented with the treatment options: the possibility of orthodontic and periodontal rehabilitations with the purpose of re-establishing the maxillary canine position in the arch and the associated gingival architecture in that region.

Due to time and economic limitations, various alternative solutions were proposed to the patient. A conservative aesthetic composite direct restoration to rebuild the canine morphology and position was the patient’s choice.

The nano-hybrid composite, Grandio (VOCO, Cuxhaven) was used for the tooth and a compomer, Comp Natur (VOCO, Cuxhaven), was used to mask the gingival tissue morphology from the canine cervical area.

Grandio (VOCO, Cuxhaven) is a nano-hybrid composite and it was selected because it combines good physical, mechanical and aesthetic properties. It has a significantly lower polymerization shrinkage than conventional composites (1.57% VCC), related with the high particle incorporation ceramics, that reach a proportion of 87% by weigh. Grandio (VOCO, Cuxhaven) also has good consistency and very good handling characteristics, is smooth and does not slip, it stands in place and almost never sticks to the instrument. This nano-hybrid composite provides good options for the restoration shade selection, dentine and/or enamel, since it is available in 16 shades (including one incisal and two opaque shades).

Comp Natur (VOCO, Cuxhaven) is a restorative compomer indicated to mask exposed, discolored or hypersensitive cervical areas, especially in long teeth of the visible anterior area, and class V restorations, namely cervical caries, cervical or root erosions and fracture or abrasion lesions where the gingivo-incisal width is excessive.
The patient selected this treatment plan because it consists of a technique that demands only one office session, it was a good conservative rehabilitation alternative (not limiting the possibility of other kinds of solution in the future) and also because it was economically accessible. After the signature of the inform consent, casts and wax-up preparations were done to visualize the ideal canine size and shape and the aesthetic commitment involved in order to evaluate its feasibility.

The upper incisive (colour A2) and the upper canine (A3 and A2) shades were selected in natural day light using the Grandio system shade scale (VOCO, Cuxhaven). The gingival shade of the upper canine region (opaque white and nature) was selected using the Comp Natur system shade scale (VOCO, Cuxhaven).

**Caries restorative treatment**

After isolating the operating area with cotton rolls, a spherical diamond rotary instrument with high rotation and cooling was used to prepare and shape the cavities in teeth 2.1, 1.1 and 1.2 (Fig. 4 and 5). Then a spherical tungsten rotary instrument with medium rotation and cooling was used to remove the carious tissue and finish the cavity preparations in the mesial and distal surfaces of the tooth 2.1 and in the mesial surfaces of 1.1 and 1.2. An acetate matrix band was applied in the proximal spaces on each prepared cavity, one at a time, with two layers of a 6th generation (type II) self-etching adhesive system, nanoparticle reinforced Futurabond NR (VOCO, Cuxhaven), to achieve uniform and brilliant cavity surfaces. The application of this adhesive system consisted of mixing an acid-based primer and adhesive (2 bottle system) for 5 seconds, the application on the cavities surfaces, drying with soft air jet for 5 seconds and subsequent light curing, with a blue light emitting diode (LED), Celalux (VOCO) at about 1000 mW/cm² for 20 seconds. All cavities had been restored (Fig. 6), according to layer technique with the nano-hybrid composite, Grandio (VOCO, Cuxhaven), and light-cured for 20 seconds for both vestibular and lingual aspects.

Conventional finishing and polishing techniques were performed with laminated carbon tungsten burs, rubber cups and disc-shaped felt instruments.
Aesthetic canine odontoplasty

Restorative dentistry can change the position and morphology of teeth to restore a functional and aesthetic occlusion. First, the mandibular incisal edge position should be considered. Afterwards, the relationship of the maxillary anterior teeth to the lips, mandibular incisors, canines and the whole dental arches is examined. When the three major determinants of incisal edge position (occlusion, phonetics and aesthetics) are used to place the anterior teeth where they will work better, all clinical cases have the potential for more aesthetic success. 

When maxillary canines are displayed, the patient’s primary concern is usually aesthetics. Depending on the patient’s smile line and the display of the canines, the aesthetic zone may extend to the entire clinical crown and include the surrounding soft tissue. In restorative dentistry, attention is first paid to the tooth tissue (translucency, opalescence, and transparency) and shade characteristics to clearly identify the value. Moreover, the position of the lower lip line as well as the symmetry of the smile should be considered. In addition to these fundamental objective criteria, subjective criteria such as tooth arrangement and position, variation in tooth form, relative crown length, and the aesthetic principles of proportion, play a part in the successful occlusion and phonetic integration of an aesthetic resin composite restoration.

Before all the aesthetic restorative proceedings, a try-in restoration with selected resin composite shades and no adhesive technique was performed considering the previous wax up. At this time the patient still had a chance to discuss some size, shape and shade alterations she wanted to have. After patient consent was received, the aesthetic proceedings were started.

First, a cylindrical diamond rotary instrument was used with high rotation and cooling to obtain a rough enamel surface, without removing a significant amount.

Afterward, an aesthetic non invasive restoration of the vestibular gingival tooth area was performed. By means of a pre-etch technique, the phosphoric acid 37% gel (Vococid, VOCO) (Fig. 7) was applied for 30 seconds on the 2.3 tooth enamel surfaces (vestibular and lingual), and then removed with water. This left the dental surfaces with an opaque white aspect for
the application of the adhesive system. This technique allows the reduction of bacterial plaque of the uncut enamel surfaces, before applying two layers of the self-etch adhesive system, Futurabond NR (VOCO, Cuxhaven), to improve the bond strength. After these procedures, the enamel surfaces of the 2.3 tooth exhibited a uniform and brilliant feature. One layer of the Comp Natur system (VOCO, Cuxhaven) was applied on the cervical third surfaces of the 2.3 tooth and light cured, with Celalux (VOCO) at 1000 mW/cm² for 20 seconds. The compomer shade was used to simulate the gingival tissue in shape and contour. With this material, the gingival architecture and contour could be masked in accordance with the upper anterior teeth gingival line (Fig. 8). Later, the same procedure was done in tooth 1.3.

Then, in the vestibular and palatine surfaces of the 2.3 cervical and medium third tooth, one layer of the nano-hybrid composite, Grandio (VOCO, Cuxhaven) A3 shade was applied and adapted. The A2 shade was used for the cusp restoration of the same tooth. After good adaptation and sculpture, this single layer of Grandio (VOCO, Cuxhaven) was light cured for 20 seconds on the vestibular and palatine surfaces. The same protocol was applied for the restoration of the 1.3 tooth (Fig. 9).

The tooth characterization regarding position and morphology was done, and then occlusion verified with precision to deliver a functional and aesthetic occlusion (Fig 10) to improve the smile line (Fig 11). The application of the dental floss in the proximal occlusion (Fig 10) to improve the smile line (Fig 11).

**Conclusion**

Because of the aesthetic and functional importance of the maxillary canines in the oral balance, therapeutic orthodontic alignment and periodontal rehabilitation should be indicated in ectopic maxillary canines.

The evaluation of aesthetics needs is different from one person to another and from one dental professional to another. Clinicians should evaluate specific patient needs and conditions, presenting all different alternative viable techniques.

This paper describes a non invasive restorative dental procedure that masks the gingival morphology, allows the dental professional to restore the upper canines shape, position and relative crown length, and harmonize it with the adjacent soft tissue. The selection of a nano-hybrid composite in this restoration contributes to aesthetic, mechanical advantages leading to a more aesthetic smile.

The simple principles of visualization perceptions with the dental environment and restoration treatment options can be successfully applied in restorative dentistry to achieve optimal tooth aesthetics and enhance the smile of any patient.

**REFERENCES**


**ABOUT THE EXPERTS**

Patrícia Manarte Monteiro*; Joana Domingues*; Liliana Teixeira*; Paulo Melo**;
*Assistant Professor, Department of Operative Dentistry, Faculty of Health Sciences, Fernando Pessoa University, Porto, Portugal
** Associate Professor and Chair, Department of Operative Dentistry, Faculty of Health Sciences, Fernando Pessoa University, Porto, Portugal