Introduction

Excluding the third molars, the agenesis of the upper lateral incisors is unfortunately second only to the agenesis of the second bicuspids, with a prevalence of about 1-1.5% [Mattheeuws et al., 2004; Polder, 2004; Celikoglu, 2011]. The development of permanent teeth in children with dental agenesis is delayed when compared with normal patients. The current treatments found in the scientific literature, such as anterior space closure with canine replacement [Kokich Jr, 2005; Brough, 2010; Rosa, 2010] or anterior space opening with implant placement [Krassnig, 2011], have their own peculiar advantages and disadvantages [Kavadia, 2011; Uribe, 2011; Park, 2011].

The purpose of this study is to apply a new methodological and clinical approach for the treatment of upper lateral incisors agenesis, a new “Third Way” able to safeguarding the occlusal integrity and the dental and periodontal aesthetics of the front teeth, with the advantages [Mirabella, 2011] of previous techniques and without their drawbacks.

Material and methods

This new approach was conceived by means of the anterior space closure, with mesialisation of the canine and the bicuspids, if necessary aided by mini-implants, combined with posterior space opening to create adequate room for the placement of an implant in the second premolar area.

Usually the patient presents the following conditions at baseline (Fig. 1, 2, 3).

› Mono- or bilateral agenesis of maxillary lateral incisors.
› Class I molar relationship with tendency toward Class II.
› Skeletal Class I, normodivergent.
› Normal overjet.
› Increased overbite.

Treatment

The first phase of the treatment consists in applying a fixed orthodontic appliance in order to obtain the mesialisation of the canines and the bicuspids, along with the distalisation of the molars if necessary. This objective can be obtained by means of an elastic chain, compressed springs between premolars and second molars, and springs between miniscrews and Power Arm.
In case of upper lateral incisors agenesis, second bicuspids are often rotated [Arte, 2001]: this condition can be corrected using an elastic chain between a palatal button on the second premolar and the bracket on the first premolar, or between the bracket on the second premolar and a miniscrew placed buccally [Favero, 2010; Favero, 2009; Favero, 2002; Antoszewska, 2010] (Fig. 5).

At the end of the orthodontic phase [Garino, 2003], anterior space closure and posterior space opening are obtained. The space is opened in the second premolar
area and it is sufficient for implant rehabilitation (Fig. 6, 7).

After this, the space obtained must be maintained with a space retainer or a provisional Maryland bridge, until the patient is old enough to undergo implant therapy, and the canines must be reshaped into lateral incisors. Finally, when the patient is old enough, an implant can be placed in the second premolar area and the final prosthetic crown can be made.

Results

The results of this new approach are a correct teeth alignment without diastema, Class I occlusion, and occlusal integrity with all natural teeth in the anterior area, with lower risk of aesthetic periodontal consequences compared to implant therapy in the maxillary lateral incisor area [Furze, 2012; Belser, 2004] (Fig. 8, 9, 10), with better long-term outcomes and stability.

Conclusion

The advantages of this new methodological and clinical approach can be found in the synergic use of the two main treatments for congenitally missing upper lateral incisors, that have always been used antithetically. The new approach has many advantages for the patient:

› Preservation of all natural teeth in the aesthetically relevant anterior area: implant rehabilitation is not performed at the lateral incisor area, since canines and premolars are mesialised and reshaped.

› Highly aesthetic and stable dental and periodontal results, which are obtained at the right moment of the orthodontic treatment, with: presence of natural teeth in the front area, orthodontic correction of the gingival pattern and reshaping of canines and bicuspids warrant a very good aesthetic result.

› The implant and crown are placed in the posterior area, which is less aesthetically relevant, therefore the possible consequences of the implant therapy (bone resorption, gingival recession, periimplantitis, implant loss) have a lower impact.

› Occlusal integrity and symmetry are maintained, which cannot be achieved with the sole anterior space closure technique.

› In the posterior area the interradicular space is usually sufficient for implant surgery. Instead with the anterior space-opening techniques, the proinclination of the frontal teeth to open the space for the implant and the crown causes loss of the interradicular space. As a consequence, if the maxillary basal bone is not sufficient, it is sometime impossible to place an implant in such position.

› Bone volume is maintained by the presence of natural teeth and implant all around the arch perimeter.

› Low biological costs: permanent damage to the hard structures of the teeth are limited to minor reshaping of the canine and the first premolar.

This new method can be considered an effective approach [Favero, 2009] for the treatment of congenitally missing upper lateral incisors.

References


Mirabella AD, Kokich VG, Rosa M. Analysis of crown widths in subjects with congenitally missing maxillary lateral incisors.


