CLINICAL CASE: Axiom® PX / Axiom® 2.8

AGENESIS OF MAXILLARY LATERAL INCISORS

Two cases managed with Anthogyr Axiom® 2.8 and Axiom® PX implants.

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The absence of maxillary lateral incisors creates major aesthetic and functional problems due to their location in the aesthetic zone.

In adolescent patients, the possible options are space maintenance and replacement of the missing teeth, or orthodontic space closure with canine substitution.\(^9,13,14,15\)

Proper recontouring or reshaping of the canines after removal of the orthodontic appliances greatly improves the aesthetic outcome.\(^19\)

There are also adult patients who have gone untreated, and at some time in their lives are confronted with this problem. We see quite a lot of such cases.\(^12\) We are presenting here two distinct clinical cases.

**Clinical case n°1**

An 18-year-old female patient with a bilateral agenesis of the maxillary lateral incisors was referred to us by a colleague, Dr G. Prost. He had started orthodontic space opening treatment when the patient was 14 years old.

Agenesis is often associated with bone hypoplasia, which results in insufficient bone volume due to the presence of thin concave ridges.\(^18\)

Thanks to the Axiom\(^\text{®}\) 2.8 implant (Anthogyr), a distance of 1.5 mm can be maintained between the implants and the adjacent teeth.\(^16\) But above all, it avoids the need for a two-stage surgery with a first stage for bone healing, and a second stage several months later for placement of the implants.

Fig.1: Panoramic X-ray taken at the end of the orthodontic treatment with the retaining wires in situ.

Fig.2: Clinical view prior to surgical treatment.

Fig.3: A removable prosthesis was used until jaw growth was completed.

Figs.4a & 4b: Lateral views showing the spaces achieved with the orthodontic treatment.

Figs.5a & 5b: Accurate measurements of interdental spaces are made on CBCT (cone beam computed tomography) reconstructions.

Figs.6a & 6b: As it was anticipated during clinical examination, it would not be possible to use standard implants without prior bone reconstruction.
Anthogyr recommends a subcrestal positioning of the implant, so as to enhance aesthetics of soft tissues.

Owing to the small diameter of the implant, placement is easy. However, bone apposition is mandatory to preserve the peri-implant tissue and ensure a long-term aesthetic outcome.

**Fig.9:** Xenograft using bovine origin material (Cerabone®).

**Fig.10:** Graft is covered with a collagen membrane (Jason®).

**Fig.11:** Graft fills completely the bone defect.
Figs. 12a & 12b: PEEK healing plugs allow soft tissue conditioning.

Fig. 13: Two provisionals were placed at 2 months postop.

Figs. 14a & 14b: A zirconia power burr was used to adjust the collar height of #12 to that of #22.

Fig. 15: Panoramic X-ray taken at 1 year postop.

Fig. 16: The appearance of gum tissue at implant sites is indicative of the quality of the result. The ceramic crowns were fabricated by Laboratoire Pinsard.
Fig. 17: The wonderful smile of this young patient speaks for itself!

In such a case, multidisciplinary team coordination is essential to define the most appropriate treatment plan and most effective workflow. Implant selection is crucial. The Axiom® 2.8 implant (Fig. 18) is specially designed for use in the incisor region, in cases of restricted mesiodistal space or low bone volume. Both the implant and the prosthetic components have a 2.8 mm outside diameter. The unique “two-part” design of this implant provides optimal intraoperative flexibility. In particular, it makes it possible to cement the crown ex situ. Platform-switching offers the advantage of preserving hard tissue\(^1,2,6,8\). The Morse taper connection with its 1.5° and 4 mm length angle ensures a tight bacterial seal. It prevents bacterial accumulation at the implant-abutment interface which is responsible for local inflammation\(^4\). This unique connection facilitates accurate positioning of the abutment and offers superior mechanical strength\(^7,10\).

The SafeLock® calibrated instrument (Fig. 19) guarantees fully controlled and reproducible impaction of abutments. Abutments are available in four gingival heights (1, 2.5, 4 and 5.5 mm) and four angulations (0°, 7°, 15°, and 23°). Temporary abutments and healing plugs are available in four gingival heights (1, 2.5, 4 and 5.5 mm). A cover plug has been designed for use in two-stage surgeries.

Clinical case n°2

A 60-year-old female patient with agenesis of the maxillary lateral incisors and retention of primary canines complained of severe mobility of her canines. Fig. 20: The maxillary canines are substituting for the lateral incisors. Besides, primary teeth are not only mobile but also highly deteriorated.

Fig. 21: Radiological examination of the maxillary arch shows significant resorption of primary teeth roots.

Figs. 22a & 22b: Mobility and severe damage to the primary canines are obvious.

Fig. 22a

Fig. 22b

Fig. 23

Fig. 24

Fig. 25
At least, the primary canines had preserved the bone volume so that immediate post-extraction loading of the implants could be considered\(^{11,17}\).

We selected two 4x14 mm Axiom\(^{\text{®}}\) PX implants [Anthogyr] [Fig. 23]. Axiom\(^{\text{®}}\) PX implants are specially designed for these situations and provide optimal anchorage.

In case of flapless surgery, as in this case report, a radiograph is essential to ensure the fit of the pillar and bone remodeling is sometimes necessary as it was the case for the 22 [Fig. 24b]. The fit of the abutment of the implant placed in 12 was good [Fig. 24a].

Figs. 25a & 25b: Placement and immediate loading of provisionals helped preserve the integrity of gum tissue\(^5\). They were placed out of occlusion and the patient was happy with a new bright smile right after the procedure.

Figs. 26a & 26b: Ceramic crowns were placed at 4 months postop. At this stage, it is still possible and rather easy to recontour the canines to a more ideal lateral incisor shape and size by using composite resin buildups or porcelain veneers. In the present case, the patient did not feel the need to. Ceramic crowns were fabricated by Laboratoire Bienfait.

Figs. 27a & 27b: Control X-rays taken at 1 year postop show good bone stability.

Fig. 28: Panoramic view at 1 year postop.

Fig. 29: Good functional and aesthetic outcome was achieved with minimal surgical invasiveness.

As for CASE 1, implant selection was an important determining factor for successful outcome. The Axiom\(^{\text{®}}\) PX implant [Fig. 23] is specially designed for immediate post-extraction placement and low-density bone. Its symmetrical double threads [self-drilling and self-tapping] and conical shape are key to easy insertion and optimal anchorage in bone. Its reverse conical neck contributes to preservation of cortical bone and remodeling of alveolar bone.

It uses the same surgical kit as the Axiom\(^{\text{®}}\) REG implant [Fig. 30]. Thanks to their unique connection system, Axiom\(^{\text{®}}\) REG and Axiom\(^{\text{®}}\) PX implants are compatible with the full range of dental restorations. Constant emergence profile is maintained from the healing screw.
or temporary abutment to the permanent abutment, which guarantees perfect fit to soft tissue. In this patient, primary anchorage strength (over 30 N.cm) was sufficient to allow immediate loading17.

**Conclusion**

In patients with agenesis of maxillary lateral incisors, when it comes to choose the most appropriate treatment, only two options are available. One option is orthodontic closure of the spaces and substitution of the missing teeth with canines, and the second is to open or maintain the spaces for placement of implants. The need for prior bone reconstruction seems to be the main factor that may work against the implant solution.

With its small diameter and unique connection system, the Axiom® 2.8 implant expands the indications and above all, it greatly facilitates the procedure. The Axiom® PX implant is the ideal solution for patients who meet all the criteria that make them eligible for immediate post-extraction implant placement.

By providing a strong, reliable anchorage, the Axiom® PX implant permits immediate loading in a large number of cases.

**Fig. 30:** Surgical kit for Axiom® REG/PX implants.

**References**


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*Photos credit: Dr F. Bailly - Anthogyr*