

Pre-Surgical Orthodontic Moulding: Description of an Alternative Technique

Modelado Ortodóntico Pre-quirúrgico: Descripción de una Técnica Alternativa

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ABSTRACT: Pre-surgical orthodontic moulding is one of the most common procedures carried out in clinical orthodontics for preparing those patients to be submitted to orthognathic surgery. In order to optimise such a procedure in terms of time, the authors describe a new moulding technique using utility wax. In this way, dental occlusion can be moulded quicker and more precisely, thus optimising the treatment of these patients.

KEY WORDS: Orthodontics; Surgery orthognathic; Impression; modelling.

INTRODUCTION

The term "orthognathic surgery" refers to an intervention consisting of osteotomy techniques aimed at correcting maxillary discrepancies in the masticatory system by achieving a balance between face and skull (Ribas *et al.*, 2005; Arnett *et al.*, 1996). The maxillo-mandibular relationship corrected by orthognathic surgery will favour masticatory function, speech, breathing, and facial aesthetics (O'Dowling, 2008; Wolford *et al.*, 2008; Lye, 2008; Marsan *et al.*, 2009).

Prior to the orthognathic surgery, however, it is necessary to perform an orthodontic preparation in order to eliminate the dental compensations caused by the muscles, thus promoting harmony between teeth and bones of the maxilla (Medeiros & Medeiros, 2004; O'Dowling; Wolford *et al.*; Lye; Marsan *et al.*).

During the orthodontic preparation, orthodontic moulding is frequently needed (Camargo & Mucha, 1999) because the analysis of the dental intercuspidation is not possible due to the skeletal malocclusion (Medeiros & Medeiros).

In the final phases of orthodontic preparation, such dental mouldings become very common in all

visits because they help the practitioner visualise what should be done to better adjust the orthodontic appliance (Medeiros & Medeiros).

The objective of the present study is to describe an alternative technique for moulding the dental occlusion during orthodontic preparation of patients to be submitted to orthognathic surgery.

CLINICAL MOULDING PROCEDURES

Evaluating the occlusion. Firstly, the dental occlusion to be prepared for orthognathic surgery should be evaluated (Fig. 1). In case of isolated occlusal imbalances in relation to dental arches, these should be corrected prior to the correction of the inter-arch relationships for which a previous moulding is needed for visualisation.

Wax impression of the occlusion. The bite-impression in wax should be performed prior to the moulding in order to avoid procedural errors due to muscular fatigue and to allow the orthodontist to observe the patient's occlusion so that he or she can com-

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Fig. 1a. Intra-cranial photograph – frontal view.

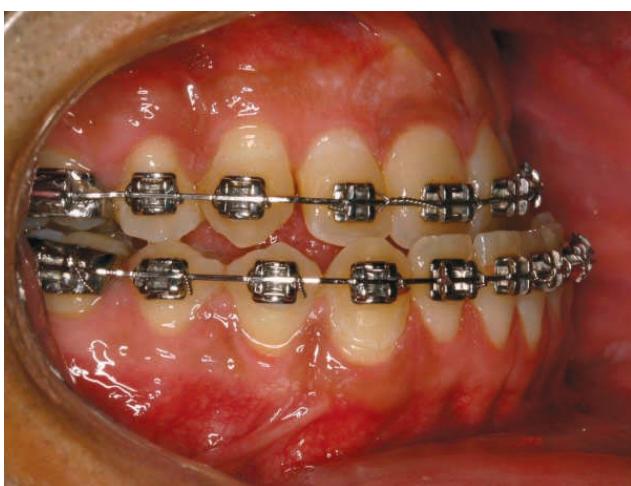


Fig. 1b. Intra-cranial photograph – right lateral view.



Fig. 1c. Intra-cranial photograph – left lateral view.

pare it to the upper and lower plaster moulds correctly. The impression should be done in a centric relation (CR) position, but this is not always possible. In this case, it is necessary to obtain maximum habitual intercuspidation (MHI) for impression (Romano *et al.*, 2005).

For such a procedure, utility wax and alcohol lamp, or a portable torch, are used. Initially, wax and fold are plastified in order to increase its rigidity (Fig. 2). Next, the arch contour are delimited by gently

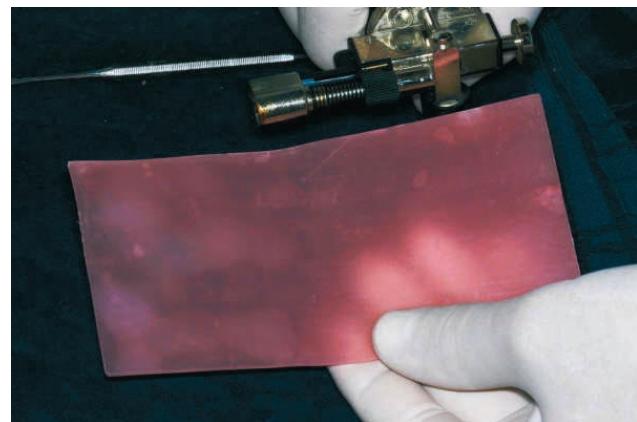


Fig. 2a. Torch for heating the wax.

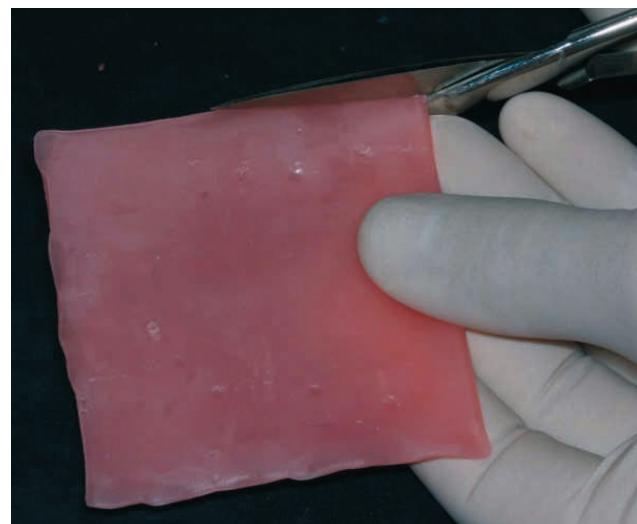


Fig. 2b. Removal of excess wax.

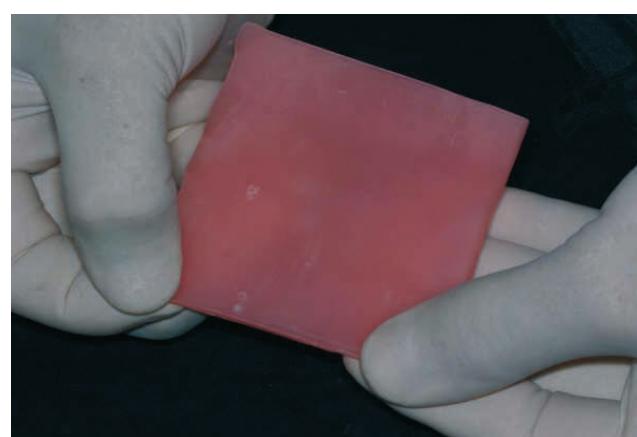


Fig. 2c. Plastification of the wax.

pressing it against the upper arch, and the excess wax is removed with a pair of scissors (Fig. 3) and the resulting impression is plastified again (Fig. 4).



Fig. 3a. Obtaining the impression of the upper dental arch.

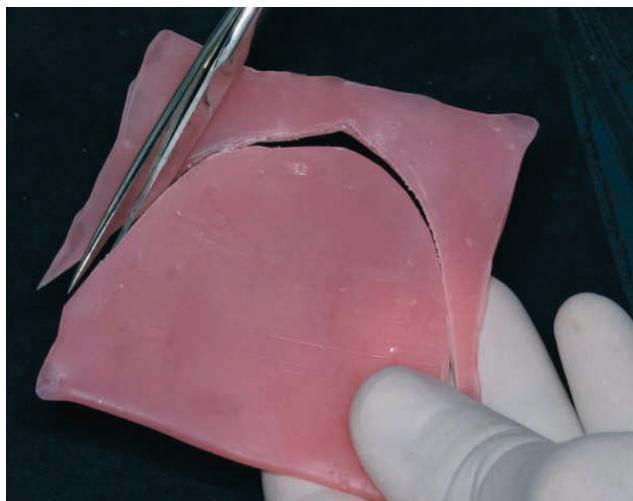


Fig. 3b. Removal of excess wax to mould the arch.



Fig. 3c. Final impression of the upper arch.



Fig. 4a. Impression being adjusted to the upper arch.



Fig. 4b. Bite-impression in wax.

Utility Wax Moulding. This moulding procedure is performed with a 5-mm layer of utility wax. Initially, the wax should be delimited by the contour of the arch to be moulded by gently pressing the wax against the teeth (Fig. 5). Following this impression, the excess wax should be removed by using a Lecron spatula or snap blade knife (Fig. 6).

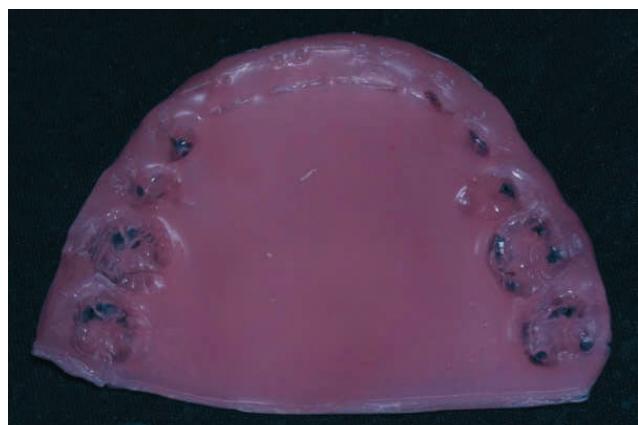
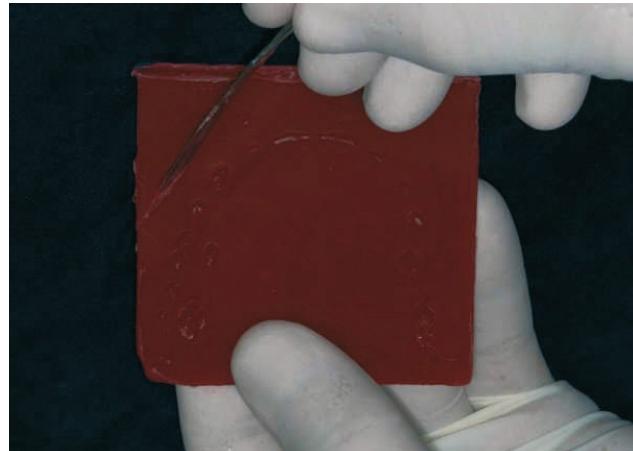


Fig. 5. Impression of upper and lower arches.



Figs. 6a-c. Adjusting the wax for moulding the upper arch.

Once the excess wax is removed, the wax should be plastified by softening it so that the wax can be moulded (Figs. 7 to 15). Following plaster crystallisation, the casts are removed from the moulds (Fig. 16) and the excess removed with a snap blade knife.

Cast Manipulation. The casts are manipulated with the hands, and in this phase, the correction of the

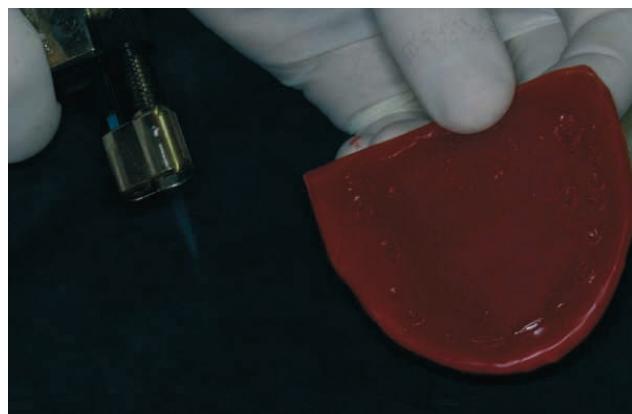


Fig. 7. Plastification of the upper arch wax.



Figs. 8a, b. Upper arch moulding.



Fig. 9. Mould positioned in the upper arch.

skeletal discrepancy is simulated so that the occlusal relationships can be analysed according to the new position to be achieved after surgery (Fig. 16).



Fig. 10. Removal of upper arch mould.

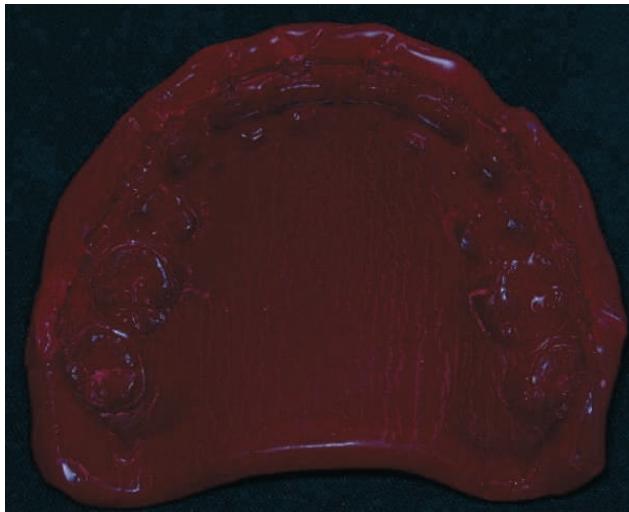


Fig. 11. Obtaining upper arch mould.



Fig. 12. Moulding the cast.



Figs. 13 a, b. Inserting moulding tray into the lower arch.

FINAL CONSIDERATIONS

Because pre-surgical orthodontic moulding is a common procedure for preparing orthodontic patients prior to orthognathic surgery, it should be performed quickly and precisely. The technique described above is thought to have these characteristics as chair time is reduced and visualisation of occlusal relationships is satisfactorily achieved.



Figs. 14a-c. Upper arch moulding.



Fig. 16. Casts obtained.



Fig. 15. Upper-lower cast.



Figs. 17a, b. Manipulation of the casts obtained.

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RESUMEN: El modelado pre-quirúrgico en ortodoncia es uno de los procedimientos más comunes llevados a cabo en clínicas de ortodoncia para la preparación de los pacientes que se someterán a cirugía ortognática. Con el fin de optimizar este procedimiento en términos de tiempo, los autores describen una nueva técnica de modelado utilizando cera utility. De esta forma, la oclusión dental puede ser modelada de manera más rápida y precisa, por tanto, optimizando el tratamiento de estos pacientes.

PALABRAS CLAVE: ortodoncia, cirugía ortognática, impresiones, modelado.

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