

Simple Way of Recording Dental Arch Forms

SHREYA GUPTA¹, RAM KISHORE RATRE², SANDHYA JAIN³, RITA CHANDKI⁴

ABSTRACT

Like finger prints each individual has a unique dental arch form design. Recording patient's dental arch form may be required in various fields in dentistry be it longitudinal studies for evaluating growth, forensic dentistry and most importantly in orthodontic practice for fabricating arch wires for individual patients. An easy and practical method to obtain individual arch form for each patient is explained.

Keywords: Arch wires, Dental cast, Record

INTRODUCTION

For long term stability and retention in orthodontics the importance of individualizing archwires according to patient's original (pre-treatment) arch forms is well known [1,2]. According to Riedel's theorems of retention [3]- "*Arch form, particularly in the mandibular arch, cannot be permanently altered by appliance therapy.*" Altering the original arch form increases the risk of relapse.

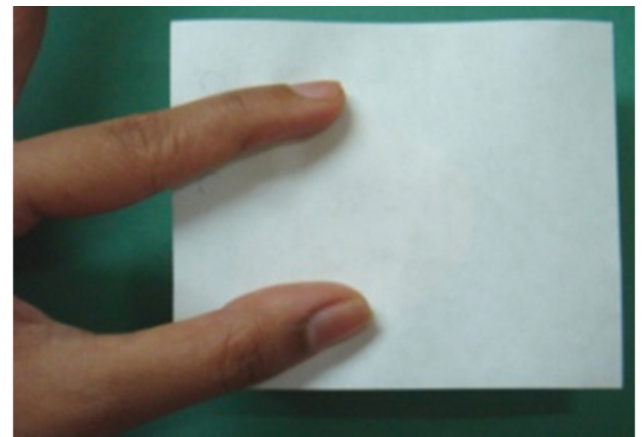
As a general guideline the mandibular arch form should be used as a basic guide to record arch forms. An excellent description of the natural dental arch form is provided by a catenary curve which passes along the buccal and incisal edges of lower teeth [4,5]. Conventional methods suggested include making impression of the dental arch on a wax sheet [6] which is prone to distort overtime, taking photocopy [7] of the dental cast on a Xerox machine which demand additional expenses and space for the Xerox machine in the clinical setup, and taking photographs [8] of the model in 1:1 magnification and getting a print out of it which is also a cumbersome alternative. Of lately, engineers and computer specialists have tried to work out arch forms with mathematical equations. According to Braun [9] the human arch form could be represented by a complex mathematical formula known as the beta function. Begole's [10] Cubic Interpolatory Spline consists of separate cubic polynomial segments connecting a series of points generates different curve configurations of arch forms with minimal error. Similarly, Currier [11] presented with a computerized geometric analysis of human dental arch forms utilizing radiographs of plaster casts. Looking at the phenomenal use of computer and technology it is expected, laser mapping of dental arches and arch wire fabrication through CAD-CAM technology will be the next step in simplifying clinical procedures. However, despite numerous investigations in this regard these systems have not yet been absorbed in the routine dental/orthodontic practice. One of the basic reasons being these techniques seem complicated, expensive, impractical and time consuming in the clinical scenario. Therefore, it is obvious to look out for a more practical, simplified and economical solutions for the same. It has been an accepted fact [2] that the patient's pre-treatment arch form is the best guide for custom designing the arch forms. Therefore, we propose an easy and practical approach to record and obtain arch form for individual patient utilizing the patient's pre-treatment lower dental cast.

PROCEDURE

- Step 1: Buccal and incisal edges of lower teeth on the plaster model are marked with a HB pencil [Table/Fig-1].
- Step2: A plain sheet of paper (6 cm x 10 cm) is kept over the occlusal surface of lower cast and stabilized from posterior region with thumb and index finger [Table/Fig-2].
- Step 3: Index finger of other hand is moved over the sheet of



[Table/Fig-1]: Buccal and incisal edges of lower teeth are marked with a HB pencil

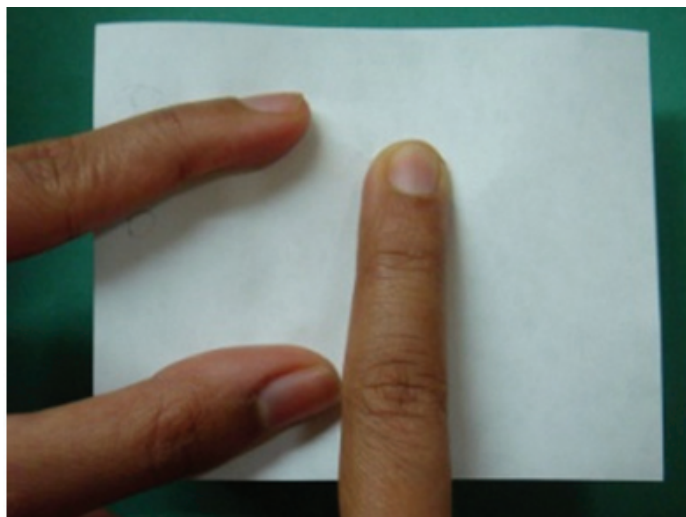


[Table/Fig-2]: A plain sheet of paper (6 cm x 10 cm) is kept over the occlusal surface of lower cast and stabilized from posterior region with fingers

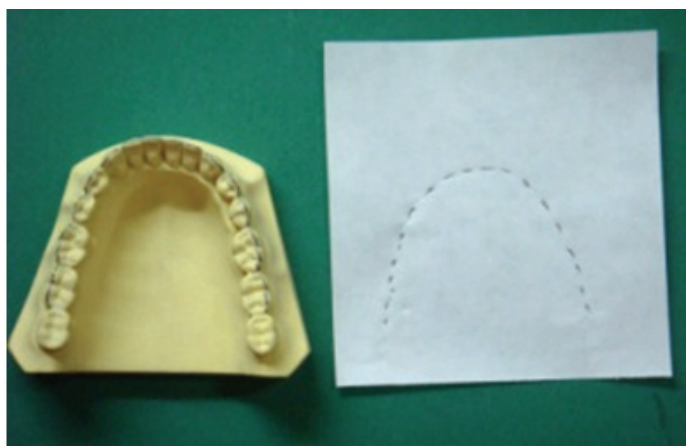
paper to facilitate transfer of the pencil marks on the sheet [Table/Fig-3].

- Step 4: Pencil marks get transferred on the under surface of sheet of paper and arch form is obtained. Mark the midline. This paper with tooth impressions can be laminated and kept as a record after mentioning the patient name, age, date of record and other details [Table/Fig-4].
- Step 5: Pencil marks on the dental cast can be cleaned easily by rubbing a spirit swab over the markings on the dental cast [Table/Fig-5].

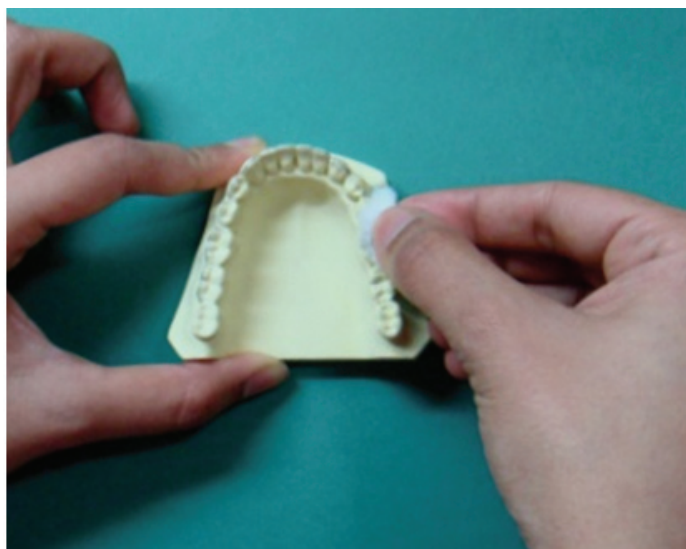
The arch form obtained can be transferred to graph paper. Place this paper on tracing table and get the markings on graph paper.



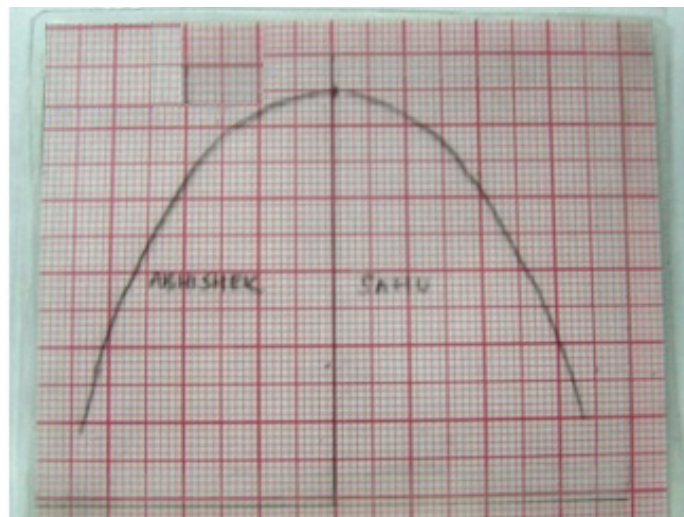
[Table/Fig-3]: Index finger of other hand is moved over the sheet of paper to facilitate transfer of the pencil marks on the sheet



[Table/Fig-4]: Pencil marks get transferred on the under surface of sheet of paper and arch form is obtained. Mark the midline. This paper with tooth impressions can be laminated and kept as a record after mentioning the patient name, age, date of record and other details



[Table/Fig-5]: Pencil marks on the dental cast can be cleaned easily by rubbing a spirit swab over the markings on the dental cast



[Table/Fig-6]: The arch form obtained can be transferred to graph paper. Place this paper on tracing table and get the markings on graph paper. Draw a curve out of the markings. It can be laminated with plastic sheet for future reference. Patient's name and other details can be mentioned with a marker pen.

Draw a curve out of the markings. It can be laminated with plastic sheet for future reference. Patient's name and other details can be mentioned with a marker pen [Table/Fig-6].

CONCLUSION

This article introduces a simple, cost effective and convenient solution for accurately obtaining dental arch configuration for individual patients. The arch form thus obtained can be utilized as a template for orthodontic patient's arch wire fabrication all throughout the treatment, as well as can also be utilized for longitudinal or cross-sectional anthropological, anatomical, dental and prosthodontic research studies on related subjects.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: Dec 06, 2014

Date of Peer Review: Feb 02, 2015

Date of Acceptance: Feb 10, 2015

Date of Publishing: Mar 01, 2015