

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jpfa

Comparison of speed and precision of manual viz a viz computer assisted cephalometric measurements

Gagan D. Kochar ^{a,*}, Balakrishna Jayan ^b, Sukhbir S. Chopra ^c,
Munish Verma ^c, Abhijeet Kadu ^b, Sweta Singh ^d

^a Military Dental Center, Jabalpur, India

^b Research & Referral Hospital, New Delhi, India

^c Armed Forces Medical College, Pune, India

^d Modern Dental College, Indore, India

ARTICLE INFO

Article history:

Available online 27 June 2015

Keywords:

Digital cephalometry

Radiographs

Cephalometric software

ABSTRACT

Objectives: The present study was undertaken for comparing measurements of various cephalometric parameters obtained by hand tracing method with those obtained by computerized software on direct digital lateral cephalograms and scanned lateral cephalograms so as to determine the validity of tracing methods and time required.

Methods: The study sample comprised of hard and soft copy of 100 digital lateral cephalometric radiographs from archives. The study sample was divided into three groups, Group A – comprised of hard copy of radiographs which were traced manually, Group B – comprised of direct digital images and Group C – comprised of scanned images. Both were traced using cephalometric software NemoCeph NX 2006. 18 cephalometric parameters were evaluated.

Result: 30 cephalograms were traced in each group. After ascertaining intra operator reliability rest of the cephalograms were traced. On comparing different groups, statistically significant differences were found for various parameters but the differences were not clinically significant.

Conclusion: The validity and reproducibility of various cephalometric parameters by manual tracing and software tracing of direct digital images and scanned images of lateral cephalogram were found to be highly correlated. In comparison to manual method, tracing using cephalometric software provides a significant time advantage.

Copyright © 2015, Pierre Fauchard Academy (India Section). Publishing Services by Reed Elsevier India Pvt. Ltd. All rights reserved.

1. Introduction

The specialty of orthodontics began as a science of straightening of teeth. Since it became apparent that a beautiful face

was the result of harmonious balance of its constituents the science of jaw proportions and measurements became integral to the specialty of orthodontics. The objective assessment of the same was possible due to the advent of cephalometrics, the origin of which can be traced to the 19th century.

* Corresponding author. Military Dental Center, C/O 56 APO, Jabalpur, India. Tel.: +91 7772978233.

E-mail address: gk81sk@yahoo.com (G.D. Kochar).

<http://dx.doi.org/10.1016/j.jpfa.2015.05.003>

0970-2199/Copyright © 2015, Pierre Fauchard Academy (India Section). Publishing Services by Reed Elsevier India Pvt. Ltd. All rights reserved.

Hofrath¹ and Broadbent² independently devised the head holder to orient the head and face to predetermined standardized position and the cephalostat was inducted to the practice of orthodontics. Cephalometrics thus became the language in which the science of orthodontics began to be written.

Traditionally objective analysis of the lateral cephalograms was performed manually on acetate an overlay which is time consuming.³ Storage of the data and its subsequent reproducibility is difficult and cumbersome.

Advancement in the field of computer sciences and technology has profoundly impacted the medical and dental profession. The computerized cephalometric system that emerged in early 1980's involved indirect method of conversion of hard copy of radiographic image to a digital format using digitizing tablet, camera or flatbed scanner.^{4,5} The digital image was then analyzed using the Disc Operating System. This facilitated storage of data, ease of retrieval and transfers. This had limited capabilities of data analysis.

Robert Ricketts in collaboration with Rocky Mountain Orthodontics pioneered the development and advancement of computerized cephalometric systems.

Digital cephalometric radiography has the advantages of image transmission, manipulation, storage and tele-radiology.⁶ In spite of numerous advantages its poor reproducibility when compared with conventional films has been reported by various researchers.^{7,8} Some researchers have concluded that although there can be statistically significant

difference with respect to reproducibility of cephalometric landmarks and measurements when conventional and digital cephalograms are compared, they might not be clinically significant.^{9,10} Ozsoy¹¹ proposed that user-friendly and time-saving characteristics of computerized tracing makes this method inherently preferable to hand tracing of radiographs.

Due to lack of consensus on the preferred tracing method, keeping in view the cost effectiveness, time taken, accuracy and paucity of studies on the aforementioned issue the present cross-sectional study was undertaken for comparing measurements of various cephalometric parameters obtained by hand tracing method with those obtained by computerized software on direct digital and scanned lateral cephalograms so as to determine the validity of tracing methods and time required.

2. Material and methods

The study sample comprised of hard and soft copy of 100 digital lateral cephalograms from archives. Gender, type of occlusion and skeletal pattern were not taken into consideration in the study design. Cephalograms used were recorded by Panoramic System Model ADVAPX cephalostat machine. Inclusion criteria were radiographs without any artifacts that could interfere with locating anatomical points, permanent dentition and absence of significant craniofacial deformity or

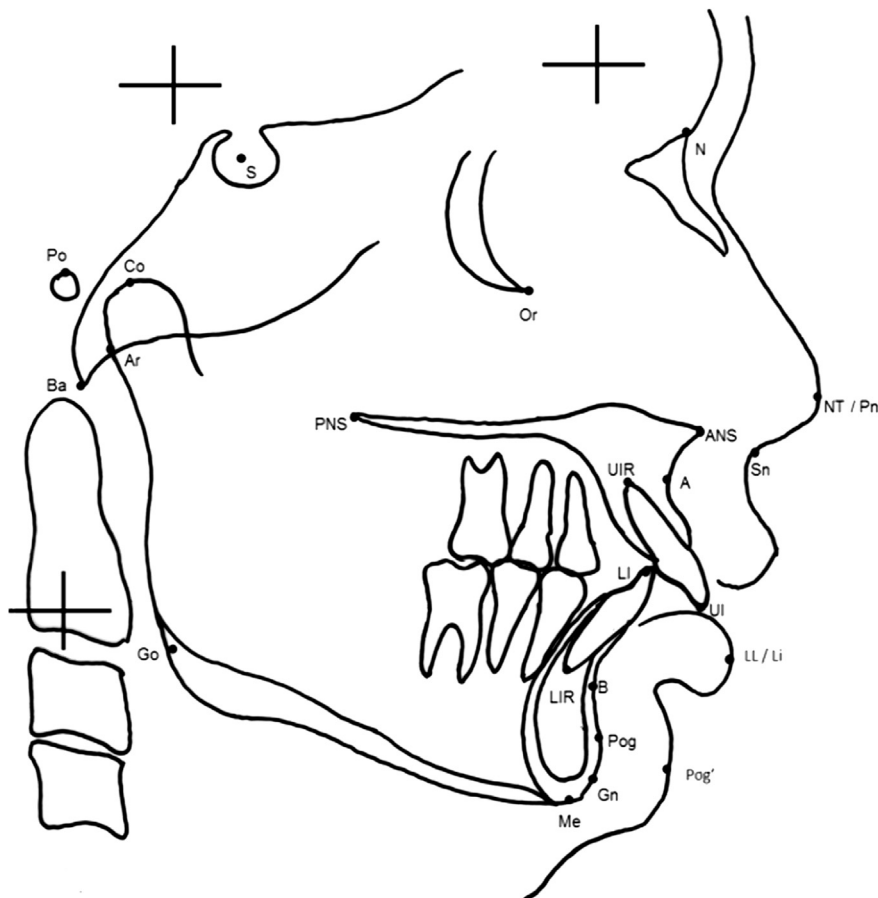


Fig. 1 – Landmarks traced for Group A.

Download English Version:

<https://daneshyari.com/en/article/3160259>

Download Persian Version:

<https://daneshyari.com/article/3160259>

[Daneshyari.com](https://daneshyari.com)