ISSN(e) 2244-8861, ISSN(p) 1856-3201
REVISTA ODONTOLÓGICA DE LOS ANDES
VOL.12, No.2, JULIO-DICIEMBRE 2017

RECIBIDO: 28/03/2017, **ACEPTADO**: 06/06/2017. *págs.* **60—69**

TRABAJO DE INVESTIGACIÓN

IDENTIFICATION OF CLINICAL outcomes from University of Carabobo Orthodontic Residency program based on american board of orthodontic cast criteria

Identificacion de resultados clinicos del postgrado de Ortodoncia de la Universidad de Carabobo basado en los criterios para modelos del Consejo Americano de Ortodoncia

POR

OSWALDO JESÚS **MEJÍAS ROTUNDOA** [1]

[1] Cátedra de Ortodoncia y Ortopedia Dentofacial. Universidad José Antonio Páez. Carabobo, Venezuela.

Autor de correspondencia: Oswaldo Mejias Rotundo. Consultorio Odontológico "La Trinidad" calle Anzoátegui 10-a. Municipio San Diego. Carabobo, Venezuela. Zip: 2006
Teléfono: 00584244913132-00582418911902,
mejiasrotundo@gmail.com

Abstract

The aim of this investigation was to identify treatment outcomes from University of Carabobo Orthodontic Residency program using American Board of Orthodontic's Objective Grading System. Twenty five consecutive final dental cast were score for alignment, marginal ridges, bucolingual inclination, overjet, interproximal contacts, oclussal relationship and contacts. Normal distribution and t-test using 25 pts. for total score was applied with a $P = 0.05$ significance level. Results showed a mean score of 22,160 (CI 18,43 - 25,89). Alignment, bucolingual inclination and overjet had the means highest scores (3,52; 4,72; 4,56). *P-value* of 0,1291 showed no statistical difference from score reference of 25 pts. In conclusion, orthodontic residency students have clinical skills to finish patients with the requirements of phase 2 of american board of orthodontic exam. Determination of initial severity and an update in finishing protocol from cases attending the program are valid tools to improve scores of aforementioned variables.

KEY WORDS (MeSH): treatment outcome, orthodontics, reference standars,universities.

Resumen

El propósito de esta investigación fué la identificación de resultados de tratamientos del Postgrado de Ortodoncia de la Universidad de Carabobo usando el Sistema de Evaluación Objetiva de la Asociación Americana de Ortodoncia. 25 modelos consecutivos a quienes se les adjudico un puntaje para alineación, rebordes marginales, inclinación bucolingual, overjet, contactos interproximales, relación y contactos oclusales. Distribución normal y una prueba t usando 25 puntos para la puntuación total fue aplicada con un nivel de confianza de $P = 0.05$. Los resultados mostraron una promedio de 22,160 pts. (IC 18,43-25,89). La Alineación, Inclinación bucolingual y el overjet obtuvieron la mayor puntuación (3,52; 4,72, 4,56). El *valor P* de 0,1291 demostró ausencias significativas al valor de referencia de 25 pts. En conclusión los residentes del Postgrado de Ortodoncia poseen las habilidades clínicas para finalizar los pacientes con los requisitos de la fase 2 del examen de certificación de la Sociedad Americana. La determinación de la severidad inicial y una actualización en el protocolo de finalización son herramientas validad para mencionar la puntuación en las variables mencionadas.

PALABRAS CLAVE (DeCS): resultado del tratamiento, ortodoncia, estándares de referencia, universidades.

Introduction

Orthodontic treatment outcome consists on final static and dynamic characteristic of the face and occlusion. For that purpose, cephalometric superimpositions and occlusal index have been developed to quantify orthodontic changes and stability [1-5]. In 1929 the first American Board of Orthodontic (ABO) was announce following the spirit of improve orthodontic practices meanwhile protecting public against irresponsible and unqualified practitioners [6].

From that point the ABO Objective Grading System (ABO-OGS) have been widely used to establish and compare treatment outcomes from several protocols, devices and populations and their methods have been included among others international boards orthodontics certification [7-13]. ABO-OGS evaluates the following variables on dental cast: alignment, marginal ridges, buccolingual inclination, overjet, interproximal contact, occlusal relationship and occlusal contact. As mentioned previously [14], each category is highly related with treatment quality and possible undesirable side effect from orthodontic mechanotherapy.

University of Carabobo Orthodontic program had assessed treatment outcomes from their population [15], were their variables such as interproximal spaces, overjet and absence of protrusive interference were obtained, however no robust statistical treatments was applied and no following or comparison with another index have been done. This situation provides a optimal frame for a new evaluation with a simple calibrated instrument like ABO measuring gauge.

The objetive of this investigation was to assess clinical outcomes from dental cast of the residency program using ABO-OGS.

Materials and methods

Study type and design

Exploratory, non experimental.

Inclusion criteria

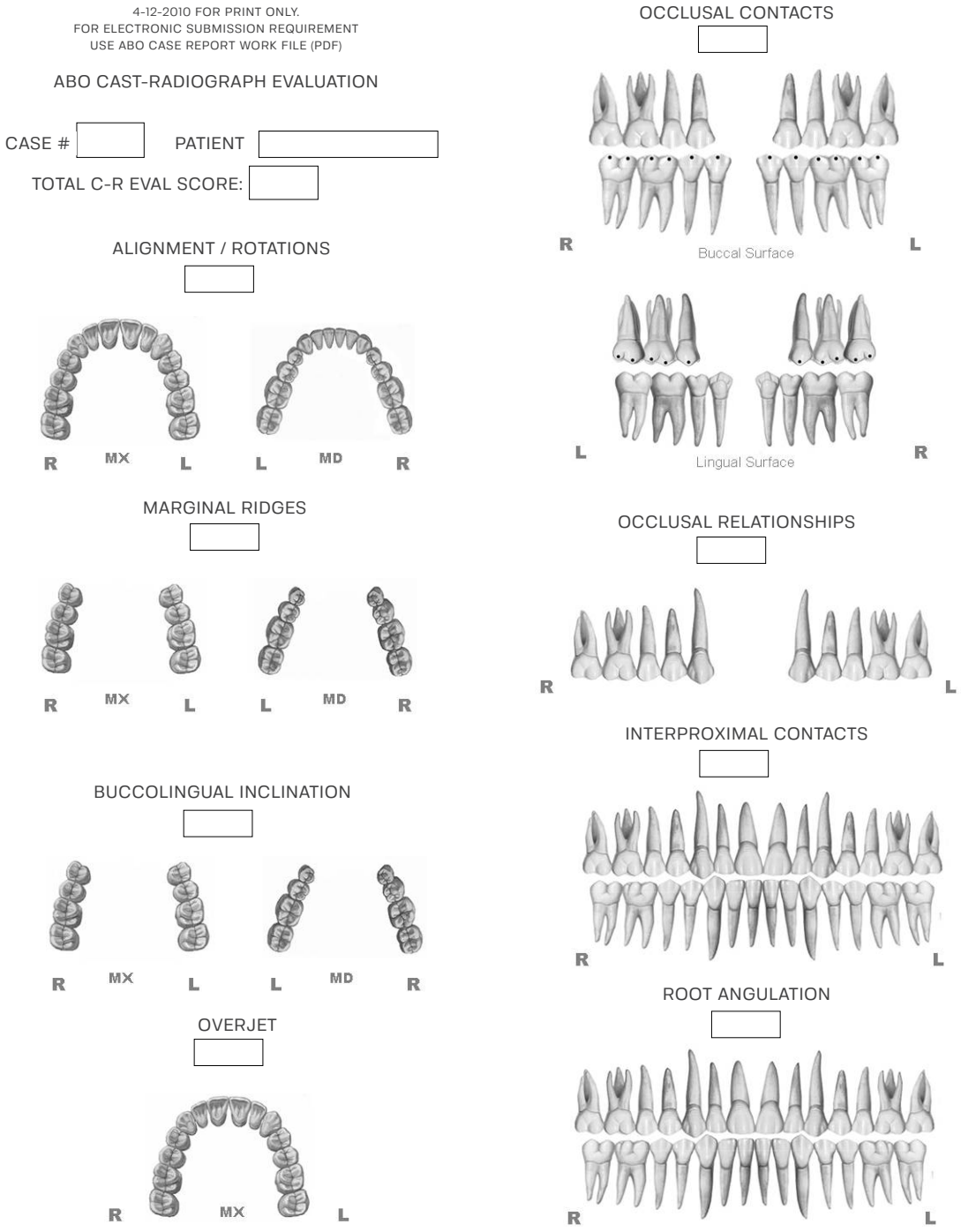
Finished cases treated by 8 Orthodontic Residents between June 2014- June 2016. Residents were unaware of the current investigation at the time of debonding. Full permanent dentition. Good dental cast appearance for proper measurement. Initial discrepancy and panoramic radiographs were not included because of incomplete records from sample.

Data gathering

Materials used in this investigation included: ABO-OGS Cast-Radiograph evaluation worksheet [16], which is a template with a series of dental surfaces slides (for example: maxillary occlusal for alignment or maxillary posterior buccal for oc-

clusal relationship) to score were points are deducted from each category (**FIGURE 1**); ABO-measuring gauge and ½ mechanical pencil.

FIGURE 1.
AMERICAN BOARD OF ORTHODONTIC CAST-RADIOGRAPH EVALUATION WORKSHEET. ADJUSTED FROM AMERICAN BOARD OF ORTHODONTIC WEBSITE (www.americanboardortho.com). PLEASE GO DIRECTLY TO REFERENCE 16 TO OBTAIN A PDF SAMPLE.



INSTRUCTIONS: PLACE SCORE BESIDE EACH DEFICIENT TOOTH AND ENTER TOTAL SCORE FOR EACH PARAMETER IN TE WHITE BOX.
MARK EXTRACTED TEETH WITH "X". SECOND MOLARS SHOULD BE IN OCCLUSION.

Author calibration was performed by a video demonstration for learning proper dental measure followed by 3 practice session using ABO calibrated gauge whit a finished case from his personal collection prior gather data. digital demonstration is available through ABO Youtube Chanel [17]. All data were collected only by the main author.

Statistic analysis

Descriptive values includes means, standard deviations, minimum, median and maximum scores for every variable. Normality test from total score was calculated using Anderson-Darling test Two tails t-test using 25 points as reference for total ABO-OGS score and Statistical software used was Minitab Express for Mac Version 1.5. Significance level set for all statistics was 0,05.

Results

Mean values from sample in **TABLE 1** shows that buccolingual inclination, overjet and alignment scored the highest. Anderson Darling test (AD-Value) demonstrated normality from all variables with exception of alignment and interproximal contact (both with P = <0,0050).

Likewise, **TABLE 2** consolidate individual characteristics variations from each variable within the study.

Also, in **TABLE 3** and **FIGURE 2** lies the results form two-tails t-test. *P.* value of 0,1291 demonstrate that sample ABO-OGS score is lower than 25 pts, although no statitiscal different.

TABLE 1.
AMERICAN BOARD OF ORTHODONTIC OBJECTIVE GRADING SCORES FROM SAMPLE

						ANDERSON-DARLING NORMALITY TEST	
VARIABLE	MEAN (N=25)	STDEV	MIN	MEDIAN	MAX	AD-VALUE	P.
ALIGMENT	3,52	3,28	0,00	2,00	12,00	1,17	<0,0050
MARGINAL RIDGES	3,40	1,77	0,00	3,00	8,00	0,69	0,0641
BUCOLINGUAL INCLINATION	4,72	3,29	0,00	4,00	12,00	0,37	0,3967
OCCLUSAL CONTACT	2,36	1,99	0,00	2,00	7,00	0,70	0,0598
OCCLUSAL RELATIONSHIP	3,08	2,27	0,00	3,00	8,00	0,53	0,1608
OVERJET	3,56	2,39	0,00	3,00	8,00	0,41	0,3159
INTERPROXIMAL CONTACT	1,28	1,56	0,00	1,00	6,00	1,69	<0,0050
TOTAL	**22,16**	**9,03**	**8,00**	**23,00**	**41,00**	**0,47**	**0,2321**

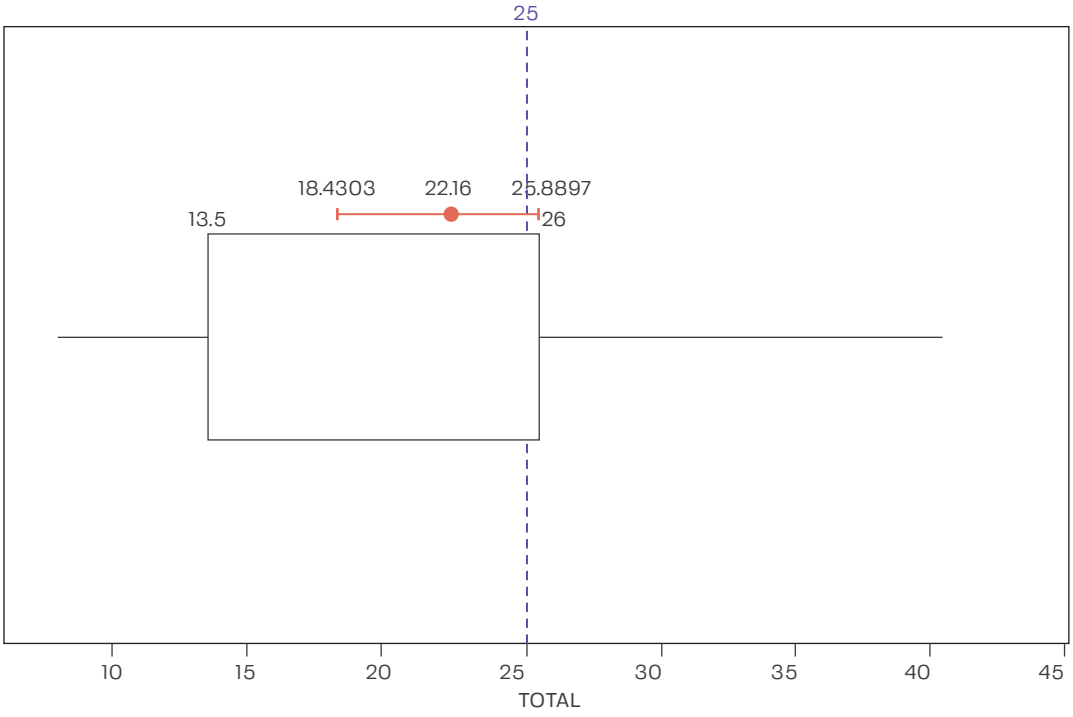
TABLE 2.
INDIVIDUAL CHARACTERISTICS FROM EACH VARIABLE

VARIABLE	CHARASTERISTIC	N	MEAN	STDEV
ALIGMENT	molar max	14	1,35	0,49
	premolar max	7	1,71	1,11
	canine max	4	1,25	0,50
	incisor max	5	1,40	0,54
	molar mdb	8	2,50	2,26
	premolar mdb	8	2,25	1,16
	canine mdb	2	1,50	0,70
	incisor mdb	2	1	0
MARGINAL RIDGES	molars max	16	1,68	0,79
	molar-premolar max	9	1,44	0,72
	premolars max	4	1,25	0,50
	molars mdb	16	1,87	0,88
	molar-premolar mdb	5	2,00	1,22
BUCOLINGUAL INCLINATION	molar max	18	2,83	1,75
	premolar max	4	1	0
	molar mdb	19	2,57	1,80
	premolar mdb	7	1,85	1,06
OVERJET	molar	5	2	1,00
	premolar	8	1,50	0,75
	canine	8	2,12	0,99
	incisor	19	2,57	1,21
OCCLUSAL RELATIONSHIP	molars	14	1,85	1,16
	premolars	15	2,26	1,09
	canines	10	1,70	0,94
OCCLUSAL CONTACT	bucal molars	8	2,00	1,06
	bucal premolars	6	2,33	0,51
	lingual molars	12	1,50	1,00
	lingual premolars	7	2,00	0,57
INTERPROXIMAL CONTACT	molar max	5	1,20	0,44
	molar-premolar max	1	1	0
	premolars max	1	1	0
	premolars-canine max	2	1,50	0,70
	canine-incisor max	1	1	0
	molar-premolar mdb	4	1	0
	premolars mdb	3	1,66	0,57
	premolar-canine mdb	3	1,33	0,57

TABLE 3.
AMERICAN BOARD OF ORTHODONTIC OBJECTIVE GRADING SCORES FROM SAMPLE TOTAL T-TEST

25	22,160	9,035	18,430; 25,890	0,1291

FIGURE 2.
BOXPLOT OF ABO-OGS TOTAL WITH H_0 AND 95% T-CONFIDENCE INTERVAL FROM THE MEAN



Discussion

Health Educational Institutes lies on several principles such respect, not-harm and excellence; faculties and students should strive for the best possible results, pushing the boundaries of science and benefits for their patients, regardless of diagnosis difficulty. Clinical evaluation of former orthodontist should enable the most objective and practical way to point out individual strengths and weakness.

ABO-OGS is an easy way to understand clinical repercussions of treatment decisions and to mentor students progressions; allowing faculties to explain and students to understand consequences of daily basic activities, such: as occlusal relationship evaluation, proper bonding, elastic wearing, patients motivations. If this system is implanted from the beginning of orthodontic residency program, it has more chances to be included as an self evaluation tool in the professional life.

Total scores were similar of those previously reported[18-23]. However, it also found same difficulties on variables surrounding second molars areas like buccolingual inclinations, occlusal relationship and marginal ridges. On some studies, a finishing protocol was implanted afterwards with outstanding results compared to initial assessment, validating the benefits of the system and probably a psychological boost to faculties and students[23-25].

This should not be taken in vain, Venezuela have been immersed in an economical negative fluctuation for may years that have diminished acquisition of remarkable orthodontic supplies and opportunities for continual education overseas. In addition, students have to buy all their equipment and supplies, creating a financial burden and debt to be carrying on for many years in a context whit few growth opportunities as needed and suggested previously[26, 27]. In others words, those students have learned to struggles and manage external and internal situations to accomplish an orthodontic treatment whit good results.

Although no radiographs were included in this studio, if its assumed the maximum standard deviation, it still be in range of the mentioned studies. Therefore, next steps are to incorporate ABO-OGS into case discussion and evaluation, following up assessed cases, enhance good quality of record keeping and design clinical finishing protocol that enables better scores and manages critical areas as commented early.

Conclusions

Residents from University of Carabobo Orthodontic program have the clinical abilities to finish a case whit the standard suggests by American Board of Orthodontic. Determination of initial severity from cases attending the program and an update in finishing protocol are necessary to improve scores of aforementioned variables.

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