

# Contemporary Trends Used By Orthodontists in Various Dental Institutes of Madhya Pradesh- A State Survey

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## Abstract –

**Objective-** the aim of this study was to evaluate contemporary trends used by orthodontists in dental institutes in madhya pradesh.

**Material and method-** a questionnaire study was conducted by handing out anonymous paper questionnaires form consisted of 30 multiple choice questions to elicit information about current trends in orthodontic practice filled by 100 orthodontists of m.p.

**Observation-** a total 100 orthodontist of m.p. Participates in this survey and the result obtained under following headings current diagnostic aids used by orthodontists, current use of fixed appliance therapy, practise of lingual orthodontics in m.p., current trend in extraction therapy, current use of functional appliance, current use of tads (temporary anchorage devices) in orthodontics, type of retainer & retention period followed by trends in accelerated orthodontics and aligners

**Conclusion:** the study concluded that recent technologies were satisfactorily used by the most of orthodontist in m.p. But along with this there is also some improvement in this field for betterment.

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## I. Introduction:

Factual information relating to changing trends in orthodontics is somewhat sparse. To avoid fruitless repetition of past mistakes, it is important that any learned specialty document the various ebbs and flows of its progress.

This type of study was conducted by Brian **M.P.O'Conner**<sup>1</sup> in 1993. It evaluated contemporary trend in orthodontics practice through a National Survey.

The aim of this study was to evaluate contemporary trends used by orthodontists in Dental institutes in Madhya Pradesh and assemble & document data on current trends in orthodontic practice.

The primary targets of this investigation were recognized:

- (1) To collect and report information on current patterns in orthodontic practice.
- (2) To survey the utilization of more current strategy presented in Orthodontics
- (3) To break down the fundamental purposes behind any progressions that may have happened.

There are various new techniques developed to meet the need and comfort of patients. Now a days many such techniques are available which are used to treat cases with severe discrepancies through minimum invasive procedures, but it all depends upon the orthodontist's practice, knowledge and attitude towards newer concepts present in orthodontics<sup>2</sup>.

## II. Material And Method:

The present multi-centric cross-sectional study was conducted primarily in the Department of Orthodontics and Dentofacial Orthopedics at Sri Aurobindo College of Dentistry, Indore (M.P.) with extended 11 other sub-centres of private and government hospitals of Madhya Pradesh.

The questionnaire was prepared according to the similar previous studies, tested questions, response sets and research methodology for survey design was implemented.

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A questionnaire study was conducted by handing out anonymous paper questionnaires to 100 Orthodontists of M.P. working as faculty in Dental colleges as well as who did private practice.

#### **Sample size estimation:**

A list of all the orthodontists working as faculty in dental institutes or doing private practice in Madhya Pradesh was prepared and the sample size of 100 orthodontists of Madhya Pradesh was purposefully selected. No dropouts were reported in the present study.

#### **Questionnaire Development**

The development of the questionnaire was carried out to assess the contemporary trend in Orthodontics; questionnaire was developed in English and was divided into different domains with the first part consisting of the sociodemographic details. The validation of the questionnaire was done by evaluating the content and face validity by presenting the questionnaire to orthodontic experts. Based on their opinions, the relevant changes were made. The final questionnaire of multiple choice questions was prepared to elicit information about current trends in orthodontic practice.

The subjects addressed included the use-

- Current trends in extraction therapy
- Current Diagnostic Aids
- Use of Temporary Anchorage Devices(TADs) and Bone Screws for anchorage control
- Lasers in Orthodontics.
- Lingual Orthodontics
- Use of Myofunctional and Fixed Functional appliance
- Techniques used for accelerating tooth movement (Micro perforation device, Osteoperforation along with bone graft, Corticotomy/wilckodontics)
- Use of Aligners.

Reliability was assessed by checking the agreement between the scores at different assessment and no items were deleted.

#### **Data Collection**

The data collection was carried out by a single investigator by presenting the questionnaire in paper format to all the participants.

#### **Statistical Analysis**

The data collected was entered in Microsoft Excel and subjected to statistical analysis using Statistical Package for Social Sciences (SPSS, IBM version 20.0). Kolmogorov- Smirnov test and Shapiro-Wilks test were employed to test the normality of data. Chi square test was used to analyze the variables.

### **III. Results-**

The data collected was entered in Microsoft Excel and subjected to statistical analysis using Statistical Package for Social Sciences (SPSS, IBM version 20.0). Kolmogorov- Smirnov test and Shapiro-Wilks test were employed to test the normality of data. Chi square test was used to analyze the variables.

Obtained result is concluded under the points.

Diagnostic Aids-

This study revealed that amongst the current diagnostic aids used routinely in practice, study model was found to be the most common one, followed by Lateral cephalograms and Extraoral/Intraoral Photographs. (Table 1) MRI was rarely or never used as dental diagnostic aids. CBCT was occasionally preferred as a diagnostic aid by majority of Orthodontics.(Table 2)

Practice More Defensive-

Majority of the orthodontists believed in practicing more defensively by better patient communication and were also practicing with more detailed records taking and more careful records keeping (Table 3)

Fixed Appliance-

In current use of fixed appliances majority of orthodontists preferred MBT Brackets-(metal/ceramic) prescription and only few preferred Beggs Bracket prescription. None of the orthodontists in the present study shown to used Tip edge bracket (Table 4)

#### Brackets Bonding Techniques-

In bonding technique direct bonding was the most preferred type of bonding in the present study, followed by using dental loops. None of participants did bonding by using lasers. Majority of the participants in the present study rarely preferred indirect bonding technique (Table 5)

#### Tooth Extraction In Orthodontics-

In extraction cases, majority of the participants rarely preferred single mandibular incisor extraction as an alternative to premolar extraction, because selection of tooth extraction is case specific and may vary from case to case (Table 6)

#### Lingual Orthodontics-

The obtained data had showed that majority of the participants about 58% never treated a case with lingual orthodontics; only 2 % orthodontists routinely practiced lingual Orthodontics in M.P. ( Table 7)

#### Miniscrew/ Temporary Anchorage Device(Tad)-

The study showed that majority of the participants were occasionally (60%) using miniscrew implants or TAD in their practice (Table 8), while rarely did the participants in the present study use Buccal shelf supporting (BSS) implant and Infra-zygomatic crest (IZC) screw for anchorage control. ( Graph 1,2)

#### Functional Appliance For Class Ii Correction-

For the correction of class II, most preferred removable myofunctional appliance by the participants was Twin Block in growing patients (Table 9)

Most preferred fixed functional appliance was found to be Forsus fatigue resistance followed by Power scope. Advansynce and Herbits was rarely preferred by orthodontist (Table 10)

#### Laser In Orthodontics-

Majority of the participants in the present study never (53%) or rarely ( 29%) used Lasers in their orthodontics practice while half of the participants never used newer arch wire from day one in their orthodontic cases. (Table 11)

#### Retention Protocol In M.P.-

For retention protocol most preferred retainer was found to be Bonded maxillary and mandibular retainer followed by Lower bonded and upper Hawley's retainer (Table 12) and the most preferred retention period was 1.5- 2 years by most of the participants followed by 1-1.5 year (Table 13)

#### Accelerated Orthodontics-

In this era of rapid orthodontics majority of the participants occasionally used method of accelerating rate of Orthodontic tooth movement, in which the Micro-Osteoperforations (MOP) and Corticotomy were the most commonly used methods of accelerating orthodontic tooth movement by the orthodontists in the present study (Table 14)

#### Aligners-

Aligner treatment was never done by large number (36%) of participants, but it also reported those participants who are occasionally (31%) or rarely (24%) using the aligners. Invisalign was the most commonly used aligner (Graph 5,6)

## IV. Discussion

### Sociodemographic Data

Among 100 Orthodontists the mean age of participants was found to be 35.48± 6.20 with minimum age being 27 years and maximum being 54 years respectively. Also majority of the participants were practicing orthodontics from 0-5 years (49%), followed by 5-10 years (27%), only one participant in the present study was practicing orthodontics for more than 20 years.

### Current Diagnostic Aids Used By Orthodontists

Majority of the participants in the present study occasionally preferred CBCT as a diagnostic aid, CBCT was routinely used by only 3% of participants in the present study. The study done by **Reddy Lavanya et al**<sup>4</sup> concluded that there is lack of knowledge about CBCT among PG students. **Sunita Sugumaran et al.**<sup>5</sup> concluded that orthodontists need to constantly update their knowledge and skills in interpreting and utilizing a

CBCT, and only 12% orthodontist in M.P. used digital software (Nemoceph/ Dolphin software) in their practice.

### **Current Use Of Fixed Appliance Therapy**

According to present study results majority of orthodontists in M.P. preferred MBT Brackets-(metal/ceramic) prescription and only few preferred Beggs Bracket prescription. None of the orthodontists in the present study used Tip edge bracket. As incorporation of tip and torque within the brackets decreased the need of wire bending at finishing stage<sup>6</sup> due to which the popularity and use of MBT brackets prescription increased now a days.

**Mahesh Jain et al.**<sup>7</sup> conducted a study to compare the orthodontic cases finished with Roth and MBT prescription and concluded that the outcome for the MBT prescription was better than that of Roth prescription, which is statistically significant, but with little or no clinical significance.

Use of magnification loupes in orthodontics can assist orthodontists in producing a higher quality of care. Properly fitted loupes can improve posture and can reduce the risk of muscle pain in the back, neck and shoulders. The improved ergonomic factors can have significant ramifications for your health and career longevity.<sup>8</sup> **K. J. Juggins**<sup>9</sup> in his article described about the principles of magnification, he briefly discusses the magnification loupes and highlights the advantages and disadvantages of using magnification for orthodontic treatment.

None of the participants in the present study were using bonding with lasers, and also addressed that majority of the participants in the present study rarely preferred indirect bonding technique. As Indirect bonding (IDB) has been in orthodontic practice for more than 35 years. But still, most of the clinicians use direct bonding procedures.

The main reason for this might be technique sensitivity and demand of additional laboratory procedures, increasing the cost of the treatment.<sup>10,11</sup>

### **Practise Of Lingual Orthodontics In M.P.**

According to present study data it has been observed that Majority of the participants in this study 52% never treated a case with lingual orthodontics. Only 2 % orthodontists practiced lingual Orthodontics in M.P. The study conducted by **Sourabh Agrawal et al**<sup>12</sup> on the practice of Lingual Orthodontics in India also concluded that there is still room for betterment in terms of the final treatment outcome and many orthodontists feel that there is need of formal training for experience in lingual orthodontics.

### **Current Trend In Extraction Therapy**

The extraction rate was declined from previous era **O'Connor**<sup>1</sup> in survey study found that the extraction rate has declined considerably; the decision to extract fewer teeth was influenced by a combination of TMJ concern, medico legal concerns, or as defensive measures. Although a routine causative link between premolar extraction and subsequent development of TMD is overwhelmingly rejected. **Camila de S**<sup>13</sup> addressed in their study that new aesthetic concepts contributed to reducing the number of cases treated with dental extractions. **Guilherme Janson**<sup>14</sup> the non-extraction protocol frequency increased gradually with consequent reduction of extraction treatments. And rarely (59%) the participants in the present study preferred single mandibular incisor extraction instead of premolar extraction, because it is not applicable on all orthodontic cases, Precise case selection is required. **Mirian Aiko Nakane Matsumoto et al**<sup>15</sup> explained about the lower incisor extraction as treatment alternative to premolar extraction.

According to **Brandt and Safirstein**<sup>16</sup> there is a tendency for space to re-open at the extraction site, especially when a lower central incisor is extracted, irrespective of root parallelism adjacent to the extraction site. Other effects which are undesirable are increased overbite and overjet beyond the acceptable limits, improper occlusion, relapse of crowding in three incisors as well as in the extraction area esthetic loss of interdental papilla and midline shift<sup>17,18,19,20</sup>

### **Current Use Of Functional Appliance**

#### **Myofunctional appliance-**

The myofunctional appliances are used for skeletal correction(both classII and classIII) in growing patient. present study results shows that amongst various myofunctional appliances most preferred one was Twin Block (97%) due to its agreeableness, flexibility, adaptability, effectiveness, and simplicity of steady mandibular advancement for correction of retroclined mandible or class II malocclusion in growing age.<sup>21</sup>

**Fixed functional appliance-** They were used in adolescents to promote mandibular growth and eliminating excessive overjet, but with them we achieve more dental correction than skeletal. Among various fixed functional appliance most preferred was to be Forsus fatigue resistance (FRD),because It is more compliance to patients, flexible and easy to clean by patient themself. Yagmur Lena<sup>22</sup> et al in survey study also

found that Patients needed less time to adapt to the Fatigue resistant device(FRD) then others fixed functional appliances. Eating difficulties were encountered by patients in the fixed myofunctional appliance (FMA) group which include rigid appliances like Advansynce and herbt's.

### **Current Use Of Tads (Temporary Anchorage Devices) In Orthodontics**

Nowadays temporary anchorage devices (TADs) became a long time treatment modality in orthodontia and have facilitated successful treatment of more complicated orthodontic cases like borderline adult class II and asymmetric cases with less invasively than surgery,<sup>23</sup> as well as well accepted by the patients also.<sup>24,25</sup>

The present study concluded that only 26% Orthodontists routinely used TADs in their practice. So we need more practice and knowledge of TADs so we include them in our routine orthodontic practice.

Rarely did the participants in the present study use Buccal shelf supporting (BSS) implant and Infra-zygomatic (IZC) implant for anchorage control.

### **Type Of Retainer & Retention Period Followed By Orthodontist**

The present study results showed that most preferred retainer was found to be Bonded maxillary and mandibular retainer 35% followed by Lower bonded and upper Hawley's retainer 29% with retention period of 1.5- 2 years was recommended by the Orthodontists in M.P. Survey done by **Andriekute et al.**<sup>26</sup> shows that A combination of fixed and removable retainers was the most often used in an orthodontic retention. **Norma Ab Rahman et al**<sup>27</sup> in their study showed that Vacuum-formed retainers are the most commonly used by orthodontists then fixed because it is easy accepted by patients and less clinical time is needed. Retainers practice is different in M.P than others.

### **Accelerated Orthodontics:**

Present study shows that majority of the participants 38% occasionally used any method for accelerating rate of Orthodontic tooth movement and also concluded that amongst various methods Micro-Osteoperforations 42% and Corticotomy 41% were the most commonly used methods of accelerating orthodontic tooth movement by the orthodontists while Piezocision technique was used by 26% and Periodontally accelerated osteogenic Orthodontics (PAOO) was used by 21% of respondents. Whereas the PRP method was never used by 81% or rarely 19% used by orthodontists<sup>28</sup>.

### **Practice Of Aligner-**

As we all aware about that now a day peoples were more concern about their looks and appearance so the demand of aesthetic treatment is increasing. They are seeking alternative for fixed orthodontic appliances and Aligners are best option and they gained immense popularity over last decades. It has become first choice among today's population including both adults and teenagers. So Aligner is one of aesthetic and comfortable option for orthodontic treatment.<sup>29</sup>

## **V. Conclusion-**

The result obtained from the study was concluded according to the points mentioned above that the recent technologies were satisfactorily used by the most of Orthodontists in M.P. but along with this, there is also a need of some improvement in this field as this study addressed that rarely orthodontists practised lingual orthodontics and aligners, with less use of Digital software(Nemoceph/ Dolphine imaging ), Laser, TADs(BSS, IZC) in their routine practice. So there is urgent need of more training programs and practice in this field for better results in diagnosis and treatment planning.

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**Table 1: Current diagnostic aids routinely used in practice**

DIAGNOSTIC AIDS	N	(%)
Study Model	90	90
Extraoral/Intraoral Photographs	88	88
IOPA	37	37
OPG	70	70
Lateral cephalograms	89	89
MRI	-	-
Wrist X-ray	6	6
CBCT	36	36
Digital Software (Nemoceph / Dolphin software).	12	12

**Table 2: Preference of CBCT as a diagnostic aid**

Routinely	Occasionally	Rare	Never
N (%)	N (%)	N (%)	N (%)
3(3)	75(75)	21(21)	1(1)

**Table 3: Methods of practising more defensively**

METHODS	N	(%)
More detailed records taking	65	65
More careful records keeping	55	55
More detailed consent form	34	34
Fewer extraction	15	15
Better patient communication	77	77
More careful patient selection	-	-
Other	-	-

**Table 4: Type of bracket prescription usually preferred**

BRACKETS PRISCRPTIONS	N	(%)
MBT Bracket- (metal/ Ceramic)	98	98
Self ligating (metal /ceramic)	13	13
Beggs Bracket	6	6
Tip edge	-	-
Any other	-	-

**Table 5: Type of bonding usually preferred by Orthodontists**

Direct	Indirect	Using Dental Loops	Using Laser
N (%)	N(%)	N(%)	N (%)
86(86)	-	14(14)	-

**Table 6: Preference of Single mandibular incisor extraction instead of premolar extraction**

Routinely	Occasionally	Rare	Never
N (%)	N (%)	N (%)	N (%)
1(1)	37(37)	59(59)	3(3)

**Table 7: Practice of lingual orthodontics in Madhya Pradesh**

Routinely	Occasionally	Rare	Never
N (%)	N (%)	N (%)	N (%)
2(2)	17(17)	23(23)	58(58)

**Table 8: Frequency of using miniscrew implant or TAD for anchorage in Orthodontics**

Routinely	Occasionally	Rare	Never
N (%)	N (%)	N (%)	N (%)
26(26)	60(60)	12(12)	2(2)

**Table 9: Type of myofunctional appliance frequently preferred**

Activator	Bionator	Twin Block	Frankel Appliance
N (%)	N (%)	N (%)	N (%)
2(2)	1(1)	97(97)	-

**Table 10: Type of fixed functional appliance preferred for correction of class II**

Advansynce	Power Scope	Herbst	Forsus fatigue resistance appliance
N(%)	N(%)	N(%)	N(%)
6(6)	21(21)	4(4)	69(69)

**Table 11: Frequency of uses of Laser in Orthodontists**

Routinely	Occasionally	Rare	Never
N (%)	N (%)	N (%)	N (%)
4(4)	14(14)	29(29)	53(53)

**Table 12: Type of retainer mostly preferred by Orthodontists In M.P.**

TYPES OF RETAINERS	N	(%)
Beggs wrap around retainer	9	9
Hawley's retainer	18	18
Essix retainer	9	9
Lower bonded and upper Hawley's retainer	29	29
Bonded maxillary and mandibular retainer	35	35

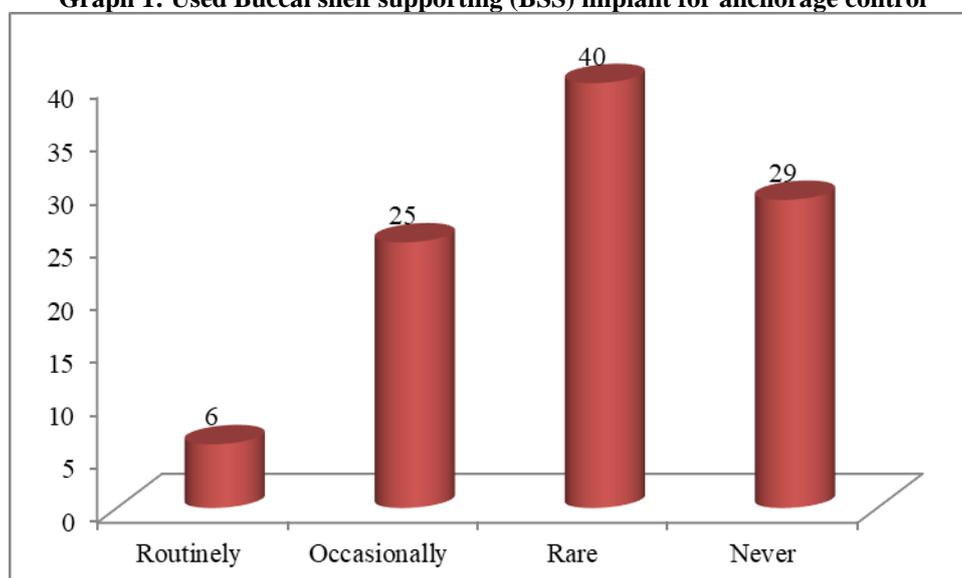
**Table 13: The retention period followed by Orthodontists**

6 months- 1 year	1-1.5 yrs	1.5- 2 years	More than 2 years
N (%)	N (%)	N (%)	N (%)
14(14)	30(30)	32(32)	24(24)

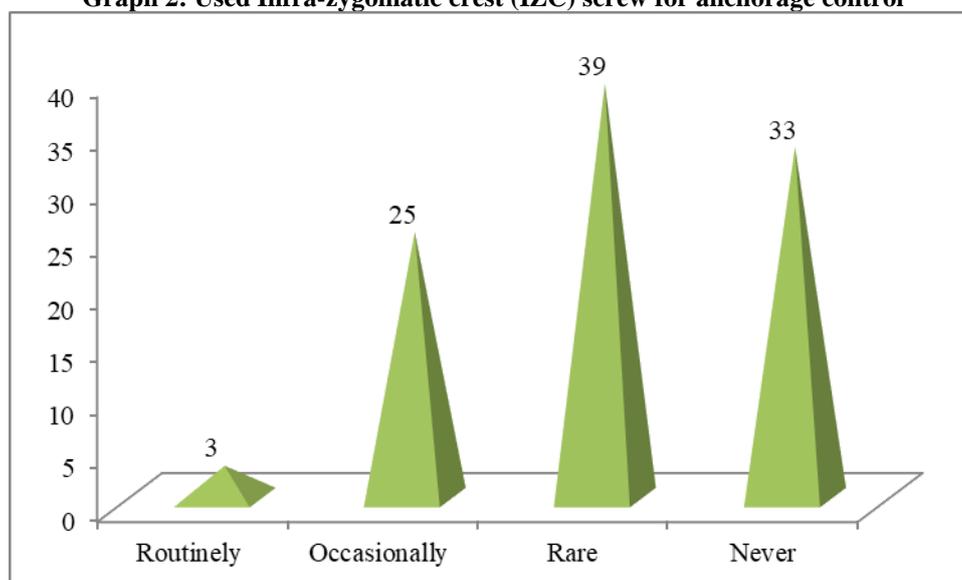
**Table 14: Methods of accelerating tooth movement used by orthodontists till now**

VARIUOS METHODS	N	(%)
Corticotomy	41	41
Corticision	2	2
Piezocision technique	26	26
Micro-Osteoperforations (MOP)	42	42
Low-level laser therapy (LLLT)	14	14
Drugs	13	13
Periodontally accelerated osteogenic Orthodontics(PAOO)	22	22
Any Other	2	2
None	8	8

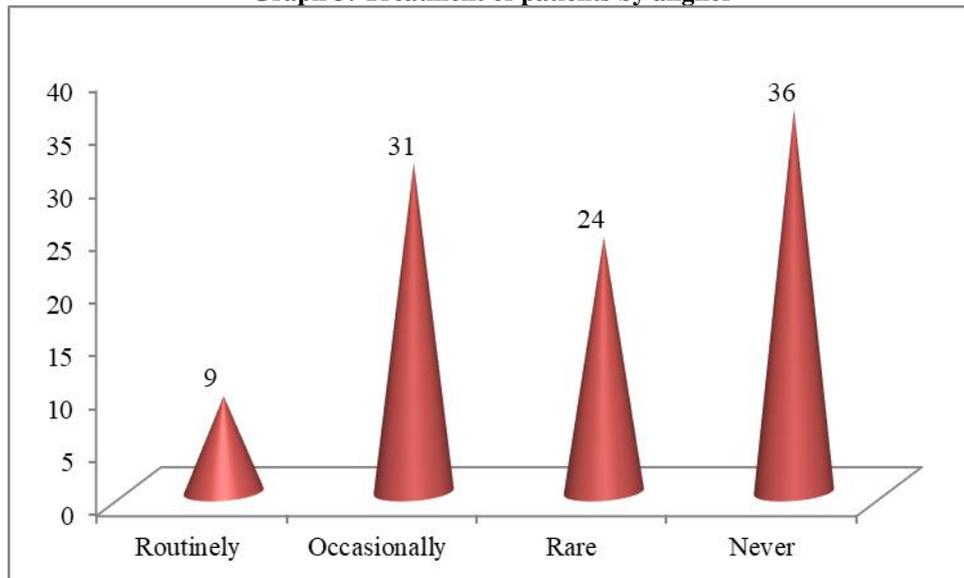
**Graph 1: Used Buccal shelf supporting (BSS) implant for anchorage control**



**Graph 2: Used Infra-zygomatic crest (IZC) screw for anchorage control**



**Graph 3: Treatment of patients by aligner**



**Graph 4: Aligner's company which orthodontists usually prefer**

