

# Molar Banding or Bonding? What do Orthodontists Prefer in Routine Clinical Practice?

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## ABSTRACT

**Background:** Whether to band molars or bond them during Orthodontic treatment has now become a dilemma to many Orthodontists practicing across the country. Both banding and bonding have their pros and cons. The terminal attachments of fixed appliances are placed on molar teeth; most commonly the first permanent molars. These attachments can take the form of a cemented molar band or a bonded molar tube. The active phase of fixed orthodontic appliance treatment takes an average of two years to complete. To reduce the likelihood of emergency visits, improve patient experience and avoid lengthy treatment times it is important that these attachments have low failure rates.

**Aim:** This questionnaire based survey aims to evaluate whether orthodontists prefer molar banding or bonding in their routine clinical practice.

**Methodology:** A sample of 157 participants (orthodontists) was taken after assessing the sample size within the age group of 27 - 50 years of age. The participants comprised of orthodontists practicing in various parts of India. A Questionnaire was created on Google forms and circulated to participants using various social media platforms. The data of responses of

participants were analyzed and evaluated with the help of pie charts.

**Results:** This survey analyzed Orthodontists' choice during banding / bonding of molars and tried to evaluate the common problems faced during either banding molars or bonding them with bondable molar tubes. Majority of Orthodontists preferred bondable molar tubes over banding in routine orthodontic practice. The most common problem faced by majority orthodontists associated with banding was increased chair-side time and increased gingival impingement and irritation, whereas the most common problem faced by them associated with bonding with bondable molar tubes was increased tendency of breakages. Majority of Orthodontists felt that banding in orthodontics was unnecessary as it took up a lot of clinical time and they also asserted that in their experience, frequency of breakages were mostly associated with bondable tubes than bands. However the most striking and highlighting feature of this study was that participants believed that banding molars did not have any added advantage over using bondable molar tubes.

**Conclusion:** This questionnaire based survey clearly helped in proving that Orthodontists preferred using bondable molar tubes over molar banding in their routine clinical practice

as they believed that it saved a lot of clinical time, provided benefits that outweighed its drawbacks and moreover were in no way inferior to molar banding when used during routine fixed orthodontic treatment.

**Key words:** Molar Banding, Molar Bonding, Orthodontist preference, Clinical practice, Questionnaire, Survey

## INTRODUCTION

Whether to band molars or bond them during Orthodontic treatment has now become a dilemma to many Orthodontists practicing across the country. Both banding and bonding have their pros and cons. The terminal attachments of fixed appliances are placed on molar teeth; most commonly the first permanent molars. These attachments can take the form of a cemented molar band or a bonded molar tube. The active phase of fixed orthodontic appliance treatment takes an average of two years to complete. To reduce the likelihood of emergency visits, improve patient experience and avoid lengthy treatment times it is important that these attachments have low failure rates. Indeed, it has been suggested that 'Loose attachments lower morale, reduce profitability and wreak havoc with scheduling'<sup>1</sup> and whilst a zero per cent attachment failure is not a realistic goal, failure rates should be less than 5%.<sup>1</sup> Prior to the advent of enamel bonding techniques, the use of orthodontic bands on first permanent molar teeth was universal. Many orthodontists continue to favour molar bands due to beliefs regarding lower failure rates and reliability.<sup>2,3</sup> With improvements in band design (micro-etching, innovative mechanical retention features)

further failure rate reductions have followed.<sup>4,5</sup> Simultaneously, bonded molar tubes have become increasingly popular as advances in attachment design and materials science have led to improved survival behaviour.<sup>6-11</sup> Advocates of molar tubes claim these attachments are more efficient and convenient, allow for easier maintenance of oral hygiene and reduce demineralization. However, there is little

prospective clinical literature evaluating the success of bands compared with bonds on molar teeth using contemporary modern materials.<sup>12</sup> The majority of studies in this field are retrospective or non-comparative.<sup>13-15</sup> Although much laboratory based work has been conducted on molar attachment failure behaviour, there are problematic issues with applying in vitro findings to the clinical environment.<sup>16</sup> Flaws in study design and data analysis in the field of bond and band failure research have been highlighted by others.<sup>17</sup> Enamel demineralization is a recognized iatrogenic risk factor associated with fixed appliance orthodontic treatment.<sup>18</sup> It has been reported that 50% of patients undergoing fixed appliance treatment develop at least one white spot lesion.<sup>19</sup> The aesthetic and dental health impact of such demineralization is recognized<sup>20</sup> and many researchers are attempting to identify effective interventions to reduce demineralization during orthodontic treatment.<sup>21</sup> Recent systematic reviews have recommended bonding and banding studies should measure demineralization as a secondary outcome where possible in order to improve the reporting quality of clinical trials.<sup>22,23</sup> This questionnaire based survey aims to evaluate whether orthodontists prefer molar banding or bonding in their routine clinical practice.

**AIM-** To evaluate whether Orthodontists prefer molar banding or bonding in their routine clinical practice.

## OBJECTIVES

1. To assess if the Orthodontists prefer banding of molars or bonding with bondable molar tubes.
2. To assess the common problems orthodontists face while banding molars or while using bondable molar tubes.
3. To assess if banding molars over bonding has an added advantage and vice-versa

## METHODOLOGY

A cross sectional study was conducted over duration of 3 months. A

sample of 157 participants (orthodontists) was taken after assessing the sample size within the age group of 27 - 50 years of age. The participants comprised of dentists practicing in various parts of India. A Questionnaire was created on Google forms and circulated to participants using various social media platforms. The data of responses of participants were analyzed and evaluated with the help of pie charts.

## SELECTION CRITERIA

### 1. Inclusion Criteria

1. Dentists who have completed MDS in Orthodontics

2. Dentists willing to give informed consent for participation in study
3. Dentists practicing in private clinics
4. Participants in the age group of 27 to 50 years

### 2. Exclusion criteria

1. Non Orthodontists
2. Participants unwilling to give informed consent for participation in study
3. Other dentists who do not work in private clinics
4. Participants below 27 years or above 50 years

Sample Size – 157

## Sample size calculation

[3]Sample Size for Frequency in a Population	
Population size(for finite population correction factor or fpc) (N):	1000000
Hypothesized % frequency of outcome factor in the population (p):	93%+/-5
Confidence limits as % of 100(absolute +/- %)(d):	5%
Design effect (for cluster surveys-DEFF):	1
Sample Size(n) for Various Confidence Levels	
ConfidenceLevel(%)	Sample Size
95%	157
80%	143
90%	91
97%	123
99%	173
99.9%	282
99.99%	375
Equation	
Sample size $n = [DEFF * N * p(1-p)] / [(d^2 / Z^2 * 1 - a/2 * (N-1) + p * (1-p)]$	
Results from <a href="#">OpenEpi</a> , Version 3	

## METHOD

A Google form of the questionnaire was created to analyze whether Orthodontists prefer banding molars or bonding with bondable molar tubes in routine clinical practice. The questionnaire along with a brief synopsis explaining the aims and objectives of the study was sent to participants. The participants were approached by the principal investigator and co-investigator via personal connections and WhatsApp groups. The aims and objectives of the study were explained in a message

accompanying the online questionnaire link. Informed consent was taken from all the participants before solving the questionnaire. Timely reminders were sent as well. The participation was completely voluntary and all the participants had an option of opting out of the study by not filling the questionnaire. The questionnaire consisted of a total of 10 questions. They were aimed to evaluate the Orthodontists choice pertaining to molar bonding/banding in routine clinical practice.

## **QUESTIONNAIRE**

The questions were a mix of multiple choice questions. After some questions about the informed consent, gender and age the following questions were asked:

- 1) Do you prefer banding molars or using bondable molar tubes?
- 2) What are the common problems you encounter with banded molars?
- 3) What are the common problems you encounter with bondable molar tubes?
- 4) Do you feel banding in orthodontics is unnecessary as it takes up a lot of clinical time?
- 5) What is the frequency of breakages of bondable molar tubes in your experience?
- 6) What is the frequency of breakages of molar bands in your experience?
- 7) Do you feel molar bands cause unnecessary gingival impingement and irritation?
- 8) Do you feel bondable molar tubes are associated with increased breakages?
- 9) Do you feel molar bands are associated with increased breakages?
- 10) Do you feel banding molars over bonding has an added advantage?

### **Statistical Analysis:**

Descriptive analysis was performed with the help of SPSS software and mean and standard deviation was recorded

## **RESULTS**

This survey analyzed Orthodontists choice during banding / bonding of molars and tried to evaluate the common problems faced during either banding molars or bonding them with bondable molar tubes. This questionnaire based study highlighted the following results:-

1. Majority of Orthodontists preferred bondable molar tubes over banding in routine orthodontic practice.
2. The most common problem faced by majority orthodontists associated with banding was increased chair-side time and

increased gingival impingement and irritation

3. The most common problem associated with bonding with bondable molar tubes was increased tendency of breakages.

4. Majority of Orthodontists felt that banding in orthodontics was unnecessary as it took up a lot of clinical time

5. The participant Orthodontists also asserted that in their experience, frequency of breakages were mostly associated with bondable tubes than bands.

6. The most striking and highlighting feature of this study was that participants believed that banding molars did not have any added advantage over using bondable molar tubes.

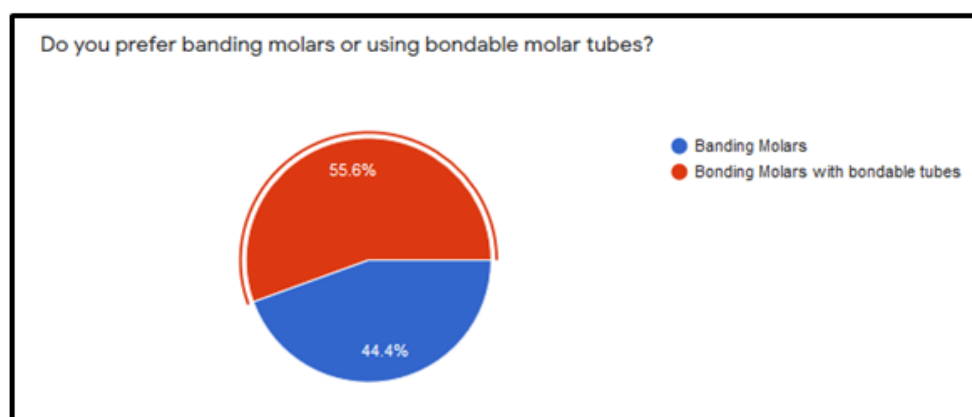
## **DISCUSSION**

Orthodontists have been examining the need for bonding molar attachments. The advantages are plenty: it has been theorized in the literature that the very act of placing separators tends to sensitize the periodontal ligament, setting in motion the cellular processes responsible for orthodontic tooth movement and possibly compromising anchorage, even before loading in extraction treatment. The initial pain on placement of separators requires medication and, in cases of anticipated bacteraemia, antibiotic cover may be necessary. Economy of space in non-extraction treatment is also crucial. However, to assess the preference of orthodontists towards molar banding or bonding in orthodontics, this questionnaire based study was carried out. We needed to assess whether Orthodontists prefer banding each case or use bondable molar tubes for that same. Firstly, a sample size was estimated based on previous studies done related to the same topic. The sample size was calculated using software for sample size calculation. The sample size was estimated to be 157. A Questionnaire was then fabricated on Google Forms which was then circulated to age groups from 27 to 50 years via various WhatsApp groups. The consent of the participant was recorded on

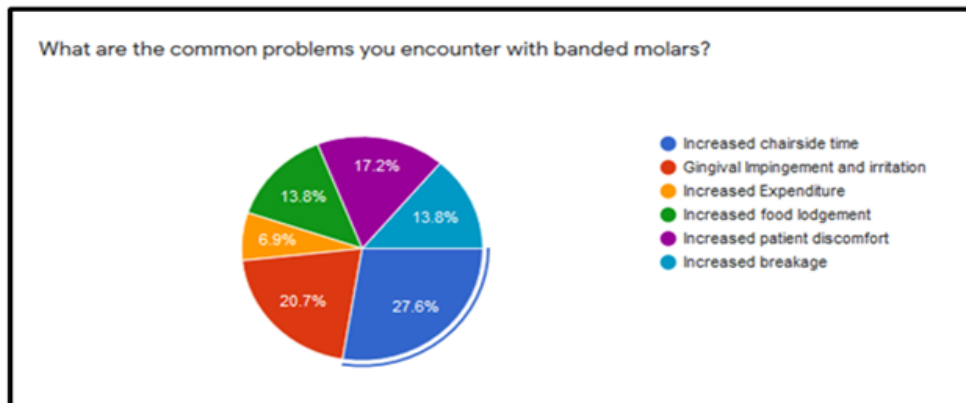
Google forms itself. After 157 participants filled the Google questionnaire form, the data was collectively analyzed. A majority of 55.6% of participants preferred bonding molars with bondable molar tubes (Fig 1) and 44.4% of the participants preferred banding molars in every case. A majority of 27.6% of the participants complained of increased chair side time as the most common problem associated with banding, 20.7% of them polled that gingival impingement and irritation was the most common problem associated with banding and other small percentage of participants suggested various other problems they faced associated with banding like increased expenditure, increased food lodgement, increased patient discomfort and increased breakages (Fig 2). However the latter mentioned problems were minimal. On asking the participants about the common problems they faced with bondable molar tubes, there was a confounding array of concerns listed. 41.7% of them reported of increased breakages, 25% reported of difficulty in bonding while placing bondable molar tubes and 33.3% of them reported of lack of anchorage control with bondable molar tubes (Fig 3). A whopping majority of 63.6% of participants felt that banding in orthodontics was unnecessary as it took up a lot of their clinical time, whereas 36.4% of them felt the contrary (Fig 4). 66.7% of participants reported that they sometimes experienced breakages in bondable molar tubes, 22.2% of them reported that they

always experienced breakages and a minority of 11.1% of the participants reported that they never experienced breakages of bondable molar tubes (Fig 5). On the contrary, 54.5% of the participants polled that they never experienced breakages in molar bands (Fig 6). This was indicative enough that frequency of breakages of molar bands was much more less than bondable molar tubes. However, a majority of 54.5% of the participants agreed with the fact that molar bands caused unnecessary gingival impingement and irritation (Fig 7), so there were pros and cons to using bands over bondable tubes. A majority of 36.4% of the participants strongly agreed that bondable molar tubes were associated with increased breakages (Fig 8) whereas 54.5% of the participants disagreed that molar bands were associated with increased breakages (Fig 9). The most striking and highlighting feature of this study was that a majority of 72.7% of participants believed that banding molars did not have any added advantage over using bondable molar tubes (Fig 10). This questionnaire based survey clearly helped in proving that Orthodontists preferred using bondable molar tubes over molar banding in their routine clinical practice as they believed that it saved a lot of clinical time, provided benefits that outweighed its drawbacks and moreover were in no way inferior to molar banding when used during routine fixed orthodontic treatment.

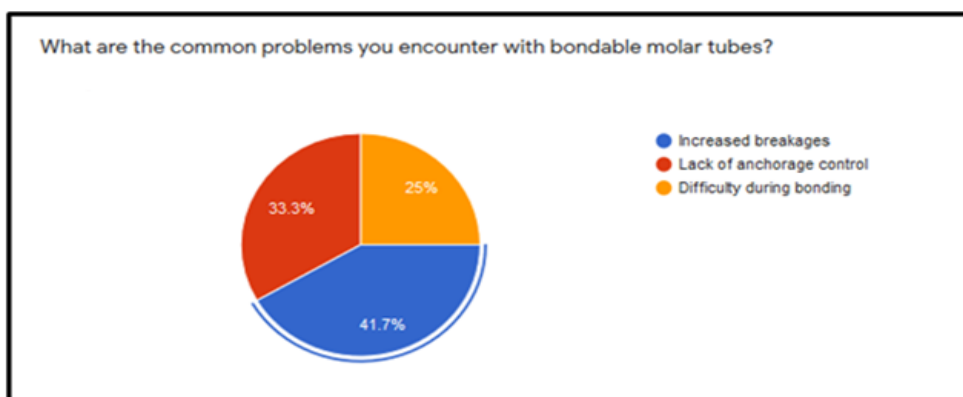
**Fig1.**



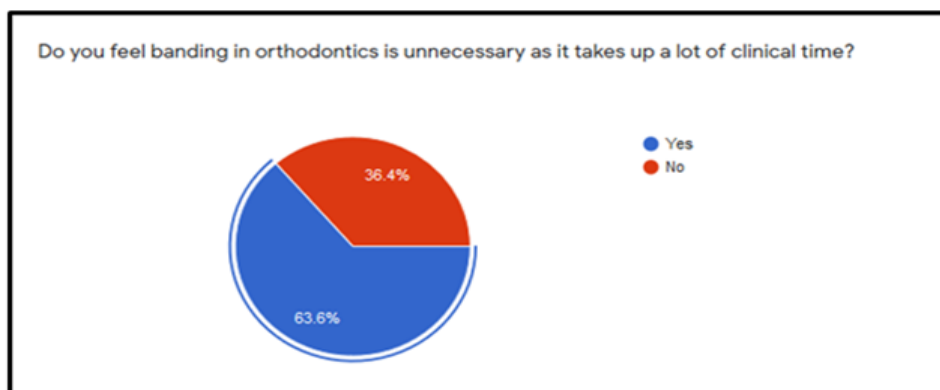
**Fig2.**



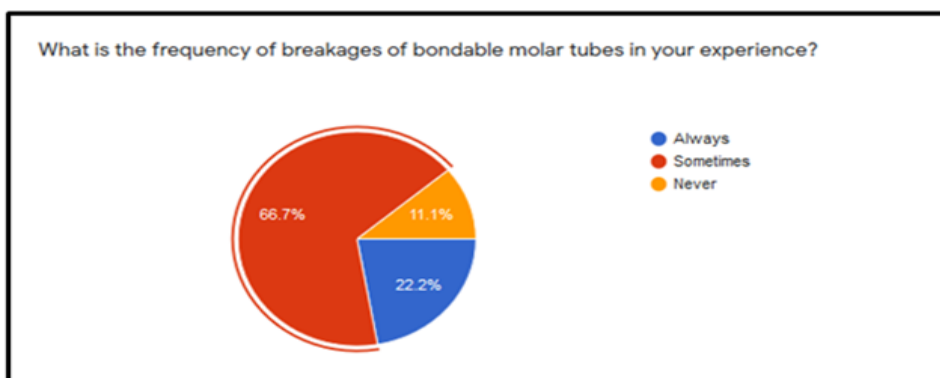
**Fig3.**



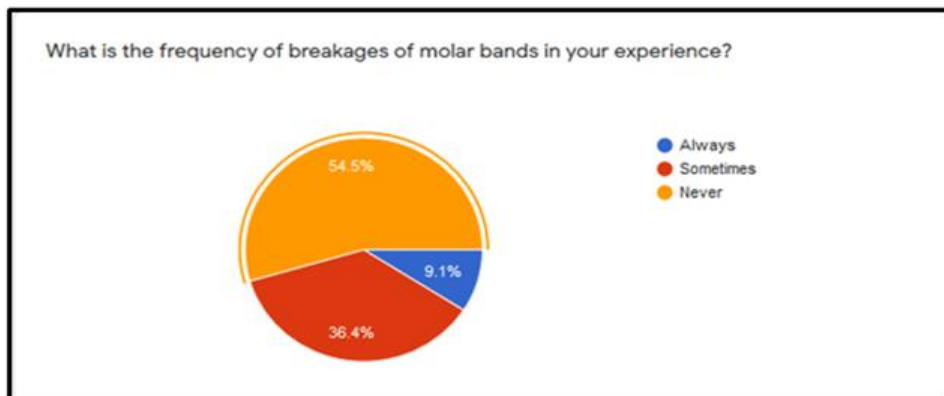
**Fig4.**



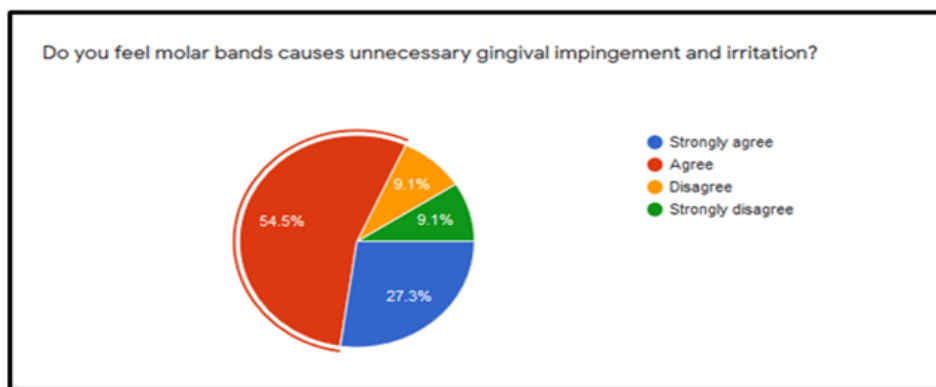
**Fig5.**



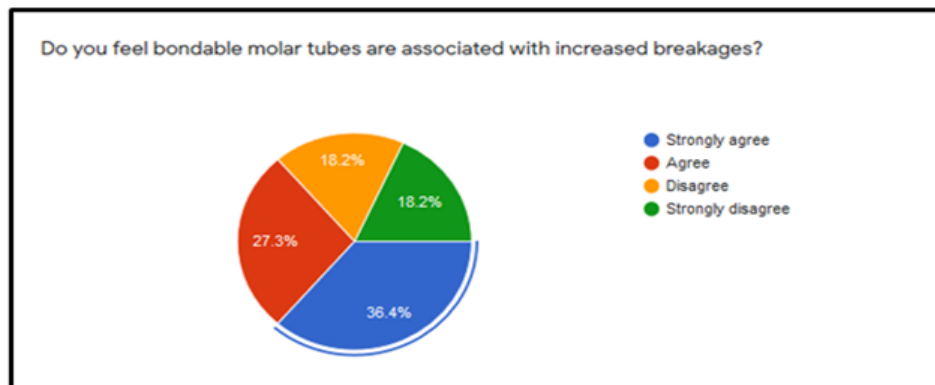
**Fig6.**



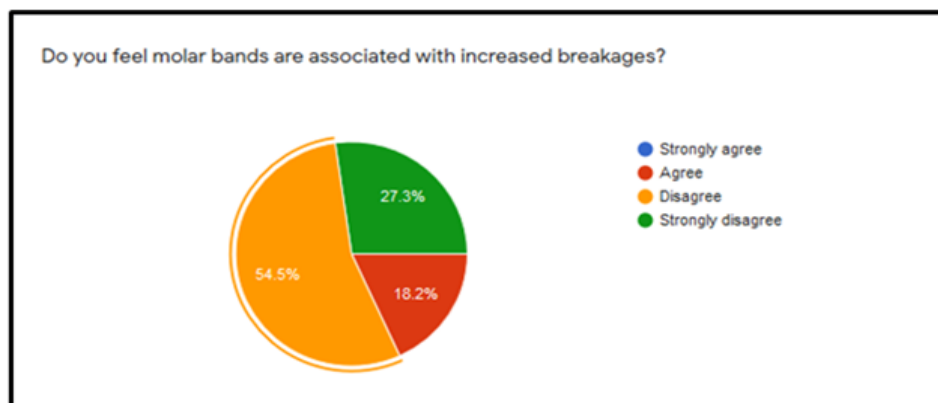
**Fig7.**



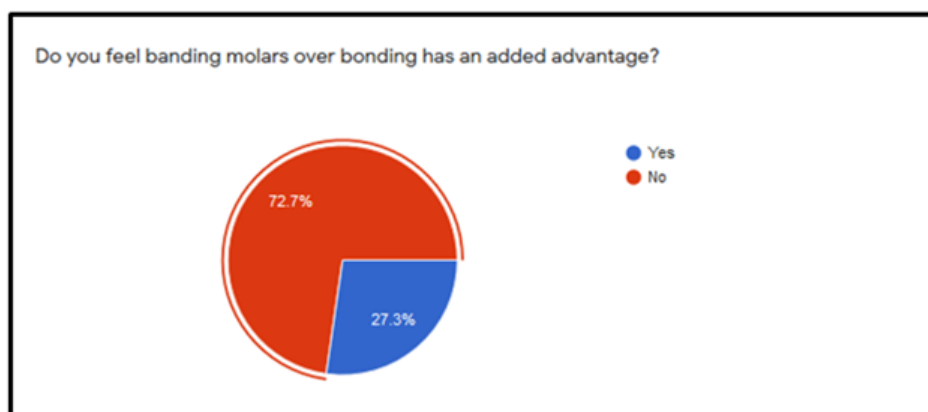
**Fig8.**



**Fig9.**



**Fig10.**



## CONCLUSION

This study reported patient-based outcomes associated with placement of first permanent molar attachments. It would be tempting to postulate banding would be more uncomfortable for patients as the attachment physically surrounds the entire tooth surface and placement can involve trauma to the gingivae; however, no differences were demonstrated between bands and bonds, low levels of discomfort were reported and patients tolerated both types of attachment well. This questionnaire based survey clearly helped in proving that Orthodontists preferred using bondable molar tubes over molar banding in their routine clinical practice as they believed that bondable molar tubes provided benefits that outweighed its drawbacks and thus proved very effective in efficient orthodontic treatment.

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