

Estimation Of Corticotomy Procedures With Or Without Bone Graft

Research Article

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Abstract

The envelope of treatment for predictable non-surgical orthodontics has long been established. However, it is a well-known fact that during orthodontic treatment, bone resorption usually occurs in the direction of tooth movement. The main of this study is to estimate the Corticotomy procedures done with or without bone graft. The study included 19 patients. The data is calculated from Saveetha dental college and recorded. The data was recorded to estimate the Corticotomy procedures done with or without bone graft. The results show most of the corticotomy procedures were done in the age group of 20. Most of the Corticotomy procedures were done in females rather than males. Most of the corticotomy procedures were done without the use of bone graft. From this study it has been concluded that out of 19 patients who had undergone Corticotomy procedures 8 patients had undergone Corticotomy procedures with bone graft.

Keywords: Corticotomy; Bone; Graft; Surgical; Gingiva.

Introduction

The envelope of treatment for predictable non-surgical orthodontics has long been established [1, 2]. However, it is a well-known fact that during orthodontic treatment, bone resorption usually occurs in the direction of tooth movement [3, 4]. Reduced volume of alveolar bone is a complicating factor for orthodontic treatment and numerous previous studies have shown a greater incidence of marginal bone resorption in those areas where the tooth movement was carried out towards the cortical plate [5, 6]. The buccal cortical plate of the alveolus has been for many years considered inviolable and it was thought that any movement beyond that line might cause bony dehiscence and eventually gingival recession [7, 8]. With the introduction of periodontally accelerated osteogenic orthodontics (PAOO®), this concept has very recently been refuted and as shown by Williams and Murphy, the alveolar “envelope” or limits of alveolar housing may be more malleable than previously believed and can be virtually defined by the position of the roots [9, 10]. “Surgically-assisted” orthodontics treatment is referred to in many ways in the literature depend-

ing on the type of surgery that is performed. Wilckodontics®, AOO®, and PAOO® specifically refer to corticotomy surgery when performed in combination with bone grafting which offers the ability to increase the existing alveolar volume, [11, 12] thereby not only potentially minimizing the risk of bone dehiscence and fenestration as side effects of orthodontic movement when occurring outside the bony envelope but also correcting pre-existing dehiscences and fenestrations over vital root surfaces [13-15]. Previously our team has a rich experience in working on various research projects across multiple disciplines [16-30].

Materials And Methods

The present study was conducted in randomly selected 19 patients from the Chennai population. The samples were selected from the department of periodontics Saveetha dental college. It was collected in a methodical manner. It was tabulated in excel and imported to SPSS statistical analysis. Results are obtained and statistically analysed through SPSS software (version 9.0.2.)

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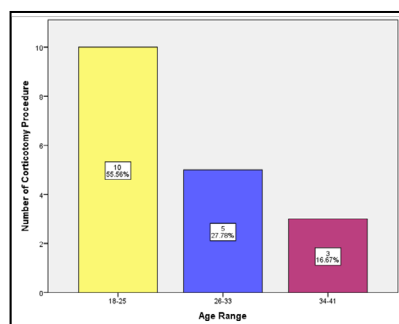
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Results And Discussion

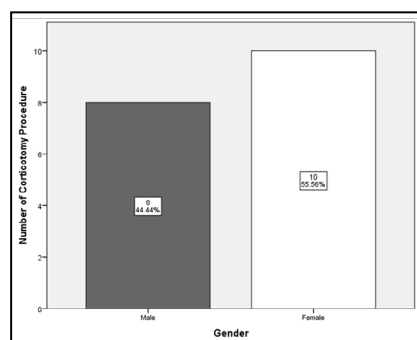
Eighteen patients underwent corticotomy procedures with or without bone graft (sample size; n=18). These 18 patients belonged to the age group 18-25 years (n=10), 26 to 33 years (n=5), 34-41 years (n=3). Most of the corticotomy procedures were done in the age group of 18-25 years (Figure 1). With regard to gender distribution 8 males and 10 females underwent Corticotomy procedures with or without bone graft (Figure 2). According to Figure 3, eight patients (44.44%) underwent Corticotomy with bone graft and 10 patients (55.56%) underwent Corticotomy procedures without the use of bone graft. Figure 4 reveals the association between Corticotomy procedures and the different age groups. Most of the Corticotomy procedures was done with the bone graft in 18-25 years (n=6;33.33%) Corticotomy procedures was done without the bone graft in the age group of 26-33 years (n=3;16.67%) whereas most of the Corticotomy procedures were done without the use of bone graft in the age group of 34-41 years (n=3;16.67%). Figure 5 reveals the association between Corticotomy procedures and gender. Most of the Corticotomy procedures was done with the bone graft in males (n=6;33.33%). However in females, most of the Corticotomy procedures were done with the presence of bone graft (n=5; 45.45%).

Corticotomy has been found to be effective in accelerating orthodontic treatment Wennstrom et al. found that lingual positioning of teeth results in an increase in the gingival height on the facial aspect with a coronal migration of the soft tissue margin in contrast, the opposite occurs when teeth are moved to a more facial position in the alveolar process [31]. While some researchers have found that there is a higher incidence of gingival recession in patients who are orthodontically treated for transverse discrepancy,[32] others have failed to correlate expanding movement and vestibular recessions and found no higher incidence of increased length of clinical crowns post therapy. [33] One hypothesis that has been popularized is that orthodontics per se does not directly cause recession but it creates marginal bone resorption when the tooth is moved outside the bony envelope of the alveolar process, which then leads to soft tissue migration and loss of gingival attachment. This may be observed, for example, even in untreated patients with dental crowding. In these cases, the discrepancy between tooth size and the space available may force some of the teeth outside the bony alveolar housing. Staufer and Landmeser showed that in cases of more than 5 mm of crowding, recession was twelve times more likely to occur. This clearly underlies the importance of achieving proper 3-D positioning of the roots inside the bony alveolar housing after orthodontic treatment. A more recent study evaluated the long-term development of labial gingival recessions during orthodontic treatment and retention phase. In particular, the lower incisors seemed to be more at risk. If the orthodontic treatment is expected to have root movement outside the bony envelope of the original anatomy, orthodontists have historically considered modifying the treatment plan. In our retrospective case series, we found that the possible detrimental effects of orthodontic movements on periodontal tissues can be overcome even when the movements are outside the original alveolar anatomy using a combination of corticotomy and grafting. If corticotomy is performed alone (without GBR), existing alveolar bone volume is not consistently preserved, let alone its augmentation. From this study it had been concluded that most of the corticotomy procedures were done without the use of corticotomy procedure. Our institution is passionate about high quality evidence based research and has excelled in various fields [34-44].

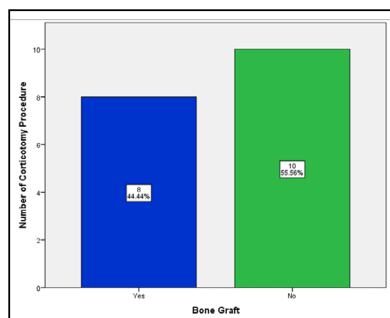
Graph 1: This bar graph shows the frequency distribution of corticotomy procedures and the age range . The X axis denotes the age range and the Y axis denotes the number of corticotomy procedures. This graph denotes that the most of the corticotomy procedures were done in the age group of 18-25 years (55.65%) followed by 26-33 years.



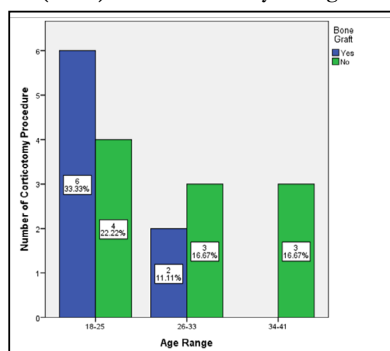
Graph 2: This bar graph shows the frequency distribution of corticotomy procedures and the gender range . The X axis denotes the gender range and the Y axis denotes the number of corticotomy procedures. This graph denotes that the most of the corticotomy procedures were done in females(55.56%) than males.



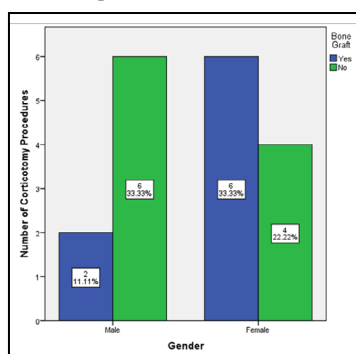
Graph 3: This bar graph shows the frequency distribution of corticotomy procedures done with or without bone graft. The X axis denotes the with or without bone graft and the Y axis denotes the number of corticotomy procedures. This graph denotes that the most of the corticotomy procedures were done without the usage of bone graft (55.56%).



Graph 4: This bar graph shows the association of corticotomy procedures and the age range. The X axis denotes the age range and the Y axis denotes the number of corticotomy procedures. This graph denotes that most of the Corticotomy procedures were done with the usage of bone graft at the age group of 18-25 years and in the 34-41 year age group, most Corticotomy procedures were done without the usage of bone graft. Chi square test was done and the association of corticotomy procedures and the association tend to be statistically not significant. Pearson 's Chi square value= 5.715,df = 5, p value 0.335(>0.05) hence statistically not significant.



Graph 5: This bar graph shows the association of corticotomy procedures and the gender range. The X axis denotes the gender range and the Y axis denotes the number of corticotomy procedures. Most of the Corticotomy procedures were done without bone graft in males, most of the Corticotomy procedures with bone graft in females. Pearson 's Chi square value=22.450,df =4,p value 0.001(<0.05) hence statistically significant.



Conclusion

From this study it has been concluded that most of the Corticotomy procedures were done without the use of bone graft. The Corticotomy in combination with guided bone regeneration can increase the scope of conventional treatment following expensive movements beyond the traditional envelope of predictability.

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Author contributions

- Design - sai charan, Nashra khareem
- Intellectual content - Nashra khareem

- Data collection - Sai charan
- Data analysis - Nashra khareem, Kiran Kumar
- Manuscript writing - Sai charan
- Manuscript editing - Nashra khareem, Kiran Kumar

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