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COMPARISON OF TRANSBUCCAL VERSUS TRANSORAL APPROACHES FOR MANAGEMENT OF MANDIBULAR ANGLE FRACTURE

Dr Syed Abdul Rauf Shah[1], Dr Abdul Samad Gichki[2*], Dr Aysha Sadaf[3], Dr Anosha Mujtaba[4], Dr Hamid Rahman Tipuo[5], Dr Muhammad Umair[6]

[1]Professor, Maxillofacial Surgeon, Dentistry / Oral & Maxillofacial Department, Quetta, Pakistan
[2*]Associate Professor & Hod, Oral Medicine, Dental College, Sandeman Provincial Hospital Quetta, Pakistan
[3]Associate Professor. FCPS Prosthodontics. Shifa College of Dentistry Islamabad, Pakistan
[4]Senior Registrar, Oral and Maxillofacial Surgery, School of Dentistry, SZABMU, Islamabad, Pakistan
[5] PGT, OMFS, Islamic International Dental Hospital, Islamabad
[6]Assistant Professor, Oral Medicine, Foundation University School of Health Sciences

***Corresponding author:** Dr Abdul Samad Gichki,
[*]Associate Professor & Hod, Oral Medicine, Dental College, Sandeman Provincial Hospital Quetta, Pakistan

Abstract:
Objectives: To comparison the outcomes of Transbuccal versus Transoral approaches for Management of Mandibular Angle Fracture.
Materials and Methods: This comparative observational study was conducted at Shifa College of Dentistry Islamabad, Pakistan. The study duration was 6 month from Nov 2023 to April 2024. A total of 62 patients who met the inclusion criteria were enrolled in the study. These patients were divided into two groups: Group A underwent the transoral approach, while Group B underwent the transbuccal approach. Radiographs were utilized to evaluate fracture displacement and type, and blood tests were conducted as part of preoperative assessment. Prior to surgery, patients received antibiotics to prevent infection. Erich's arch bars were placed one day before surgery to ensure occlusal stability. Following surgery, thorough follow-up was conducted, and patients were given postoperative instructions to aid in their recovery process.
Results: In this study, a total of 62 patients were enrolled, divided into two groups, with a mean age of 30.90 ± 7.68 years. The number of male patients in Group A and Group B were 14 (45.2%) and 19 (61.3%), respectively, while the number of female patients were 17 (54.8%) and 12 (38.7%), respectively, with a P-value of 0.20. Surgical access ease was found to be insignificant between both groups. The gap between fracture segments was smaller in the transbuccal group than in the transoral group, with a p-value of 0.00. The mean surgical times for Group A and Group B were 51.29 ± 1.79 and 59.19 ± 2.35, respectively. Scarring was observed in the transbuccal group.
Conclusion: Even though both methods were similar in many aspects, the transbuccal approach proved to be more effective for treating mandibular angular fractures.

Key words: Transbuccal, Transoral approaches, Mandibular Angle Fracture.

INTRODUCTION:

Mandibular angle fractures are common among facial bone injuries and often necessitate surgical intervention for proper management.(1, 2) In recent years, the debate over the optimal surgical approach for treating mandibular angle fractures has intensified, with the transbuccal and transoral approaches emerging as primary contenders.(3) The elevated occurrence of fractures in the angle of the mandible can be ascribed to several anatomical factors.(4) One contributing factor is the comparatively thinner cross-sectional area of the mandibular angle relative to adjacent segments, rendering it more susceptible to traumatic forces.(5) Additionally, the curvature of trajectories in the angle region may predispose it to fractures, particularly under certain impact patterns. Furthermore, the presence of third molars, especially impacted ones, can further compromise the structural integrity of the mandibular angle, increasing the likelihood of fractures in this region. These combined anatomical considerations underscore the vulnerability of the mandibular angle to injury and emphasize the importance of effective management strategies for fractures in this area.(6) Numerous comparative studies have investigated the effectiveness and results of both transbuccal and transoral approaches in managing mandibular angle fractures.(7-9) While certain studies have found no significant differences in outcomes between these two approaches, others have indicated the superiority of one approach over the other concerning specific parameters such as fracture reduction, surgical duration, and complication rates. Ultimately, the decision between transbuccal and transoral approaches is typically influenced by factors including the surgeon's discretion, fracture complexity, and individual patient attributes. By comparing these two approaches, the study aims to provide valuable insights into their respective efficacy, safety, and outcomes, thereby guiding clinicians in making informed decisions regarding fracture management strategies. Ultimately, the study seeks to contribute to the advancement of evidence-based practice in the field of oral and maxillofacial surgery and improve patient care and outcomes.

Objective: To compare the outcomes of Transbuccal versus Transoral approaches for Management of Mandibular Angle Fracture.

MATERIALS AND METHODS:

Study Design: Comparative observational Study setting: Shifa College of Dentistry Islamabad, Pakistan.

Duration of the study: The study duration was 6 month from December, 2021 to December, 2022.

Inclusion Criteria:

- Patients with mandibular angle fracture.
- Patients of 18-65 years of age.

Exclusion Criteria:

- Patients with contrandications to either the transbuccal or transoral approach, such as severe trismus, intraoral pathology obstructing surgical access, or compromised medical conditions that increase surgical risks.
- Patients with uncontrolled diabetes, severe cardiovascular diseases, or immunocompromised states.
- Patients with infections, pathological fractures, or comminuted fractures.

Methods:

This comparative observational study was conducted at Shifa College of Dentistry Islamabad, Pakistan from December, 2021 to December, 2022 after obtaining approval from hospital ethical committee. A total of 62 patient fulfilling the inclusion criteria were enrolled. The patients were divided in to two groups (group A= transoral approach; group B= transbuccal approach). In the Transbuccal Approach Group, patients received surgical treatment for mandibular angle fractures via the transbuccal approach, which entailed accessing the fracture site through an incision in the buccal mucosa. Conversely, in the Transoral Approach Group, patients underwent surgical management of mandibular angle fractures using the transoral approach, which involved accessing the fracture site

via an incision made intraorally. Radiographs were recommended to assess fracture displacement and type. Blood tests were carried out. Before surgery, patients received antibiotics. Erich's arch bars were placed a day prior to the surgery to ensure occlusal stability. After the surgery, thorough follow-up was conducted, and patients were provided with instructions. All the patients were followed after 6 month. For statistical analysis we used SPSS Version 26.

RESULTS:

In this study total of 62 patients, divided in to two groups, with mean age of 30.90±7.68 years were enrolled (Table 1). Each group had 31 patients with mean age of 31.06±6.77 and 30.74±8.61 years respectively with insignificant P-value of 0.87. The number of male patients in group A and group B were 14(45.2%) and 19(61.3%) respectively while that of female patients were 17(54.8%) and 12(38.7%) with P-value of 0.20. The ease of surgical access were found insignificant between the both groups. The gap was less in the transbuccal group than the transoral group with p-value of 0.00. The mean surgical time of group A and group B were 51.29±1.79 and 59.19±2.35 respectively. Scarring was found in transbuccal group.

Table 1: Mean age of all enrolled Patient *(n=62)*

Variables	Mean±SD
Age (Years)	30.90±7.68

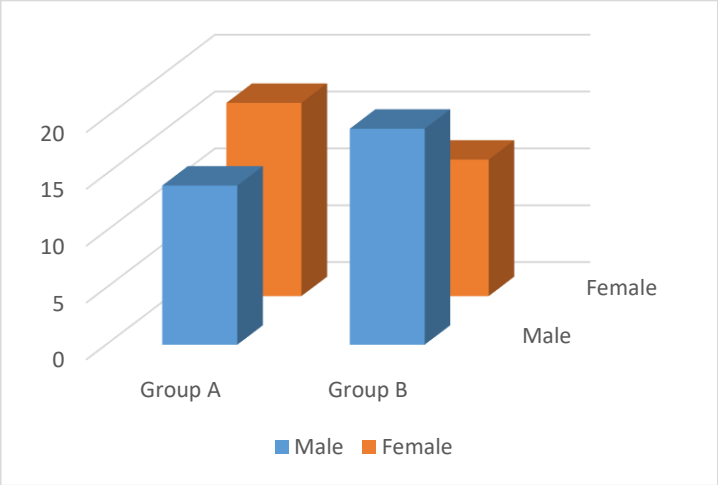

Fig: Frequency of gender in both groups.

Table 1: Different parameter of both group post surgically *(n=62)*

Variables	Groups		p-value
	Transoral	Transbuccal	
Age (Years)	31.06±6.77	30.74±8.61	0.87
Gender			
Male	14(45.2%)	19(61.3%)	0.20
Female	17(54.8%)	12(38.7%)	
Ease of surgical access	21 (total score)	22 (total score)	0.64
Surgical time	51.29±1.79	59.19±2.35	0.00
Evaluation of fracture gap postreduction	0.50±0.109	0.25±0.096	0.00
Scarring	ABSENT	PRESENT	----

Discussion:

Mandibular angle fractures are common in maxillofacial trauma, presenting a challenge in terms of optimal surgical approach for management. Among the various surgical techniques available, the

transbuccal and transoral approaches stand out as primary options. Both techniques have their merits and demerits, and understanding their comparative effectiveness is crucial for informed decision-making in clinical practice. The aim of the present study was to compare the outcomes of Transbuccal versus Transoral approaches for Management of Mandibular Angle Fracture. The finding that the fracture gap postreduction was less in the transbuccal group compared to the transoral group, with a p-value of 0.00, carries important implications for the treatment of fractures. Firstly, this result suggests that the transbuccal method may be more effective in achieving optimal alignment and closure of the fracture gap following reduction compared to the transoral method. This is significant because proper reduction of fractures is crucial for facilitating healing and restoring function, while minimizing the risk of complications such as malunion or nonunion. Our study finding was supported by the study conducted by Kritika Sehrawat et al.(10) The progression of surgical methods in managing fractures, notably with the introduction of miniplates as advocated by Champy, has revolutionized the field. These advancements empower surgeons to achieve precise anatomical alignments utilizing a transbuccal approach.(11) Through accessing the fracture site via the buccal (cheek) region, surgeons can meticulously position miniplates to stabilize the fracture, thus promoting optimal healing and functional recovery. Despite the potential merits of the transbuccal approach, its widespread adoption remains constrained. A key concern revolves around the perceived risk of nerve injury during the procedure.(11, 12) The buccal region harbors crucial nerves such as the facial nerve, governing facial expressions, and branches of the trigeminal nerve, responsible for facial sensation. Damage to these nerves may result in temporary or permanent functional impairments, including paralysis or sensory deficits. Furthermore, aesthetic considerations are raised regarding the outcome of the transbuccal approach. Incisions made in the buccal region could lead to noticeable scarring, particularly concerning patients in aesthetically sensitive areas like the face. These deliberations emphasize the necessity for a judicious approach in selecting the most suitable surgical technique for each case. While the transbuccal approach offers advantages in achieving precise anatomical reductions, surgeons must carefully balance these benefits against the potential risks of nerve injury and aesthetic repercussions. Various surgical methods, including intraoral transvestibular incision, extraoral submandibular/retromandibular, or transbuccal approaches, are utilized for performing open reduction and internal fixation in managing angle fractures.(11-16) The assessment of these surgical techniques entails considering multiple factors such as ease of use, duration of the procedure, accessibility, and requisite surgical expertise. Numerous studies have been conducted to compare these distinct approaches, particularly concerning angle fractures. These comparative analyses aim to elucidate the advantages and drawbacks of each method, aiding surgeons in making well-informed decisions regarding the most appropriate technique for individual patients. Through the evaluation of parameters such as surgical duration, postoperative complications, aesthetic results, and functional recovery, researchers endeavor to identify the approach that offers the most favorable balance of benefits for angle fracture patients. By systematically scrutinizing these surgical methods across various studies, healthcare professionals can gain deeper insights into their respective merits and limitations, thus advancing patient care and surgical outcomes. This evidence-driven approach to assessing surgical techniques fosters continuous enhancement and refinement in fracture management protocols. The selection of treatment is contingent upon several factors, including the anatomical site of the fracture line, the specific type of fracture, the patient's dentition, and the degree of displacement of the fractured segments.(13, 14) The extraoral approach offers a clearer operative field, studies have indicated that the transbuccal approach tends to result in fewer complications.(17) The transbuccal approach is often preferred because it leads to minimal or absent scar formation and allows for direct visualization and confirmation of proper occlusion during plate fixation.(6)

The transbuccal approach has demonstrated superiority over the transoral approach across several key aspects of fracture management. Firstly, it excels in achieving radiographic reduction of the fracture gap, leading to more precise alignment of fractured segments. Additionally, this approach offers the advantage of inconspicuous external scarring, a significant aesthetic benefit for patients. Moreover, studies have consistently reported fewer postoperative complications associated with the transbuccal approach compared to its transoral counterpart. The preference for the transbuccal

approach is further supported by its ease of use, reduced need for plate bending, and facilitation of plate placement in the neutral mid-point area of the mandible. These combined advantages make the transbuccal approach a preferred choice in fracture management, offering improved outcomes and patient satisfaction.(18)

CONCLUSION:

Both methods demonstrate similarity, yet the transbuccal approach showcased effective reduction in postoperative fracture gap, minimal scarring, and reduced complications without facial nerve damage. Minimal plate bending facilitated plate positioning at the neutral zone. Conversely, the intraoral approach presented no external scarring, ease of use, and Champy-recommended plating at the external oblique ridge, facilitating miniplate placement in the mandible angle's tension area. Despite statistically similar outcomes, our study leans towards the intraoral approach due to its shorter surgical duration. Larger sample size studies are warranted for validation.

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