Case Report

Comparative Study Between Fabricated Surgical Guides And Using Roots Of Molar Teeth As A Guide In Immediate Implant Placement In Fresh Extraction Socket: Prospective Clinical Study

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ABSTRACT

Aim of study : The aim of the study was to compare between fabricated surgical guides and using roots of molar teeth as a guide in immediate implant placement in terms of Stability and Accuracy. Patients and Methods: A prospective clinical study was used in this investigation. 20 patients were divided into two groups: 10 immediate implants were inserted in group (A) study group using interradicular bone drilling between roots of molar teeth, and 10 immediate implants were placed in group (B) using prefabricated surgical guide, CBCT done immediately postoperative to evaluate implant accuracy, Osstell was utilized to ascertain the intraoperative primary stability and secondary stability six months later. Results: 18 implants were successfully functioning in both groups (A,B), For implant accuracy, there was no statistical significance between two groups (A,B) . Also for the implant stability, there was no statistical significance between two groups (A,B). Conclusions: Interradicular bone drilling teqnique increases implant position accuracy, stability, and operation feasibility very similar to prefabricated surgical guide, which demonstrated only slight increase in Stability and Accuracy. keywords: Immediate implant placement, intraradicular drilling technique, conventional. fabricated surgical guides. Running title: Various methods for immediate posterior mandibular implants

Key Words : Immediate implant placement, intraradicular drilling technique, conventional. fabricated surgical guides

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INTRODUCTION

The placing of an implant in newly extracted socket reveal excellent success rates and offer a useful and reliable method for replacing teeth that are beyond repair. Immediate implant, is referred to as "same day immediate implant," and it was initially defined by Schulte in 1976, more than 40 years ago. [1] [2]. Recently, software-guided implant treatment planning is frequently used to direct the surgeon in precisely placing the implant because of advancements in implant imaging technology. The positions, angulations, and depths of implant sites are among the crucial details that computed tomography (CT) may give surgeons to help them plan implant placement more precisely [3] . As drilling is done without any obstructions, unlike with surgical guides , the well-separated roots were recently used as a guide to produce an optimal implant site position with precise buccolingual, mesiodistal direction, appropriate angle, and exact measuring of osteotomy depth , A number of clinical difficulties arise when implants are placed immediately at the maxillary and mandibular molar regions because of site-specific anatomical features including wide extraction sockets or decreased bone heights apical to the socket fundus [4].When interradicular bone septa are

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present, implant bed preparation could be difficult. Since the osteotomy drill may deflect from the ridge or surface of the bone septa, this is a clinically demanding operation that makes it difficult to place implants optimally for both prosthetic and hygienic reasons [5].Therefore, by engaging the interradicular septum, the implant should be positioned in the middle of the extraction socket. In order to use the morphology of the root trunk to guide the drilling process into the interseptal bone of the socket, a surgical technique that involves inserting the implant into the interseptal/inter-radicular bone of a multirooted posterior tooth extraction socket must be taken into consideration [6]. Mini-invasive procedures frequently eliminate the need for surgical flaps thanks to guided implant implantation. Implant insertion during surgery, a prefabricated prosthesis based on intended implant position, the ability to connect newly placed implants, and the ease with which a functional and aesthetically pleasing instant loading can be achieved are other benefits of guided procedures[7]. However, there are drawbacks to implant-guided surgery as well, which need to be carefully considered. First of all, as with any new technique, this kind of surgery necessitates a longer learning curve for the technician, the dentist, and the entire dental team whoch is time-consuming in contrast to conventional procedures. Economic factors as templates and forming instruments must also be assessed [8] . The entire stability of an implant is typically broken down into two stages: primary stability, which occurs during implant placement, and secondary stability, which occurs after healing. While secondary implant stability is the consequence of biologic processes (osseointegration), primary implant stability has been shown to be a mechanical pheno menaThe integration of implants into the osseous tissues and the production of new bone are key factors in implant stability, particularly secondary stability. Numerous elements that affect the rate and success of osseointegration can be divided into two categories: those pertaining to implant characteristics, such as the physical and chemical macro- and micro-design of implants, or those pertaining to bone characteristics, such as the quantity and quality of bone, the host conditions both locally and systemically, or the time or procedure used for the dental implant's functional loading. Continuous and accurate monitoring of the osseointegration status is necessary to resolve any deficiencies in osseointegration caused by any of the variables[9]. The linear positional or angular discrepancy between the intended and actual positions is what is used to define the implant guide's accuracy. From the time imaging data is gathered to the implant's final surgical placement, mistakes can happen[10].Two cone-beam computed tomography (CBCT) or multilayer computed tomography (MSCT) scans were used to quantify the matching ratio between the intended and actual implant placements, achieving overlap measures between preoperative planning and postoperative implant position. There is always a discrepancy between the implant's virtual planning and its actual in vivo location [11] . Interradicular bone drilling technique has several benefits since we precisely put the implant in a location that is optimally prosthetic by using the retained roots as a template. Additionally, it stops the drills from slipping in the extraction sockets, which happens with the conventional method. Additionally, it prevents the surgical difficulties of limited interocclusal distance in the posterior segment, which arises when surgical guides are used and prevents the drills from being inserted through the surgical guide. Furthermore, this method is less expensive than the computer-guided implant placement method. Among the technique's drawbacks are the increased hardness of the root tissue, which could lengthen the clinical period, the increased risk of raising the bone temperature at the osteotomy site, and the potential to interfere with the natural healing process due to the leftover dental tissue from drilling [12] The aim of the study was to compare between fabricated surgical guides and using roots of molar teeth as a guide in immediate implant placement in terms of Stability and Accuracy -

Patients and Methods

Ethical regulation:

All treatment procedures, complications, and treatment outcomes were explained for patients. Informed consent that lay down by research ethics committee at Faculty of Dentistry-Minia University was submitted by the patients to participate in the study before data collection.

Study design:

It was a prospective randomized clinical study

Sample size:-

Sample size calculation:

By using G*Power software (v3.1.9.7)(8), sample size estimation was carried out, and it was found that 20 implants (10 per group) would offer adequate statistical strength. Total of 20 implants was used to our patients of outpatient clinic of Oral and Maxillofacial Surgery Department in Faculty of Dentistry, Minia University. Patients were divided into 2 groups (10 implants per group). Group A (Study group): 10 implants placed immediately after atraumatic molar extraction (coronectomy, separation and drilling) using the tooth roots as a guide in molar tooth Group B (Control group): 10 implants placed immediately after atraumatic molar extraction using fabricated surgical guide

Patient selection

Eligibility criteria

Inclusion criteria:

- Patients with hopeless lower first or second molar need for extraction; sockets that have an interradicular septum at least height 2.5 mm and adequate thickness .
- Integrity of the roots (the body of the roots will guide the drill to the center of the interradicular septum), for that it is important that the roots count with adequate structure.
- Aged between 20 and 45 years old.
- Good oral hygiene.

Exclusion criteria :

- Patients with systemic disease that may affect bone quality.
- Patients with poor oral hygiene and active periodontal diseases.
- Unfavorable position of the tooth or remaining roots as severly dilacerated .
- Roots ankylosis and fused rooted teeth .
- Single rooted teeth.

Preoperative evaluation:

For each patient, a clinical examination was performed and the following clinical data was collected:-

- Detailed case history (subject age, gender, medical history, chief complaint and history of chief complaint).
- Extra, intra-oral and neck examinations was performed.
- Assessment of general health status was conducted to ensure that the patient can withstand surgery under local anesthesia.
- Pre-operative impression for detection of proper inter arch space.

Radiographic examination:

Preoperative CBCT was used to plan the implant and examine the interradicular bone, pathological lesions surrounding the apex, and the inferior alveolar canal approximation (Planmeca Promax 3D Mid - Asentajankatu, Helsinki, Finland) (Figure 1).

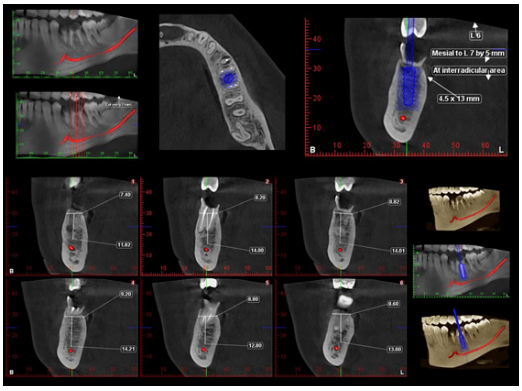


Figure1: Preoperative CBCT was used For implant planning

Asurgical guide was fabricated to create the tooth-supported surgical guide, using a computer program (On Demand 3D App) (Figure2).

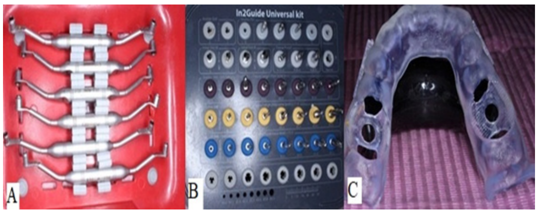


Figure 2: (A and B) In2Guide Drill Guides,In2Guide Guided Drills (C) Fabricated sterolithic the tooth-supported surgical guide.

Surgical phase:

A preoperative antibiotic 1 hour was given to the patient ,mouth rinsing (chorohehexidine) then administration of local anesthesia. The standard technique of implant insertion was followed (low speed drilling with high torque motor, successive drilling, and double coolant under strict aseptic condition). Implants were manually inserted with the torque wrench until flushing with bone level. External coolant was applied during tightening the implant to avoid overheating the bone.

a hole was made in the center of the hopeless molar using a round bur to level the bone. The first drill, known as the pilot drill, was used to make the initial position of the osteotomy in the furcal bone through the central access. The second drill was then used. The remaining roots were extracted artificially, and then the drilling process and implant placement was continued .ISO MED dental implant Italy system is inserted, length range from 8 to11.5 and diameter range from 4.5 to 5.5 for all cases in group (Figure 3).

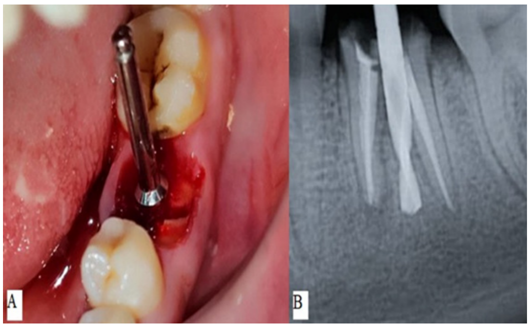


Figure 3 : Tooth guided immediate implant placement technique (A): After coronectomy and root separation of the tooth a photograph showing sequential drilling between roots for verification of the osteotomy position. (B) Periapical x-ray verifying correct osteotomy position.

For group B: A surgical bur was used to separate the roots. After that, the roots were extracted atraumatically. Following tooth extraction, saline was used to wash away any debris. Following the instructions in the guided kit, the tooth-supported surgical guide was then inserted, allowing the osteotomy to be drilled into the interradicular bone. The implant placement was placed in the spot that had been prepared. ISO MED dental implant Italy system is inserted lenghth rang from 8 to11.5 and diameter rang from 4.5 to 5.5 for all cases in group (Figure 4).

Figure 4: Prefabricated surgical guided immediate implant placement technique (A): Aphotograph showing prefabricated surgical guided on molar before extraction (B) Aphotograph showing drilling through prefabricated surgical guided.

Evaluation of Primary Stability was assessed using the Osstell device. for all patients Osstell TM device (Osstell ABStampgatn 14-SE 411 01 Goteborg, Sweden) and using for measurement SmartPegs (ISOMED smartpegs, Italy) (Figure 5) Bone grafts were used to fill the empty sockets around the implant and covered by customized healing abutment in all patients.After six monthes Secondary Stability was measured also by Osstell device.

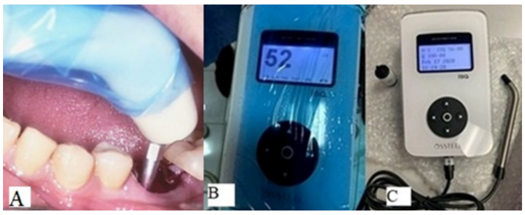


Figure 5: Photographs (A,B and C) showing Primary Stability measurement through Ostell device and Smartpeg.

Post operative procedures:

CBCT was done immediately after implant placement to evaluate the implant site depth, All patients were advised to apply extra-oral cold packs for 15 minutes every hour on the first day. Postoperative drugs were prescribed, including oral antibiotic .Throughout two weeks, patients were advised to follow stringent oral hygiene guidelines and rinse their mouths often.

Radiographical assessment :

Following surgery, an immediate post-operative CBCT was conducted using the same equipment and parameters as the pre-eoperative CBCT. The intended implant position on the pre-operative CBCT was compared with the actual implant position on the immediate post-operative CBCT to evaluate the Accuracy of implant placement, Assessment of Accuracy ; on the same quadrant, CBCT was carried out twice: once before surgery to use software to build virtual implants and once just after surgery to compare the position of the simulated expected implant to the real implant. Next, the two CBCTs the real implants and the hypothetical planned implants were superimposed on one another. Using a software program (On Demand 3D App), three deviation parameters (coronal, apical, and angular deviations) were computed between the planned and actual implants (Figure 6).

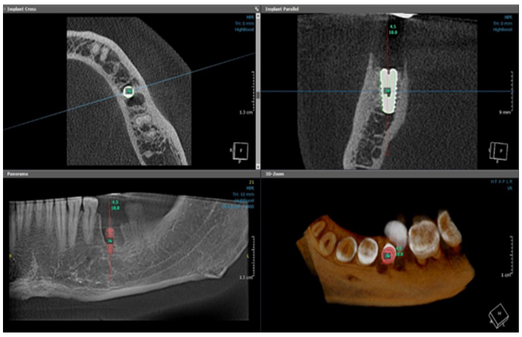


Figure 6: Assessment of Accuracy. On the same quadrant; CBCT was carried out twice: once before surgery to use software to build virtual implants (red color) and once just after surgery to compare the position of the simulated expected implant to the real implant(whitecolor).

Evaluation the Secondary Implant Stability ; after six months the Secondary Implant Stability was assessed using the same Osstell device.

STATISTICAL ANALYSIS:

Shapiro Wilk test was used for testing the Normality of data. Statistical evaluation was performed using the SPSS -Statistical analysis for non-normal distributed data (different accuracy parameters) was performed by Mann-Whitney Test for pairwise comparisons between groups.statistical package (Version 25, IBM Co. USA).

RESULTS:

(I)Demographic data of Study group

This study included 20 patients, with demographic data analyzed for both groups. In Group A, 40% of the participants were male, and 60% were female, whereas Group B had an equal gender distribution (50% male and 50% female). A Chi-square (X^2) test revealed no significant difference in gender distribution between the two groups. Regarding age, the mean age in Group A was 33.7 ± 7.6 years (range: 22–45 years), while in Group B, it was 37.0 ± 6.65 years (range: 22–45 years). An independent T-test indicated no significant difference in the mean age between the two groups.

Table (1): Demographic data distribution of the study group:

Demographic Data	Group A	Group B	P-Value*
Sex			0.510NS
Male	4 (40 %)	5 (50 %)	
Female	6 (60 %)	5 (50 %)	
	Range	Mean ±SD	
Age (years)	33.7±7.6 (22-45)	37.0±6.65 (29-45)	0.287NS

* P-value for Inter-group comparison between the two-groups calculated from Chi-square (X^2) test for Gender distribution and from Independent T-Test in Age comparison

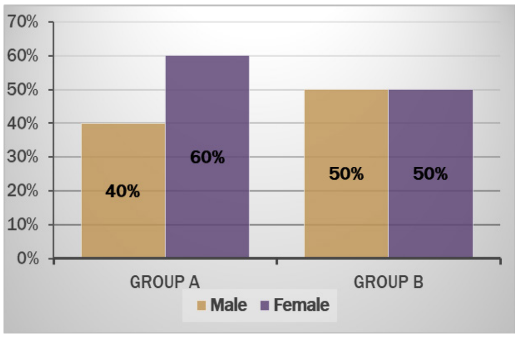


Figure (7): A bar chart representing the Gender distribution for both groups.

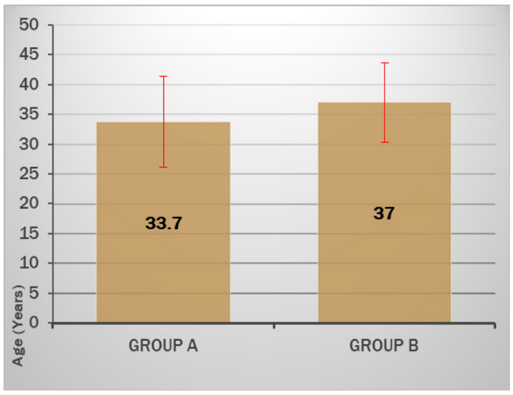


Figure (8): A bar chart representing the Mean and SD of age for the two groups.

(II)Evaluation of total Accuracy

The preoperative and postoperative CBCT scans were overlapped using a dedicated algorithm, which allowed the comparison of the virtually planned and the actual implant positions. Three deviation parameters between each planned and placed implant were measured. All measurements were performed using dedicated software (OnDemand3D™). Horizontal (linear) deviation at coronal and apical sides of the implant, Coronal and apical differences were measured in mm, while the angular deviation was measured in degrees. Though several methods were used to describe the distance between the given points, the most common method was to measure the actual distance between the planned and actual point in the x, y, and z-axis, where x = bucco-lingual, y = mesio- distal, and z = apico-coronal deviation. The apico-coronal

•Evaluation of Angular deviation

The angular deviations is the angle formed between the long axis of the placed implants and the long axis of virtual implants .

1.Basic Descriptive statistics of different Accuracy parameters

Table (2): Basic descriptive statistics of different accuracy parameters for the two groups studied.

		Mean	SD	Median	Min	Max
Degree Diff	Group A	4.98	3.10	6.06	0.00	8.95
	Group B	4.32	2.35	3.99	1.24	7.87
Coronal Diff Sum	Group A	1.96	0.68	2.00	0.45	2.65
	Group B	1.54	0.46	1.53	0.91	2.50
Coronal Diff DX	Group A	0.80	0.61	0.42	0.14	1.64
	Group B	0.76	0.39	0.63	0.07	1.38
Coronal Diff DY	Group A	0.65	0.64	0.45	0.13	1.83
	Group B	0.52	0.51	0.27	0.18	1.67
Coronal Diff DZ	Group A	0.61	0.64	0.26	0.05	1.81
	Group B	0.60	0.69	0.15	0.11	1.79
Apical Diff Sum	Group A	1.58	0.81	1.55	0.45	3.00
	Group B	1.32	0.76	1.60	0.42	2.65
Apical Diff DX	Group A	1.49	0.75	1.36	0.38	2.64
	Group B	1.15	0.52	1.24	0.11	1.6
Apical Diff DY	Group A	0.86	0.86	0.52	0.03	2.24
	Group B	0.74	1.03	0.24	0.03	2.95
Apical Diff DZ	Group A	0.59	0.44	0.38	0.19	1.22
	Group B	0.52	0.71	0.053	0.03	1.75

2.Effect of group type on the Mean of total Accuracy (Inter-group comparison)

Table 3 presents the comparative analysis of Accuracy parameters between Group A and Group B. The results showed the following Mean (±SD) values:

- Degree Diff: 4.98±3.1 degree(Group A) vs 4.32±2.35 degree (Group B)
- Coronal Diff Sum: 1.96±0.68 mm vs 1.54±0.46 mm
- Coronal Diff DX: 0.8±0.61 mm vs 0.76±0.39 mm
- Coronal Diff DY: 0.65±0.64 mm vs 0.52±0.51 mm
- Coronal Diff DZ: 0.61±0.64 mm vs 0.62±0.69 mm
- Apical Diff Sum: 1.58±0.81 mm vs 1.32±0.76 mm
- Apical Diff DX: 1.49±0.75 mm vs 1.15±0.52 mm
- Apical Diff DY: 0.86±0.86 mm vs 0.74±1.03 mm
- Apical Diff DZ: 0.59±0.44 mm vs 0.52±0.71 mm

According to the Mann-Whitney test for comparison between the two groups, the difference between the two groups was not statistically significant for all accuracy assessment parameters.

Table (3): Mean ±SD and Inter group comparison of different Accuracy parameters between the two studied groups.

	Group A	Group B	P-value*
Degree Diff	4.98±3.1	4.32±2.35	0.623NS
Coronal Diff Sum	1.96±0.68	1.54±0.46	0.069NS
Coronal Diff DX	0.8±0.61	0.76±0.39	0.650NS
Coronal Diff DY	0.65±0.64	0.52±0.51	0.849NS
Coronal Diff DZ	0.61±0.64	0.60±0.69	0.363NS
Apical Diff Sum	1.58±0.81	1.32±0.76	0.544NS
Apical Diff DX	1.49±0.75	1.15±0.52	0.082NS
Apical Diff DY	0.86±0.86	0.74±1.03	0.572NS
Apical Diff DZ	0.59±0.44	0.52±0.71	0.880NS

-** P-value for Inter-group comparison between the two-groups (Mann-Whitney test).
- S= Statistically significant at P ≤ 0.05 - NS= Non-significant P < 0.05.
- HS= Highly significant at P ≤ 0.001

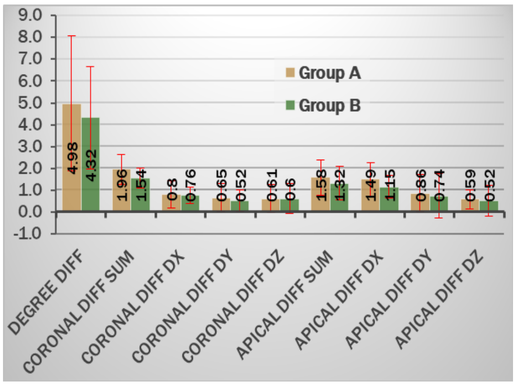


Figure (9): A bar chart representing the Mean and SD of different Accuracy parameters for the two groups different time intervals.

(III)Evaluation of Implant Stability

Implant stability measured by Osstell device immediately and after 6 months. Results from Resonance Frequency Analysis (RFA) were based on repeated measurements per implant at 0 and 6 months

Basic Descriptive statistics of Implant Stability

Table (4): Basic descriptive statistics of Implant Primary Stability for the two groups studied.

		Mean	SD	Median	Min	Max
ISQ primary	Group A	58.7	3.10	56	48	75
	Group B	60	5.64	59	52	70
ISQ Secondary	Group A	82.33	4	84	75	87
	Group B	82.78	4.82	84	75	90

1.Effect of time on the implant stability within the same group (Intra-group comparison) For Group A, the mean of implant primary stability was (58.7±8.82) ISQ, secondary stability was (82.33±4) ISQ For Group B, the mean of implant primary stability was (60±5.64) ISQ, secondary stability was (82.78±4.82) ISQ For both groups, according to the Paired T-test, there was a highly significant difference in the mean of implant primary stability between the two-time intervals 2.Comparison of the Mean of Implant Stability between the two groups at the same time interval (Inter-group comparison) From Table 5, we can conclude the following: Although Group B achieved a higher Mean of Implant Stability than Group A at all time intervals, according to the Independent T- test, the difference between the two groups was not statistically significant. Table (5): Mean ±SD of Implant Primary Stability for the two groups at different time intervals.

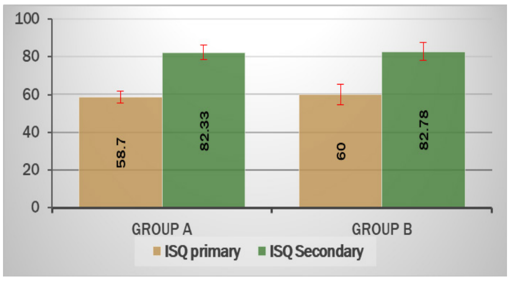
	Group A	Group B	P-value*
ISQ primary	58.7±8.82	60±5.64	0.699NS
ISQ Secondary	82.33±4	82.78±4.82	0.834NS
P-value**	< 0.001HS	< 0.001HS	

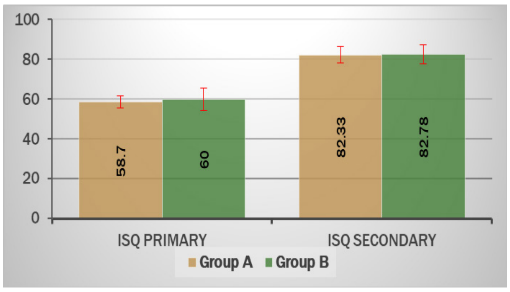
-* P-value for Inter-group comparison between the two-groups (Independent T-test).

-** P-value for Intra-group comparison between the two-time intervals (Paired T- test).

- S= Statistically significant at P ≤ 0.05

- NS= Non-significant P < 0.05.





HS= Highly significant at P ≤ 0.001 Figure(10): A bar chart representing the Mean and SD of Implant Primary Stability for the two groups at different time intervals.

DISSCUSION:

Dental implants placed immediately are commonly approved and have survival rates that are on par with implants placed in accordance with standard treatment methods[13].In our study, Effective immediate implant insertion required atraumatic extraction, which maintains the maximum percentage of bone contacting the implant[14]. It ensure strong primary stability. Because atraumatic extraction prevented the buccal and interradicular bones from breaking, it may not be appropriate to insert implants immediately. This bolsters the assertions made by Huang and colleagues in 2023. that the stability of the implant depends on maintaining bone tissue during an atraumatic bone extraction [15] . This study evaluated the Accuracy of position and Stability of immediate implant placement in the mandibular molar areas using roots of molar teeth as a guide and fabricated surgical guides.Technique of using molar roots as a guide aids in improved stabilization and direction of osteotomy drills held up by retained roots and enables accurate three-dimensional implant placement at extraction sites with multiple roots using the maximal interradicular bone septa support. 18 of the 20 implants in this study were operating well during the evaluation period, resulting in a 90% survival rate. 2 implants, one for each group failed approximately four weeks after implantation and had to be removed. This failure can be the result of the patient not finishing the prescribed course of medication and not following the post-surgery instructions for proper dental hygiene. This was in agreement with Kochar and colleagues in 2022 whom claimed that one of the primary reasons for early implant failure is inadequate mouth hygiene [16] . Regarding Implant Primary Stability for group A, the average values of Implant Stability immediately post-operative was (58.7±8.82) indicating accepted Primary Stability except for one implant that showed less Primary Stability because of presence of inadequate inter-radicular bone after implant's osteotomy preparation. In light of that the presence of adequate inter-radicular bone after implant's osteotomy site preparation is essential to give a good Primary Stability in case of immediate implant placement in molar region. After 6 months the Secondary Stability increased and assessed again with a mean value of (82.33±4). The bone found apical to the tooth might not be the only key element that influenced to stability of the implant as these findings of higher stability values using inter-radicular bone drilling technique were thought to be due to presence of adequate inter-radicular bone which preserved during extraction and drilling for the implant[17]. This supports Rebele et al. who claimed that immediate implant placement with tooth guidance boosted stability. Additionally, this is in agreement with Scarano et al in 2017[18] who claimed that all immediate implants done using this method had superior stability than those inserted using the conventional method. Concerning Implant Stability for group B, all implants showed high Primary Stability except for one implant that showed less Primary Stability. It was found that the Mean Implant Stability immediately after the surgical procedure was (60±5.64). After 6 months the Secondary Stability increased and assessed again with a mean value (82.78±4.82) and this agrees with Pozzi in 2021 [19] who inserted 60 implants using computer guided technique and found that the average initial stability spontaneously after the surgery was (71+-2.8). Throughout the study, using a superimposition of the pre-operative and post-operative CBCT x-rays, the Accuracy of inserted implants was measured by calculating the entire discrepancies between virtually planned and actually inserted implants. Findings for (Group A) have an average of horizontal plane displacement at the coronal part of the implants (1.96±0.68) mm. While, at the apical part of the implants was (1.58±0.81) mm. The average angle of discrepancy between the actual implants' longitudinal plane and the virtually planned implants was (4.98±3.1) degrees and this is additionally in conjunction with Abdelazim, 2021 [12] whom recorded that the Implant Accuracy in the coronal part of the implants had an average of (0.99+-0.51) mm and in the apical part had an average of (1.28+-0.50) mm and angular deviation with an average of (3.78+-3.22). Findings for (Group B) have an average of horizontal plane displacement at the coronal part of the implants (1.54±0.46) mm. While, at the apical part of the implants was (1.32±0.76) mm. The average angle of discrepancy between the actual implants' longitudinal plane and the virtually planned implants was (4.32±2.35) degrees , these findings indicated that implants placed in (Group B) have some superior accuracy regarding coronal, apical positions and implant angulation and this is in agreement with Ku hn 2022 [20] who did a retrospective cohort study to assess Implant Accuracy using the Computer guided technique and found that the Computer guided technique demonstrated a great accuracy in implant's coronal, apical positions and angulation. Also, It agrees with Ayman et al in 2022 [21] who assessed the precision of immediate implant placement for 22 patients using Computer-guided approach and found that computer guided technique showed a superior accuracy in implant's coronal, apical positions and angulation. These findings demonstrated non significant variance in implant position among the both groups (coronal, apical and angulation). Group B showed some superiorioty accurate position than Group A. Varga in 2020, inserted 207 implants in 101 patients using all types of Computer guided techniques and Free hand technique and compared the results to investigate the Implant Accuracy in all techniques. He found that the implants inserted by Fully guided technique showed more accuracy than implants inserted by Free hand technique in the coronal, apical positions and implant angulation [22]. Also, this in agreement with Chen in 2025 [23] who inserted 24 immediate implants, 12 of them by Surgical guide and the other 12 implants by Free hand. He noticed that the implants inserted by Surgical guide showed superior accuracy than implants inserted by Free hand in coronal, apical positions and implant angulation. Even though the interradicular bone drilling between roots of molar teeth technique show more Accuracy and Stability than Conventional Free hand technique and still comparable with Computer fabricated surgical guided technique with a low cost and less time and gives reasonable results related to Implant accuracy and Stability.

CONCLUSION:

From our study we can conclude that interradicular bone drilling technique is a good option for immediate implant placement in the lower posterior area, interradicular bone drilling technique is easier to access, visible, low-cost, less sensitive, takes less time, and provides good results for implant accuracy and stability. In contrast, using

Recomendation:

More clinical studies are needed in accordance to the interradicular bone drilling technique.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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