

Clinical and Radiographic Assessment of cyanoacrylates Opposing Buccal sliding flap for the immediate repair of Oroantral communication

Original
Article

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ABSTRACT

Introduction: Oroantral communication is an uncommon, inadvertent incident resulting from various causes the most common of which is the extraction of upper molars. Immediate closure of the communication is highly recommended to avoid infection and subsequent fistulous tract formation. Cyanoacrylate tissue glue was introduced as a reliable method for flapless sealing of the communication without any of the complications associated with the surgical maneuvers. One of the oldest surgical procedures used for closure of the Oroantral communication is the buccal advancement flap which proved efficiency in complete closure of the defect with minimal related complications.

Aim of the study: The study aims evaluate the immediate flapless closure of Oroantral communication using cyanoacrylates versus the buccal sliding advancement flap.

Patients and Methods: Twenty patients suffering from instant oroantral communication were included in the study. CBCT was performed to each of them to confirm the diagnosis, patients were divided into two groups where Group I (Study group) patients were treated by sealing of the defect using periacyryl 90 HV while Group II (control group) patients performed Buccal sliding advancement flap. Clinical follow up including pain, facial swelling, recurrence of the defect and sulcular depth up were performed at day 1, 3, 7, 15 and 1 month. CBCTs were done at 3 and 6 months postoperative to assess healing of the defect regarding size and density.

Results: Clinically Group I showed minimal pain and swelling with no change of sulcular depth. In contrast, Group II showed high pain level and increase in facial swelling together with a significant decrease in sulcular depth. None of the patients in both groups showed any recurrence of the condition. CBCTs showed decrease in defect size and formation of bone within the defect in both groups.

Conclusion: Both maneuvers are good modalities for treating OAC, however cyanoacrylate is associated with minimal complications.

Key Words: CBCT, Cyanoacrylates, Dermoid Buccal flap, Oroantral communication.

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INTRODUCTION

Oro-antral communication (OAC) is the inevitable connection between the oral cavity and the maxillary sinus. The most reputable cause of the condition is the extraction of maxillary molars due to the close proximity of their roots to the antral floor which is very thin in this area^[1, 2]. Moreover, periapical infection, large cysts, tumors and trauma can all be potential causes of oroantral communication^[3, 4]. It is of utmost importance to close this patent connection as soon as it is recognized to preclude the development of sinusitis with subsequent fistula formation^[5]. Several articles recommended the closure of this communication within 24 hours of the incident^[6].

Affirmation on the presence of OAC is established through several procedures comprised of clinical

examination including Valsalva test, Cheek blowing test and probing of the perforation site through the socket however, this specific technique is not favored anymore as it is associated with several complications as increasing size of the defect and the possible pushing of foreign bodies or bacteria into the maxillary sinus^[7, 8].

Clinical diagnosis must be followed by radiological confirmation to exclude the presence of any dental roots or foreign bodies near or within the vicinity of the antrum. Radiographs provide accurate assessment of the site and size of the defect. Radiographic maneuvers commonly used are periapical, panoramic view^[9]. Computerized Tomography (CT) as well as Cone beam computerized Tomography (CBCT). Nowadays, CBCT is widely used due its high quality, available 3D images, low radiation dose and the accurate details with less artifacts than helical

CT. Oroantral communications are presented in CBCT as sinus floor disruption giving way to a clear interconnection between the oral cavity and the sinus^[10, 11].

Several treatment options were postulated for the immediate closure of OAC, these are either conservative or surgical maneuvers. It is to be mentioned that the size and site of the defect strongly influences the treatment of choice. It is commonly agreed that a defect within 2 mm can heal spontaneously providing the stability of blood clot is secured and total absence of infection throughout the healing period^[12, 13]. On the other hand, larger defects are managed in a different way; they were for long treated using local flaps. Different types of flaps proved efficient including buccal, palatal, tongue together with nasolabial flaps. Also, combinations of different types according to the size and site of the defect were used successfully^[14, 15].

One of the oldest surgical procedures to treat Oroantral communication is the buccal sliding flap. Rehrmann was the first to introduce this flap in 1945 and since then it gained wide popularity owing to its ease of technique, reliability and versatility. However, several drawbacks were associated with this procedure including loss of sulcular depth, pain and edema^[16, 17].

Conservative means of OAC closure were strongly advocated by several articles where acrylic splints, platelet rich fibrin, fibrin glue, collagen membrane and cyanoacrylates were used as efficient substitutes for the regular surgical procedures to bypass their side effects^[18, 19].

Cyanoacrylates were first introduced to the medical field in the 1940 s, the widely used forms were polymers of N-butyl cyanoacrylate, and 2-octyl cyanoacrylate. These polymers activate in the presence of moisture forming a tight chain between the two surfaces to be bonded in a hasty process lasting only 10 - 15 seconds. These structural properties permitted boosting of the coagulation process and building a mechanical barrier at the site of tissue breakdown^[20]. Thus Cyanoacrylates are regarded as an acceptable alternative to wound suturing due to the decreased time taken for wound closure and reduced incidence of surgical site infection^[21, 22].

Unfortunately, the process of activation of cyanoacrylates is exothermic which can cause tissue damage. In order to attenuate the harmful effects of heat generation, long chains of methyl group were added to prolong the polymerization process thus decreasing the rate of heat generation^[23].

Nowadays, Cyanoacrylates are incorporated in various procedures within the medical field owing to their competence in corneal surgery, hemostasis of gastrointestinal bleeding, obliteration of urinary tract fistulae, cerebrospinal fistulae in addition to its utilization in skin graft fixation^[24-26].

In Oral and Maxillofacial surgery cyanoacrylates are used in osteosynthesis of mandibular fractures, bone grafts, alveolar and palatal clefts^[27, 28]. Also, Cyanoacrylates were proved to accelerate the healing process within lacerations and perforations, to possess an antibacterial effect, decreases incidence of infection^[29] and to promote healing and maintain hemostasis within sockets after tooth extraction. Moreover, Cyanoacrylates were related to decrease scarring in extraoral wounds^[30, 31].

Periacryl 90 is a newly formulated cyanoacrylate polymer; its formula is designed to perform, specifically in the oral cavity. PeriAcryl®90HV* is an ideal blend of n-butyl cyanoacrylate and 2-octyl cyanoacrylate that has the perfect set of properties to function on soft tissue. The N-butyl cyanoacrylate contributes to the fast-setting characteristics while the 2-octyl component makes the dressing flexible and more comfortable on the soft tissues^[32].

There is a lack of adequate evidence regarding effects of cyanoacrylate on the healing process of the sinus membrane. Therefore, the present study aims to assess clinical and radiological efficacy of cyanoacrylates in flapless closure of acute oroantral communication.

PATIENTS AND METHODS

The present study was carried out in the Oral surgery and Maxillofacial Department, Faculty of Dentistry, October 6 University. A total of 20 patients suffering from instant oroantral communication during inadvertent extraction of upper molars were incorporated in the study. Diagnosis and confirmation of the presence of OAC was based on clinical and radiological examinations.

Clinical examination was based on:

1. Clinical inspection.
2. Valsalva test: asking patients to exhale air while pressing their nostrils, air bubbles were seen getting out of the socket.

Radiological Examination: After confirmation of clinical examination immediate CBCT scans were arranged for all patients to verify the following findings:

1. Communication between the maxillary sinus and oral cavity with size range 5 - 8 mm.
2. Preserved intact buccal and palatal lamellar bone.
3. Absence of any tooth fragment or foreign body within the sinus

Patients were excluded from the study if:

1. They suffer from any chronic systemic disease or on regular medication.
2. Presence of any foreign material within the sinus.

3. Presence of periapical infection.
4. Smokers.

All Patients were acknowledged of both study procedures and all related possible complications. Upon approval on both study regimens, all patients signed a written consent to be operated on by either of the two procedures. The study was approved by the ethics committee of Faculty of Dentistry, October 6 University.

Patients who fitted the inclusion criteria were 12 males and 8 females with age range 29 - 62 years. Patients were randomly divided into two equivalent groups where Group I patients had their OAC closed using collagen sponge soaked with periacryl HV 90¹ (cyanoacrylate) (Figure 1), while Group II patients were treated using buccal advancement flap.

Group I procedure (Study Group):

Closure of the communication was performed under local anesthesia (Buccal and palatal infiltration) containing vasoconstrictor. The site of the defect was copiously irrigated with saline solution then inspected for any gingival tears or sharp bony edges which should be trimmed before commencing with the maneuver.

A collagen cone (Parasorb cone)² was cut to appropriate size, soaked totally with Periacryl then inserted gently inside the socket. After completely adapting the collagen pellet inside the socket a uniform layer of Periacryl * 90 HV was applied on top of the collagen to completely seal the socket (Figure 2).



Figure 1: Periacryl HV 90 supplied in ampules.



Figure 2: A: irrigation of the socket, B: collagen cone cut and soaked with periacryl, C: collagen cone inserted in the socket, D: socket is completely soaked with periacryl.

Group II Procedure (Control Group):

Patients of group II received local anesthesia Lidocaine 2 % with epinephrine. The socket was copiously irrigated with saline to remove any debris or any related tooth structure. A Trapezoidal mucoperiosteum buccal flap was performed by making two sharp divergent incisions through the mucoperiosteum to bone and carried superiorly to the height of the mucobuccal fold. The periosteum on the under surface of the flap was incised horizontally at the base of the flap to allow ease of flap advancement. The extraction socket was closed by sliding the buccal flap over the socket and suturing the flap to the undermined palatal mucosa. Sutures were done using silk 3 - 0 which was removed after 10 days (Figure 3).



Figure 3: A: Socket after irrigation, B: buccal advancement flap C: repositioning and suturing of the flap.

Postoperative instructions and medications were the same for both groups. All patients were warned to avoid consuming hot food or drinks, nose blowing, sneezing with closed mouth or any form of negative or positive pressure for 1 week postoperative.

All patients were prescribed Augmentin³ 1 gm/12 hrs for one week, Paracetamol⁴ 500 mg* /12 hrs for one week and were advised to use it whenever necessary. Nasal decongestants * were also prescribed 3 qed/ 7 days. Sutures were removed after 10 days in Group II patients.

¹ Resorba Medical GmbH.

² Periacyl®90HV glustitch.

³ GlaxoSmithKline, UK.

⁴ Misr company.

Postoperative Evaluation:

Clinical Follow up:

Clinical postoperative data collected were:

- Pain was assessed using a visual analogue scale (VAS) of 10 units in combination with a graphic rating scale. On the VAS, the left most end

represented the absence of pain (score 0) and the right most end indicated the most severe pain (score 10).

- Facial swelling was assessed using the modified Gabka and Matsamura^[33] technique .Using a soft tape three measurements were recorded, tragus to the outer corner of the nose, tragus to the outer corner of the mouth, and lateral corner of the eye to the angle of the mandible. The sum of the 3 preoperative measurements was taken as the baseline. The difference between the maximum postoperative measurement and the baseline gave the value of facial swelling for each patient.

- Vestibular depth: was assessed using graded periodontal probe.
- Persistence of the communication is evaluated through asking the patient about signs of OAC and by clinical examination.

Clinical data were collected at 1, 3, 7, 15 days and 1 month postoperatively.

Radiographic evaluation:

CBCTs were done for each patient preoperatively and at 1 month and 3 months postoperative to evaluate the following:

- The defect size was measured both buccolingually and mesiodistally by taking average of three readings from three different planes.
- The bone density at the site of the defect was measured using software of Planmeca (Romexis Planmeca, Planmeca, Finland).

Statistical Analysis:

Numerical data were explored for normality by checking the distribution of data and using tests of normality (Kolmogorov-Smirnov and Shapiro-Wilk tests). All data showed normal (parametric) distribution except

for pain scores which showed non-normal (non-parametric) distribution. Parametric data were presented as mean, standard deviation (SD) and 95% Confidence Interval (95 % CI) values. Non-parametric data were presented as median and range values. For parametric data. Student's t-test was used to compare between mean age values in the two groups. Repeated measures ANOVA test was used to compare between mean swelling, vestibular width, defect size and density in the two groups as well as to study the changes by time within each group. Bonferroni's post-hoc test was used for pair-wise comparisons when ANOVA test is significant. For non-parametric data, Mann-Whitney U test was used to compare between the two groups. Friedman's test was used to study the changes by time within each group. Dunn's test was used for pair-wise comparisons. Qualitative data were presented as frequencies and percentages. Fisher's Exact test was used for comparisons between the groups. The significance level was set at $P \leq 0.05$. Statistical analysis was performed with IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

RESULTS

Demographic data:

Results revealed no statistically significant difference between mean age values or gender distribution in the two groups.

Table 1: Mean, standard deviation (SD), frequencies (n), percentages and results of Student's t-test and Fisher's Exact tests for comparisons of demographic data in the two groups:

Case	Group I (n = 10)	Group II (n = 10)	P-value
Age (Years)			
Mean (SD)	46.1 (10.7)	46.4 (12.3)	0.954*
Gender [n (%)]			
Female	4 (40)	5 (50)	1.000
Male	6 (60)	5 (50)	

*: Significant at $P \leq 0.05$.

Pain Scores (VAS 0-10):

Pain scores revealed significant lower pain scores in Group I in respect to Group I at 3 as well as 7 days respectively. However, there was no demonstrated statistically significant difference between the two groups at 15 days as well as 1 month. (Table 2, Figure 4). Obviously, pain levels decreased by time within the two groups yet group I patients scored less pain levels as early as 1 and 7 days postoperative.

Table 2: Descriptive statistics and results of Mann-Whitney U test for comparison between pain scores in the two groups and Friedman's test for the changes by time within each group:

Time	Group I (n = 10)		Group II (n = 10)		P-value	Effect size (d)
	Median	Range	Median	Range		
1 day	8.5 ^A	7 – 10	9.5 ^A	9 – 10	0.027*	1.050
3 days	5 ^B	4 – 7	8.5 ^B	7 – 10	< 0.001*	2.407
7 days	1.5 ^C	0 – 3	4.5 ^C	2 – 6	< 0.001*	2.616
15 days	0 ^D	0 – 1	0 ^D	0 – 2	0.503	0.187
30 days	0 ^D	0 – 0	0 ^D	0 – 0	1.000	0.000
P-value (Changes by time)	< 0.001*		< 0.001*			
Effect size (w)	0.955		0.968			

*: Significant at $P \leq 0.05$, Different superscripts in the same column indicate statistically significant changes by time.

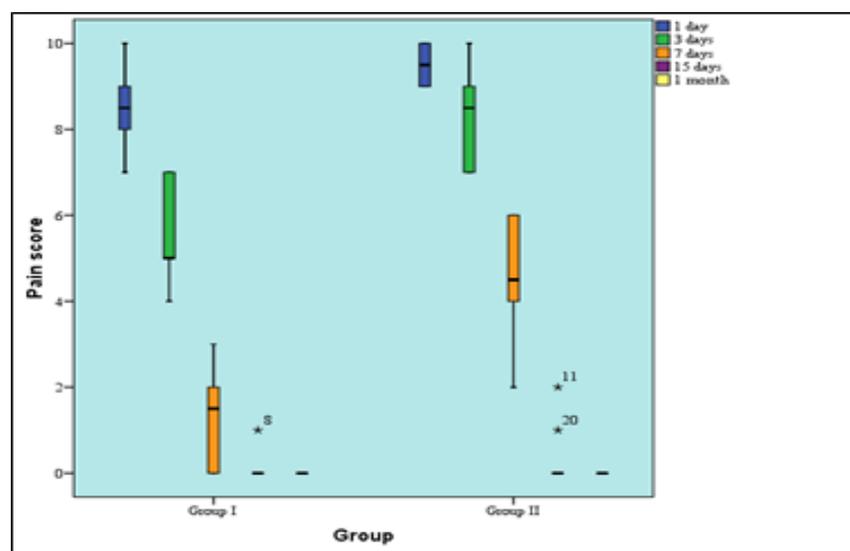


Figure 4: Box plot representing median and range values for pain scores in the two groups (Stars represent outliers).

Facial Swelling:

Results collected showed increase in facial dimensions in both groups. Yet it is to be noted that group I revealed mild increase within facial measurements at day 1 and 3 days postoperative followed by a marked decline at day 7 and 15 postoperative. In contrast

Group II demonstrated a significant increase in facial dimensions at day 1, 3, 7 and 15 consecutively. Data collected from both groups at 1 month postoperative were showed complete resolution of the swelling with facial measurements were similar to the immediate postoperative. (Table 3, Figure 5).

Table 3: Descriptive statistics and results of repeated measures ANOVA test for comparison between swelling in the two groups as well as the changes by time within each group:

Time	Group I (n = 10)	Group II (n = 10)	P-value	Effect size (Partial Eta Squared)
Pre-operative				
Mean (SD)	10.02 (0.35) ^B	10.37 (0.18) ^B	0.011*	0.308
95 % CI	9.84 – 10.2	10.19 – 10.55		
1 day				
Mean (SD)	10.98 (0.56) ^A	12.32 (0.38) ^A	< 0.001*	0.688
95 % CI	10.66 – 11.3	12 – 12.64		
3 days				
Mean (SD)	10.94 (0.54) ^A	12.4 (0.36) ^A	< 0.001*	0.737
95 % CI	10.64 – 11.25	12.1 – 12.71		
7 days				
Mean (SD)	10.09 (0.41) ^B	12.09 (0.42) ^A	< 0.001*	0.865
95 % CI	9.81 – 10.37	11.81 – 12.37		
15 days				
Mean (SD)	10.02 (0.35) ^B	10.69 (0.17) ^B	< 0.001*	0.625
95 % CI	9.84 – 10.2	10.51 – 10.87		
1 month				
Mean (SD)	10.02 (0.35) ^B	10.37 (0.18) ^B	0.011*	0.308
95 % CI	9.84 – 10.2	10.19 – 10.55		
P-value (Changes by time)	< 0.001*	< 0.001*		
Effect size (Partial Eta Squared)	0.812	0.949		

*: Significant at $P \leq 0.05$, Different superscripts in the same column indicate statistically significant changes by time.

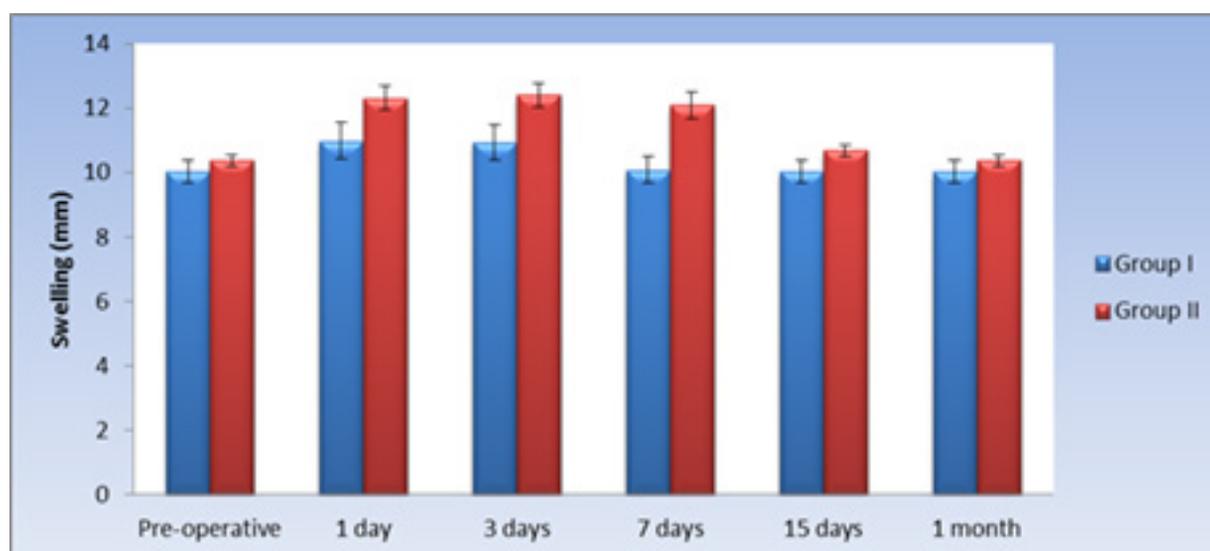


Figure 5: Bar chart representing mean and standard deviation values for swelling measurements in the two groups.

Vestibular depth:

Results gained in the present study showed that there was no preoperative significant difference between mean vestibular depths in the two groups. In contrast, at day 1, 3, 7, 15 days as well as 1 month. Group I showed

statistically significant higher mean vestibular depth than Group II which experienced a significant decrease in mean vestibular depth. This reduction started at day 1 and continues decreasing till 1month postoperative. (Table 4, Figure 6).

Table 4: Descriptive statistics and results of repeated measures ANOVA test for comparison between vestibular depth in the two groups as well as the changes by time within each group:

Time	Group I (n = 10)	Group II (n = 10)	P-value	Effect size (Partial Eta Squared)
Pre-operative				
Mean (SD)	13.91 (0.44)	14 (0.24) ^A	0.573	0.018
95 % CI	13.68 – 14.14	13.77 – 14.23		
1 day				
Mean (SD)	13.61 (0.37)	11.72 (0.63) ^B	< 0.001*	0.788
95 % CI	13.27 – 13.95	11.38 – 12.06		
3 days				
Mean (SD)	13.53 (0.35)	10.3 (0.63) ^C	< 0.001*	0.918
95 % CI	13.19 – 13.87	9.96 – 10.64		
7 days				
Mean (SD)	13.9 (0.42)	9.78 (0.44) ^C	< 0.001*	0.962
95 % CI	13.61 – 14.19	9.49 – 10.07		
15 days				
Mean (SD)	13.91 (0.44)	8.61 (0.4) ^D	< 0.001*	0.978
95 % CI	13.63 – 14.19	8.33 – 8.89		
1 month				
Mean (SD)	13.91 (0.44)	7.89 (0.39) ^E	< 0.001*	0.983
95 % CI	13.63 – 14.19	7.61 – 8.17		
P-value (Changes by time)	0.088	< 0.001*		
Effect size (Partial Eta Squared)	0.464	0.998		

*: Significant at $P \leq 0.05$, Different superscripts in the same column indicate statistically significant changes by time.

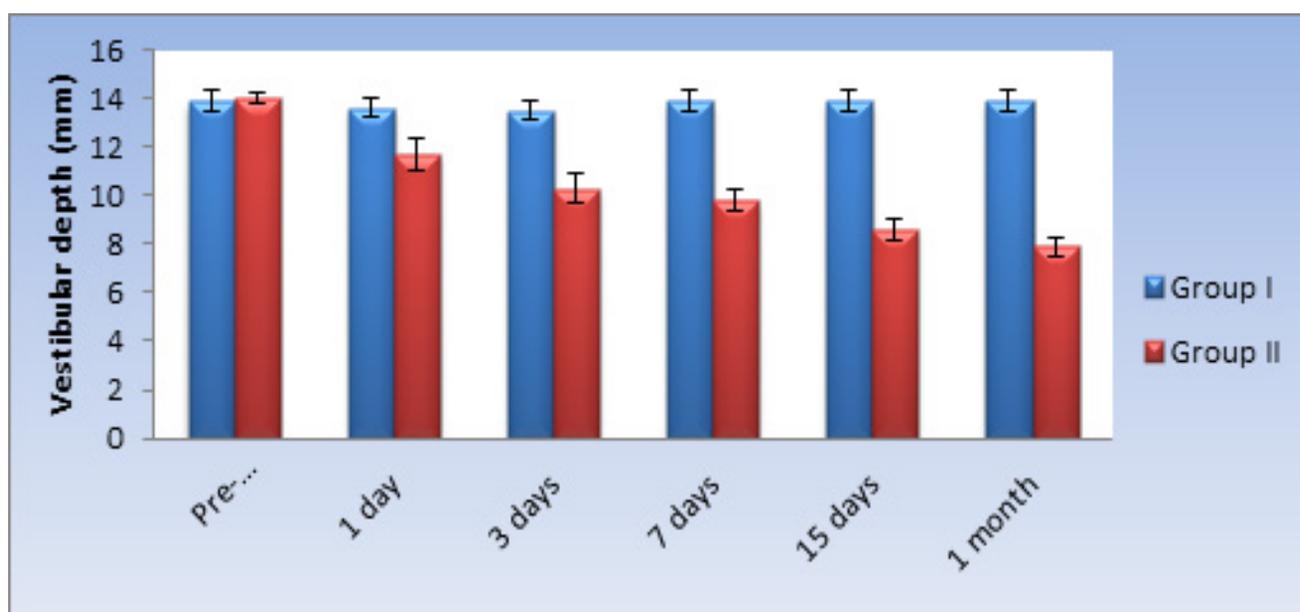


Figure 6: Bar chart representing mean and standard deviation values for vestibular depth measurements in the two groups.

Presence of Oroantral communication:

There were no clinical signs of persistence of OAC at any of the follow up period in both groups.

Defect size:

Cone beam CTs taken preoperatively confirmed the presence of communication with defect mean size range

63.56 ± 73.24 in both groups. Recorded results evidently showed similar values for both groups at different time periods, so there was no statistically significant difference between the two groups (Figure 9).

As regards the changes by time, there was a marked decrease in defect size after 3 months as well as from 3 to 6 months. (Table 5, Figure 7).

Table 5: Descriptive statistics and results of repeated measures ANOVA test for comparison between defect size in the two groups as well as the changes by time within each group:

Time	Group I (n = 10)	Group II (n = 10)	P-value	Effect size (Partial Eta Squared)
Pre-operative				
Mean (SD)	68.4 (7.29) ^A	68.4 (7.29) ^A	1.000	0.000
95 % CI	63.56 – 73.24	63.56 – 73.24		
3 months				
Mean (SD)	30.1 (3.4) ^B	30.1 (3.4) ^B	1.000	0.000
95 % CI	27.83 – 32.37	27.83 – 32.37		
6 months				
Mean (SD)	15.9 (2.96) ^C	15.9 (2.96) ^C	1.000	0.000
95 % CI	13.93 – 17.87	13.93 – 17.87		
<i>P-value (Changes by time)</i>	< 0.001*	< 0.001*		
Effect size (Partial Eta Squared)	0.980	0.980		

*: Significant at $P \leq 0.05$, Different superscripts in the same column indicate statistically significant changes by time.

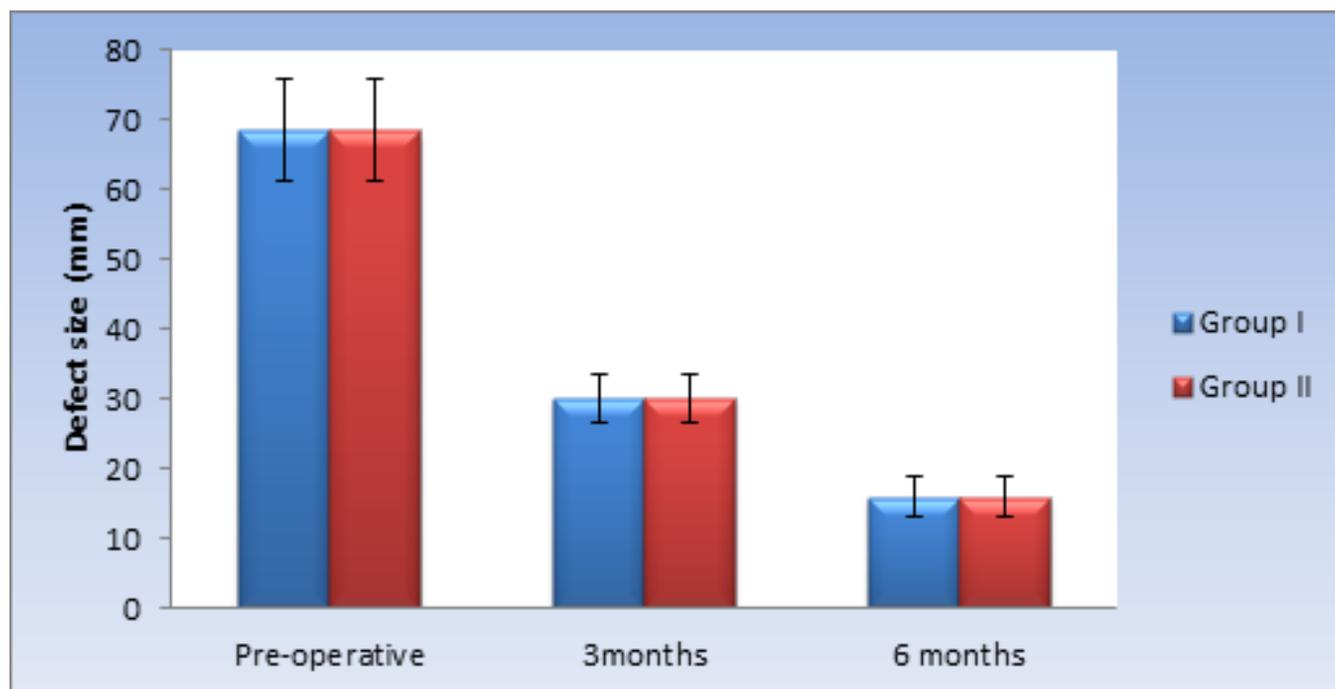


Figure 7: Bar chart representing mean and standard deviation values for defect size measurements in the two groups.

Bone density:

Both groups showed the same values at different time periods, so there was no statistically significant

difference between the two groups. As regards the changes by time, there was a statistically increase in bone density after 3 months as well as from 3 to 6 months. (Table 6, Figure 9).

Table 6: Descriptive statistics and results of repeated measures ANOVA test for comparison between bone density in the two groups as well as the changes by time within each group:

Time	Group I (n = 10)	Group II (n = 10)	P-value	Effect size (Partial Eta Squared)
Pre-operative				
Mean (SD)	241.1 (10.1) ^c	241.1 (10.1) ^c	1.000	0.000
95 % CI	234.39 – 247.81	234.39 – 247.81		
3 months				
Mean (SD)	603.2 (19.3) ^b	603.2 (19.3) ^b	1.000	0.000
95 % CI	590.4 – 616	590.4 – 616		
6 months				
Mean (SD)	638.1 (21.8) ^a	638.1 (21.8) ^a	1.000	0.000
95 % CI	623.62 – 652.58	623.62 – 652.58		
P-value (Changes by time)	< 0.001*	< 0.001*		
Effect size (Partial Eta Squared)	0.996	0.996		

*: Significant at $P \leq 0.05$, Different superscripts in the same column indicate statistically significant changes by time.

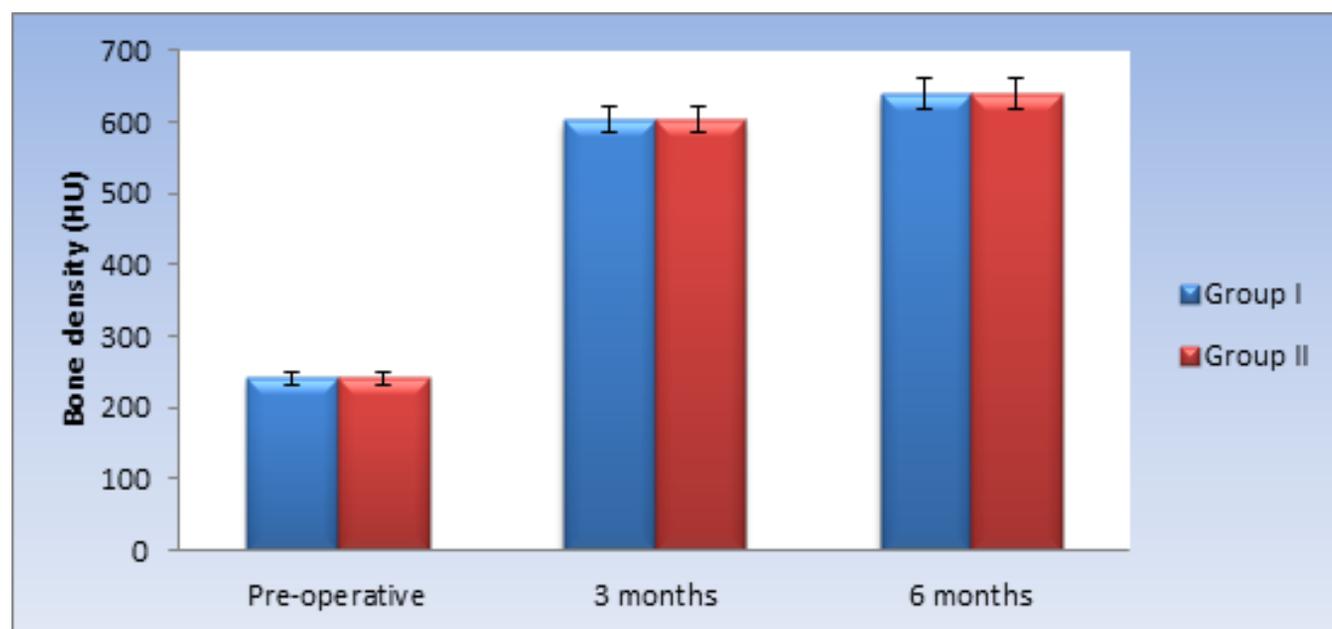


Figure 8: Bar chart representing mean and standard deviation values for bone density measurements in the two groups.

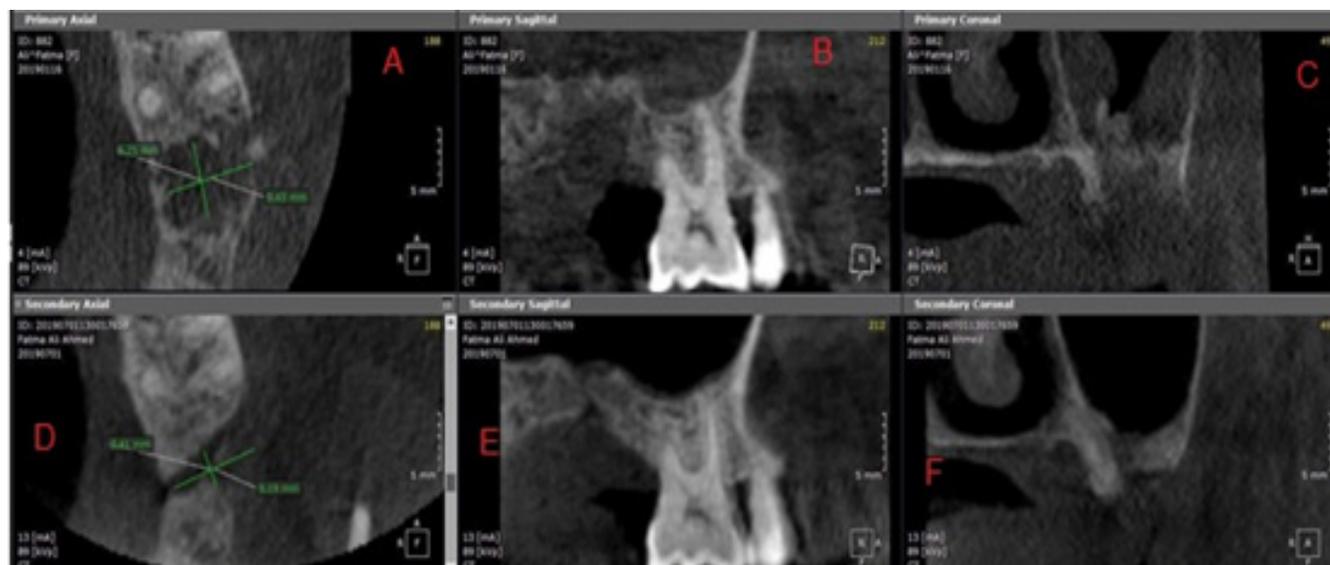


Figure 9: A, B, C showing preoperative CBCT images of the defect size and density at axial, Sagittal and coronal plane. D, E, F showing postoperative 6 months CBCT images.

DISCUSSION

Our present study aimed to qualify the efficacy of cyanoacrylate (periacryl 90) versus the buccal advancement flap for competent closure of immediate Oroantral communication. Comparisons were based on clinical symptoms and radiographical findings.

Concerning the demographic data our present results concerning gender distribution was aligning with previous

studies where the male preponderance was noted and was attributed to the type and hardness of bone. The mean age of patients with the incident was also congruent to other studies which claimed the higher incidence is at the third decade of life and provided an explanation that the maxillary sinus reaches its maximum size by this age which makes it prone to get violated during extraction^[34].

Clinical results attained in the current study are congruent with those of Buric^[20] in 2013 in a study evaluating the

efficiency of cyanoacrylates in flapless closure of Oroantral communication. Results were in favor of the acrylates as they presented minimal postsurgical morbidity and the defect was completely sealed as manifested clinically and confirmed by radiographs taken two months postoperative. It is worth mentioning that collagen pellets were used for the application of the acrylate to prevent its leakage outside the socket as the case in our study.

Likewise Choi, *et al*^[29] documented the efficacy of cyanoacrylates in the repair of the schneiderian membrane in rabbits during sinus lift and their results were verified histologically showing complete healing in the membrane with no signs of infection this in contrast to the contralateral side which was left to heal spontaneously and showed signs of delayed healing and infection.

It is worth mentioning that Cyanoacrylates proved effective in various surgical maneuvers due to its ability to potentiate healing by establishing a strong bond to skin or mucosa via swift polymerization once in contact with blood or tissue fluid^[35]. These properties allowed cyanoacrylates to provide hemostasis within the surgical field, efficiency in closure of incisions in delicate areas e.g eyelids with better esthetics, its aptness to stabilize fresh bone grafts in place till the entire healing process is completed and to decrease incidence of infection within the surgical site by forming an intact barrier against bacterial ingress^[36 - 38].

Likewise, Giray *et al*^[39] designed a clinical and microscopic study comparing mucosal wounds closed with sutures versus but cyanoacrylate adhesive in 15 patients. Results revealed significant pain and edema on the sutured side at day 1 and 2. while at days 3, 7 and 14 no significant difference was noticed between the two groups. However, at day 21, scar formation was greatly marked on the sutured site.

In contrast, to our findings several articles reported the histotoxicity of cyanoacrylates together with the associated emission of heat which can lead to severe tissue damage^[40]. This was not noticed in our present study due to the new chemical composition of the periacryl and the use of Butyl long chains which decreases the heat emission and is by far less histotoxic than previous forms.

Regarding Group II patients they performed buccal advancement flap for closure of the communication. Results collected here are similar to those of Borgonovo *et al*^[41] and Patel *et al*^[42] in two separate studies noted on the ease of the procedure and its competence with nearly no recurrence of the communication. However, as any surgical procedure the buccal advancement flap is associated with surgical comorbidity including pain and facial swelling which lasts for a considerable period of time. However, the most important drawback of the procedure is the decrease of the sulcular depth which compromises the oral hygiene and any planned prosthetic rehabilitation^[43].

It is worth noting that majority of the patients get alarmed knowing they have to perform a surgical procedure

as they totally prefer the minimal invasive procedure if it provides the same or better outcome^[44].

Cone beam CT was the method of assessment in our study following the recommendations of previous articles where they advocated the ability of CBCT to assess the size of the defect and to characterize the bone density and the mucosa surrounding the perforation. Thus CBCT can be a beneficial modality to confirm the presence of the defect and to evaluate the healing process by measuring the size and bone density within the defect^[45, 46].

Regarding the final outcome of our present study and comparing it to previous researches it is apparent that the buccal sliding flap and the flapless application of cyanoacrylate are both reliable treatment procedures for immediate Oroantral communication. However, the flapless cyanoacrylate offers an easy, reliable treatment method bypassing all comorbidities associated with surgical intervention. This is followed by the previously mentioned pain and swelling in the immediate postoperative phase while on the long run emerges the decreased sulcular depth.

CONCLUSION

Cyanoacrylates provide a simple reliable procedure for closure of immediate Oroantral communications.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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