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Original Research

Comparison between frontozygomatic angle and intraoral maxillary nerve blocks for zygomatic-arch elevation via Gillies approach:-A clinical trial

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ABSTRACT:

Anesthesia plays a paramount role in oral and maxillofacial surgery. Number of local anesthesia techniques has been introduced for surgical procedures of maxilla and mandible. Maxillary local anesthesia blocks are performed intraoral as peripheral nerve blocks or they can be given extraoraly to anesthetize the maxillary nerve at the foramen rotundum. Intraoral techniques are used routinely in day to day practices but due to their complication and number of injections for a single procedure as in case of maxilla, extra –oral technique have been introduced in literature. Extraoral nerve block techniques for maxillary nerve include suprazygomatic and infrazygomatic nerve block

Keywords: Extraoral nerve block, intraoral nerve blocks, frontozygomatic angle

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INTRODUCTION

Anesthesia plays a paramount role in oral and maxillofacial surgery. Number of local anesthesia techniques have been introduced for surgical procedures of maxilla and mandible. Maxillary local anesthesia blocks are performed intraoral as peripheral nerve blocks or they can be given extraoraly to anesthetize the maxillary nerve at the foramen rotundum. Intraoral techniques are used routinely in day to day practices but due to their complication and number of injections for a single procedure as in case of maxilla, extra -oral technique have been introduced in literature. Extraoral nerve block techniques for maxillary nerve include suprazygomatic and infrazygomatic nerve block [1]. Frontozygomatic approach is a suprazygomatic nerve block that anesthetize entire distribution of maxillary nerve for extensive surgery of maxilla, one quadrant extractions at a time, reduction of the maxillary fracture [2].

AIMS AND OBJECTIVES

AIM: to compare efficacy of F/Z approach with intraoral nerve blocks for elevation of zygomatic arch by Gillies approach **OBJECTIVES:**

- Pain while elevating z-arch.
- No of blocks given.
- Duration of anesthesia

MATERIALS AND METHODS

This study was conducted from 2018-2021 in government dental collage and hospital Srinagar and included 30 patients with Z-arch fracture. These patients were divided into two groups. Group A included 15 patients with F/Z approach and group B with 15 patients for intra oral approach. Inclusion criteria;

• Age group between 18-70 years

- Patients with isolated zygomatic arch fractures and Undisplaced ZMC fractures along with z-arch fracture.
- ASAI ASAII
- Patients not willing for General anesthesia or conscious sedation

Exclusion criteria's

- Allergic to LA
- Pre-existing visual disturbances

The study was performed after taking written consent of patients who were admitted one day before surgery. Routine case history, clinical examinations and all base line investigations were done. Patients were prepared, draped and scrubbed, mouth opening was measured by a measuring scale. These patients underwent surgical procedure for zygomatic-arch elevation via Gillies approach through intraoral and extraoral nerve block under local anesthesia with 2% lignocaine with 1;80,000 dilution of adrenaline For intraoral blocks we used 25 gauge needle and for frontozygomatic approach a 21 G long spinal anesthesia needle was used . A rubber stopper was placed at mark of 5cm in the spinal anesthesia needle

TECHNIQUES EXTRAORAL NERVE BLOCK

Patients were prepared, draped and scrubbed properly land marks were identified at the fronto-zygomatic angle region once a depression was palpated, this region was anesthetized by deposition of about 0.5-0.7ml of local anesthesia at the site of injection the needle was then proceeded forward to hit the sphenoid bone the needle was the angulated at 60° saggital and 10° horizontal plane in infratemporal fossa to hit the lateral pterygoid plane once the stopper reaches to the skin surface aspiration was done in different planes little amount of local anesthesia was deposited and patients were asked whether they felt anesthesia fluid dropping in nose or throat which means that needle was in posterior wall of pterygopalatine fossa and has penetrated the nasal mucosa. To avoid intranasal injections needle was withdrawn 4-6 millimeters direction of needle was changed and after aspiration in different planes, local anesthesia was deposited slowly near the foramen rotundum to block the maxillary nerve [3]

INTRAORAL NERVE BLOCKS

Posterior superior alveolar nerve block: Intraoral site for PSA was prepared using a sterile dry gauze, 2% lidocaine with 1:80,000 dilution of epinephrine of local anesthetic block was given with a 25 G short needle in the mucobuccal fold of maxillary vestibule over the second maxillary molar the needle was then advanced in superior, medial and posterior directions about 16 mm of needle was inserted, aspirations was done in two planes then 1.5ml of local anesthesia was deposited slowly, objective symptoms were noted after few minutes[4]

Anterior superior alveolar nerve block (infraorbital nerve block): this block was performed with help of same gauze needle (25G) in the mucobuccal fold of first premolar region, deposition of 0.8-1 ml of anesthetic solution was done and objective and subjective symptoms were noted [4]

Greater palatine nerve block: about 0.5ml of local anesthesia was injected distal to second molar to anesthetize another peripheral branch of maxillary nerve that's greater palatine nerve [4]

RESULTS

The study was performed on 30 patients divided into two groups. In Group A out of 15 patients 1 female and 14 males and in Group B 3 females and 12 males were included in this clinical trial (table 1). Mean age of patients in group A was 29 and in group B it was 33.07 (table 2).

Gender wise distribution of patients of two groups						
	Group	Male	Female	Total		
	А	14	1	15		
	В	13	2	15		
	Total	27	3	30		

Table 1: Gender wise distribution of patients of two groups

The parameters included in the study were, pain during the zygomatic- arch elevation through Gillies approach as per visual analog scale (VAS), duration of anesthesia recorded in hours, number of local anesthesia blocks given

 Table 2: Descriptive statistics of age (in years) of patients of two groups

Group	NO. of patients	Range of age	Mean	SD		
А	15	22-47	29	5.71		
В	15	24-43	33.07	6.06473		

The grouped bar-chart for both the groups are given in Figure I below:



Grouped barchart

FIGURE I

It can be appreciated from the table (table 3) that in group A -12 out of 15 patients experienced mild pain during the procedure (1-2score) 2 patients with mild-moderate pain scores (2-4 score) and one patient in whom F/Z block was repeated experienced moderate to severe pain with the score (4-6) while in case of group B 5 patients complaint of mild pain (1-2) 3 moderate pain ,5 patients with mild-moderate pain and 2 patients experienced moderate to severe pain. On comparison in group A 80% of patients experienced mild pain through the fronto-zygomatic notch approach while in group B 33.33% of patients experienced mild pain while elevating z-arch through intraoral local anesthesia blocks . General pain scores were better in group A which was statistically significant with a p-value =0.034

1 a b c - a - a - a - a - a - a - a - a - a -	Table 3: Level of r	pain of patients	of two group	s during z-arc	h elevation-VAS
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Group	Mild	Moderate	Mild-Moderate	Moderate- Severe	Total
А	12	0	2	1	15
В	5	3	5	2	15
Total	17	3	7	3	30

Using Fisher's Exact test, p-value =0.034 which is blow the significance level (0.05). Therefore, we can conclude that the variables are not independent.

The pie- charts for both the groups of different categories of pain elevations are respectively displayed in Figure II and Figure III respectively.



Figure II



Figure III

Duration of anesthesia (table 4) was evaluated in hours in both groups with the mean value of 2.47hr in group A and 2.10hr in group B, a significant difference was found between two groups with the P=0.02808

Table 4: Duration (in hours) of Anesthesia in patients

Groups	Subject	Range	Mean	SD	t-value	p-value
А	15	1.75-3.17	2.47	0.45	2.3163	0.02808
В	15	1.5-3.0	2.10	0.42		

Unpaired t-test

Note here t-value and p-value is of both groups

P-value is highly significant as it is below level of significance (0.05)

On comparison with extraoral nerve block more than three injections were given in case of intraoral nerve blocks that was less convenient to the patients than fronto-zygomatic block.

So the overall procedure through supra-zygomatic nerve block was less painful and more acceptable to the patient than the intraoral techniques.

DISCUSSION

There are number of techniques to anesthetize the maxillary branch of trigeminal nerve and every

technique has its merits and demerits however in terms of patient's compliance we have approached both intraorally as well as extraoraly to determine which method would be preferred by patients. In case of intraoral techniques we have given blocks like posterior superior alveolar nerve block, anterior superior alveolar nerve, and greater palatine nerve block on the same side of the surgery to be performed to anesthetize the terminal branches of maxillary nerve and also local infiltration was given at the site of z-arch elevation. We compared the efficacy of these blocks with the frontozygomatic angle approach of blocking maxillary nerve at foramen rotundum, though this block seems technically difficult but due to its benefits it can become versatile approach for maxillary surgical procedures.

Pain scores were acceptable in patients with frontozygomatic notch approach, out of 15 patients 12 experienced mild pain [5] thus favors efficacy of frontozygomatic angle approach, however pain score was higher in only one patients where the block was repeated it could be due to anatomical skull variations of different individuals that contributes to the difficulties in reaching to the target site [6]

Duration of anesthesia was higher in group A with the mean of 2.47hr same was observed by Radder et al. [7].

Transient diplopia on the side of surgical procedure was noted in one patients and he recovered after the wear off of the anesthesia [7] as it was also noted by Radder et al. in their study of efficacy and feasibility of frontozygomatic angle approach for extraoral maxillary nerve block.

In our study hematoma formation was seen more in PSA nerve block, 3 out of 15 patients experienced buccal hematoma due to the injury to the to the pterygoid plexus comparison with F/Z block where only one patient underwent hematoma formation [8] that might be due to the ventrally and inferiorly placed maxillary nerve in pterygopalatine fossa.

CONCLUSION

Frontozygomatic angle block for maxillary nerve can become a versatile approach for the maxillary surgical procedures without the need of sedation technique and should be used frequently as we use intraoral oral maxillary blocks on routine basis. Going through literature there is sparse data available regarding the comparison between intraoral and extraoral maxillary nerve blocks this was an attempt to elaborate this techniques for surgical procedures of maxilla. Since sample size was less it needs further elaboration.

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