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# Versatility Of Superficial Cervical Plexus Block (Scpb) Along With Inferior Alveolar Block In Comparison To The Conventional Inferior Alveolar Nerve Block (Ianb) Technique In The Maxillofacial Surgical Procedures – A Clinical Study

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**ABSTRACT**

Oral surgical and dental procedures are routinely performed in an outpatient setting. In many instances like fracture mandible reduction, extra oral drainage of facial spaces etc, the lone inferior alveolar block does not ensure a complete painfree environment. Here lies the need of some other techniques and one such method is the addition of superficial cervical plexus block.

**Methodology:** This experimental study was conducted in the Department of Oral and Maxillofacial Surgery, Government Medical College, Kottayam in a time framework of 1 year in 30 patients of ASA grade 1 or 2 with mandibular angle and body fractures who were randomized into 2 groups, Group 1 received superficial cervical plexus block along with the inferior alveolar nerve block and Group 2 received conventional inferior alveolar nerve block alone. They were compared for the pain score during the procedure using the Universal Pain Assessment Tool and the time to first analgesia post operatively. Variables involved are quantitative and analysed by using unpaired T test.

**Results:** Pain scores for the operation were low and satisfactory in group 1 compared to group 2.Also Group 2 needed postoperative analgesia somewhat earlier than group 1.

**Conclusion:** Addition of superior cervical plexus block provides superior benefits over IANB alone, because of the shorter duration of recovery and the shorter duration of the procedures.

**Keywords:** Superficial Cervical Plexus Block, Inferior Alveolar Block, Pain Score, Postop Analgesia Requirement

## INTRODUCTION

The epitaph on the tombstone of the dentist William Thomas Green Morton reads:

*"Inventor and Revealer of Inhalation Anesthesia: Before Whom, in All Time, Surgery was Agony; By Whom Pain in Surgery was Averted and Annulled; Since Whom, Science has Control of Pain."*[1]

As the adage above says, the surgical procedure before the invention of the anesthesia was really a horror experience. The performance of surgeries were nightmare experiences for the operating surgeons and dental procedures were not an exception. The classic picture of St Apolonia, the patron saint of dentistry, where she is potrayed as a victim of pulling the teeth with crude instruments in midst of severe pain depicts the dark age before the pain free golden era, heralded by the advancements of the discipline of anesthesia. The invention of general anesthetic agents made the surgical procedures pain free and hassle free but the advent of regional blocks made a great

leap in the patient management avoiding the adversities of general anesthesia.

Oral surgical and dental procedures are routinely performed in an outpatient setting. Regional anesthesia is the most common method to anesthetize the patient prior to office based procedures. Wide array of techniques are available to achieve regional anesthesia.[2] The conventional nerve blocks to get anesthesia of the mandible by the inferior alveolar nerve block is sufficient for many oral surgical procedures but in many instances like fracture mandible reduction, extra oral drainage of facial spaces etc., the lone inferior alveolar block does not ensure a complete pain free environment. Here lies the need of some other techniques and one such method is the block of superficial cervical plexus block.

The superficial cervical plexus block (SCPB) is simple and easy to perform. Cervical plexus block (CPB) was first performed by Halstead in 1884 at Bellevue, and later, Kappis in Germany described the posterior route. Although Heidenhein introduced the lateral approach, it was Labat who popularized this technique in America. The SCP block has been well described for anesthesia of the neck, submandibular area and retro mandibular regions.[3]

It finds its application in oral and maxillofacial surgery (OMFS) in incision and drainage procedures and open reduction and internal fixation of mandibular fractures. In this study we propose, the use of SCP block for management of angle of mandible fracture annexed to inferior alveolar nerve block provides greater pain control and ease of performing the procedure.[4]

## METHODOLOGY

This experimental study was conducted in the Department of Oral and Maxillofacial Surgery, Government Medical College, Kottayam in a time framework of 1 year (January 2017-december 2017).

### Sample size

30 patients were included in this study. These patients were divided into two groups using simple randomization. Every odd numbered patient was in Group 1 and they received superficial cervical plexus block along with the inferior alveolar nerve block. Every even numbered patient was in Group 2 and they received conventional inferior alveolar nerve block alone.

### Inclusion Criteria

- Patients with mandibular angle and body fractures.
- Patients belonging to ASA type 1 or 2.
- Patient's non allergic to local anaesthetic solution.

### Exclusion Criteria

- Patients with medical comorbodities belonging to ASA type 3 or more.
- Patients allergic to local anesthetics.
- Excessively anxious and apprehensive patients
- Patients with significant upper airway compromise warranting an endotracheal intubation to secure airway.
- Patients with Lefort Fractures.
- Patients with cervical fractures.

### LANDMARK FOR SCP BLOCK:

Mastoid process

Chassaignac's tubercle of C6 vertebrae-parallel to cricothyroid cartilage

### SITE OF NEEDLE INSERTION FOR SCP BLOCK:

Midpoint of the line connecting the mastoid process with the chassaignac's tubercle of C6 transverse process. (Figure 1)

Technique

All the patients involved in the study were given all relevant information regarding study and informed consent was obtained before the procedure. A detailed clinical history was recorded.

Armamentarium

- 2% Lidocaine with 1:100000 Adrenaline,
- LA Cartridges
- 20ml Syringe
- 25 Gauge Needle,
- Sterile Marker
- Surface Antiseptic/Alcohol Swipes.

After aseptic preparation of skin and standard draping procedures, patient will be positioned in supine or semi recumbent position. The conventional



Volume 2, Issue 5; September-October 2019; Page No.195-200

superficial cervical nerve block was followed. Sternocleidomastoid muscle, posterior border of the clavicular head, mastoid process and transverse process of C6 vertebra were marked on the patient using sterile surgical marker. The 25 gauge needle is inserted at the midpoint of the line connecting the mastoid process with the Chassaignac's tubercle of C6 transverse process along the posterior border of sternocleidomastoid muscle. The needle was then directed in cephalad and caudally towards along the posterior border of the sternocleidomastoid in a subcutaneous plane and 10 ml of 2% lignocaine was injected as the needle was withdrawn. Care was taken to avoid entering the external jugular vein. Wait for 10-15minutes.For intraoral local anaesthetic technique, depending on the anatomical location of the surgical site the patients were anesthetised with long buccal nerve block and inferior alveolar nerve block accordingly.

The following data were obtained from both the groups:

- The amount of lignocaine used for the block was noted in milligrams (mg);
- The dose of supplemental lignocaine administered by the surgeon during the intraoperative time measured in mg
- The pain score during the procedure was assessed using the Universal Pain Assessment Tool.
- The time to first analgesia post operatively was also noted in minutes (mins)

## STATISTICAL ANALYSIS

Data were entered in Microsoft Excel and analysis was done using SPSS version 22.

Variables involved are quantitative and analyzed by using unpaired T test.

## RESULTS

All patients successfully underwent ORIF of fracture angle of the mandible under LA. All patients expressed satisfaction with the anesthesia and said that they would be willing to repeat the experience under regional anesthesia. During the study, there were no patient refusals. Group 1 received 300mg of lignocaine while group 2 received only 200mg of lignocaine prior to surgery. All patients required additional doses of lignocaine during the surgical intervention, but the amount of lignocaine required in group 1 was less than what was required in group 2 (median 30 vs 60). However the total lignocaine administered in group 1 was greater than in group 2 (median 331 vs 272mg). Pain scores for the operation were low and satisfactory in group 1 compared to group 2 (table1). The postoperative analgesic requirements were different between the groups. Group 2 needed analgesia somewhat earlier (median time to first request being 60 vs 15 min) than group 1(table 2).There were no postoperative complications that could be attributed directly to placement of the regional block. All patients were discharged home 48-72 h after their operation. (Table 1,2)

## DISCUSSION

Adequate anesthesia has been a critical component for pain management in maxillofacial surgery. Eventhough general anesthesia is the useful and simple way to achieve surgical anesthesia, it has its own down sides including high economic cost, requirement of highly trained personnels, morbidity and mortality. Regional anesthesia or local anesthesia is preferred whenever general anesthesia is not mandatory or when the ischemic condition of the patient poses a high risk. The advantages of regional anesthesia that overrules general anesthesia includes stress free anesthesia due to high catecholamine release, low rate of blood loss because of local vasoconstrictors and sympathetic blockade, low rate of postoperative pulmonary embolism and thrombosis, easily performable techniques, faster recovery, lower costs and lower morbidity rates in appropriate dosages of local anesthetics[5].The superficial cervical plexus block is one of the frequently used regional anesthetic technique in various surgeries such as thyroidectomy, carotid endarterectomy, vocal cord surgeries and cervicogenic painful syndromes.[3,6,7] Anatomic studies of the spread of injective with superficial cervical plexus block in humans suggest that the local anesthetic crosses the deep cervical fascia and blocks the cranial nerves at their roots, that is SCP innervates the skin of anterolateral neck.[8] Its application in oral and maxillofacial surgery has been in surgical drainage in submandibular and submental abscess, mandibular fractures, excisions of superficial lesions, and skin suturing in the corresponding dermatome.



Volume 2, Issue 5; September-October 2019; Page No.195-200

The superficial cervical plexus[9] (SCP) originates from the anterior rami of the C1-C4 spinal nerves and gives rise to 4 terminal branches—greater auricular, lesser occipital, transverse cervical, and suprascapular nerves. The transverse cervical nerve (C2 and C3) travels laterally toward midline to supply the anterolateral aspect of the neck from the sternum to the mandible.

Pandit et al conducted an anatomical study of the spread of injectate with SCP block in cadavers and concluded that the superficial cervical space communicates with the deep cervical space and blocks the cervical nerves at their roots suggesting that the superficial cervical plexus innervates the skin of the anterolateral neck.

Perisanidis et al[10] study concluded that combined superficial cervical nerve block and inferior alveolar nerve is feasible, effective and safe in patients undergoing surgical interventions in the oral and maxillofacial field. They observed that this nerve block was highly effective in providing regional anesthesia in the cervical region and controlling pain intraoperatively and within the first 24 h after anesthesia in all studied patients, with no block-related complications occurring.

In our study, the median time taken to provide first post-operative analgesia was after one hour in superficial cervical block patients whereas it was 15mins in IANB alone patients. Similar to the above study we did not come across any block related complications.

GA is commonly preferred in reduction of fractures of angle of mandible to local anesthesia. Under local anesthesia the same procedure is cumbersome; both for the patient and the surgeon. The effective use of regional anesthesia with combined technique can provide both patient comfort and safety to perform surgery in deeper planes of the neck and per mandibular region.

SCP block provides regional anesthesia to perform skin incision and the necessary tissue dissection required with ease. By combining SCP block with conventional inferior alveolar nerve block, positive outcome was achieved with this study such as patient compliance for the procedure was increased, the duration of the surgical procedure was decreased and patient satisfaction was increased.

Also in our study, the additional lignocaine given during the procedure was in group 1 lesser when compared with group 2. This might also be because a higher dose of lignocaine was administered prior to surgery in group 1 patients when compared with group 2.

In our study the VAS assessment was done to quantify the pain during the procedure. 40% of the patients (table1) had only moderate pain when IANB was combined with SCP. 47% of patient who been given conventional nerve block had severe pain and 20% of them had very severe pain.

The complications of this superficial cervical nerve block include infection, phrenic nerve blockade, LA toxicity, hematoma, nerve injury, and spinal anesthesia.[4] however no adverse drug or technique incidents were recorded either of our group patients.

## CONCLUSION

From our study we find that office-based ambulatory loco-regional anesthesia can be practiced for oral and maxillofacial surgery under strict written guidelines. Also the costs of patient care can be lowered, because of the shorter duration of recovery and the shorter duration of the procedures. Thus we conclude that this belt and braces technique provides superior benefits over IANB alone.

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Volume 2, Issue 5; September-October 2019; Page No.195-200

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***Table1: Pain score***

| **Scoring of pain during the surgery** | **Number of patients (%)** | |
|---|---|---|
| | **SCP** | **IANB** |
| No pain(0) | 0 | 0 |
| Mild pain(1-2) | 26.6 | 6.6 |
| Moderate(3-4) | 40 | 26.6 |
| Severe(5-6) | 33.3 | 46.6 |
| Very severe(7-9) | 0 | 20 |
| Worst(10) | 0 | 0 |

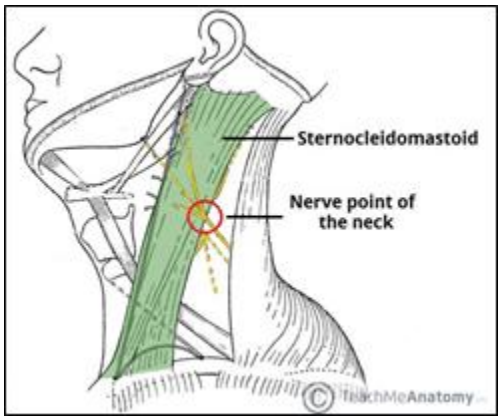


Volume 2, Issue 5; September-October 2019; Page No.195-200

**Table 2:** ***Post op analgesia requirement time***

| **No. of patients requiring analgesia in** | **SCP N=15** | **IANB N=15** |
|---|---|---|
| Less than 60 min | 3 | 9 |
| 60-89 min | 7 | 5 |
| 90-119min | 3 | 1 |
| Greater than 120 mins | 2 | 0 |

**FIGURE 1:**






Volume 2, Issue 5; September-October 2019; Page No.195-200