**AMSA (ANTERIOR MIDDLE SUPERIOR ALVEOLAR): ALTERNATE TO MULTIPLE INFILTRATIONS IN MAXILLARY ANAESTHESIA**

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**Abstract**

This article describes an alternate technique of anaesthesia of single injection for the maxillary arch, pulpal anaesthesia from the central incisor to the second premolar without requiring collateral anesthesia of the face and muscles of facial expression. The importance of this review was to bring about awareness among the general clinician who have to use multiple injection for any treatment to be performed in the maxillary arch. The non compliance of the treatment on the maxillary arch is usually due to these factors. Hence introducing this technique can help patient compliance as well ease for the clinician. Also the duration of treatment is reduced. In our study we have introduced a modification of administration of injection using a disposable syringe and needle instead of computer controlled local anaesthetic delivery system (CCLAD); which makes this technique a very useful technique for various multiple extractions, anterior maxillary cysts and other procedures like flap surgeries for dentists as well as oral surgeons.

**Keywords:** Pulpal Anaesthesia, Disposable Syringe and Needle, Single Injection
**Introduction**

Maxillary mucogingival or flap surgery usually requires up to five injections to obtain anesthesia of the hard and soft tissues. Posterior superior alveolar, middle superior alveolar, and anterior superior alveolar block injections are used to anesthetize buccal tissues whereas greater palatine and nasopalatine blocks are used for palatal anesthesia. Although this series of injections effectively anesthetizes maxillary tissues, it may also inadvertently affect facial structures such as the upper lip, lateral aspect of the nose, and lower eyelid [1,2]. The palatal soft tissue anesthesia is achieved without numbness to the lips and face or interference with the muscles of facial expression. A bilateral AMSA injection supposedly anesthetizes 10 maxillary teeth extending from the second premolar on one side to the second premolar on the opposite side [3]. The AMSA injection derives its name from the injection’s ability to supposedly anesthetize both the anterior and middle superior alveolar nerves [4]. The middle superior alveolar (MSA) and anterior superior alveolar (ASA) nerves branch from the infraorbital nerve before they exit from the infraorbital foramen. This technique anterior middle superior alveolar block was first reported by FREIDMAN & HOCHMAN in 1997[5] with the development of CCLAD system; it provides pulpal anesthesia to multiple teeth from a single injection site.

**Method**

**Inclusion Criteria**
In our study we used AMSA on patients requiring multiple maxillary extractions and/or anterior maxillary cysts, unilateral or bilateral as per the requirements.

**Anatomy** (Figure1 and 2)

a) The middle superior alveolar (MSA) and anterior superior alveolar (ASA) nerves branch from the infraorbital nerve before they exit from the infraorbital foramen. The middle superior alveolar nerve is thought to innervate the maxillary premolars and plays some role in pulpal innervation of the mesiobuccal root of the first molar. The anterior superior alveolar nerve provides pulpal innervation to the central and lateral incisors and canines [5]. The plexus where both nerves join is the target site for the AMSA injection [6].

![Figure 1](image1.png)

![Figure 2](image2.png)
the conc of 1:100000 dilution of vasodepressor was used as the local anaesthetic agent.

Figure 3

Technique
a) Malamed [1, 4] described the injection site to be on the hard palate about halfway along an imaginary line connecting the mid-palatal suture to the free gingival margin. Another description of the injection site is that it is located on the hard palate at the intersection of a vertical line bisecting the premolars and a horizontal line halfway between the mid-palatine raphe and the crest of the free gingival margin [20].(fig 5)

b) To avoid patient discomfort due to the tightly bound nature of the palatal tissue, the anesthetic agent should be injected into the site at a methodic rate of 0.5 ml per minute [3]. Slow deposition of the anesthetic agent, the bound nature of the palatal tissue promotes diffusion of the anesthetic agent through the palatal bone via numerous nutrient canals [3]. A successful AMSA injection typically blanches the palatal tissue in a unilateral fashion that does not cross the midline [21]. Anesthesia of structures typically innervated by the greater palatine nerve, nasopalatine nerve, anterior superior alveolar nerve and middle superior alveolar nerve is achieved [22, 23].

c) Within 2 minutes of this block, pulp anesthesia anesthetizing from central incisor to 2nd premolar along with the pulpal anesthesia, palatal tissues from the midpalatal region to the free gingiva of the same region are also considerably anaesthetized.

d) The duration of anaesthesia is about 60 minutes to 90 minutes. The needle during injection is oriented at a bevel of 45 degree with constant and controlled pressure.

e) The classical blanching of the palatal tissues is seen in AMSA block clinically indicating proper point of insertion and anaesthesia of the associated tissues along

Figure 5: point of insertion of the needle.
with the other clinical subjective signs. (Figure 6)

Results

1. Most of the patients reacted well to the technique. Adequate anaesthesia for an accepted duration is achieved and it reduces the cumulative reduction of the number of injections reducing patient discomfort.

Discussion

Advantages

1. The ability of the AMSA injection to cover large maxillary surgical fields provides multiple benefits because it reduces the cumulative number of necessary injections.

2. In certain patients short lived central incisor anaesthesia was observed

3. In some other patients an additional buccal vestibular infiltration was required.

2. The elimination of repetitive transmucosal punctures, the elimination of multiple injections reduces the total amount of delivered vasoconstrictor and may prove useful for cardiovascular-compromised patients requiring maxillary anesthesia.

3. For maxillary anterior esthetic procedures, the AMSA’s maintenance of upper lip function allows for continuous evaluation of gingival contours unimpeded by the “lip drooping” that
46

typically occurs with traditional anesthetic
techniques.
4. Maxillary mucogingival procedures, the
AMSA's palatal delivery of a full carpule of
anesthetic with vasoconstrictor provides
outstanding hemostasis and reduces the
need for multiple re-injections to attain
hemostatic control during graft harvest if
indicated.
5. As we used a modified technique to the
original one using CCLAD system, cost
factor was decreased making it an
affordable technique.

Disadvantages

1) The long administration time: Some
patients may find it disconcerting to have an
injection last 4 minutes, and attempts to
speed up the AMSA injection may lead to
increased patient discomfort at the injection
site.
2) The reduction of cumulative anesthetic
vasoconstrictor may also prove to be
problematic for certain surgical procedures.
3) The reduction in vasoconstrictor proves
beneficial for cardiovascular-compromised
patients, it may lead to less than desirable
hemostatic control.
4) The AMSA eliminates the need for multiple
injections, less vasoconstrictor enters the
buccal tissues and a subsequent decline in
hemostasis may obscure portions of the
surgical field.
5) Several cases of short-lived anesthesia in
the maxillary central incisor is observed.

Conclusion

This technique has the advantage to
anaesthetize multiple teeth with a single
injection covering large surgical area in the
maxillary region; thus can be used in day-to-
day practice by oral surgeons and general
dentists.

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