

**A comparative study of the anterior and middle superior alveolar
nerves injection using a computer-controlled local anesthetic
delivery system vs. the traditional injections in children**

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Abstract

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Introduction: Pain control is an important part of dentistry and particularly of pediatric dentistry and is required for many dental procedures. Recently, a palatal approach to the anterior and middle superior alveolar nerves (AMSA) has been defined where the anesthetic solution diffuses through the porous bone of the maxilla, and produces anesthesia from the second premolar to the central incisor. This technique was facilitated by the introduction of a computer-controlled local anesthetic delivery system (CCLAD) known also as the “Wand” that permits controlled slow delivery of the solution. However, there were few studies in the literature conducted on children.

The aim of this study was to evaluate the anesthetic effectiveness of the Anterior Middle Superior Alveolar (AMSA) injection administered through a computer-controlled local anesthetic delivery system (CCLAD), and compare it with the traditional buccal and palatal injections used to anaesthetize maxillary primary molars. Furthermore, an assessment of children’s pain reactions and perceptions was carried out, comparing the AMSA injection using the CCLAD to the traditional buccal and palatal injections.

Materials and Methods: The study sample was chosen according to certain criteria from children attending the dental clinics in King Abdulaziz University Hospital (KAUH). The study was divided into 2 parts. Part one included 80 primary maxillary molars, this group was divided into eight subgroups, each comprised ten teeth. The effectiveness of the technique was measured and compared in 1st molars and 2nd molars and for pulpotomy or extraction treatments through the sounds, eyes and motor scale (SEM), where the evaluator was blinded

from the anesthetic technique. In part two, the pain reactions and perceptions of the children to either technique was measured in a group of 40 children who received both anesthetic techniques on two visits. The child served as his own control. The pain reactions evaluation was carried out by the same SEM scale and the pain perception through the Eland color scale. Statistical analysis was carried out using SPSS version 10.0.

Results: The AMSA injection with the CCLAD was found to be effective in anesthetizing maxillary primary molars in pulpotomy and extraction procedures. There was no significant difference between the two anesthetic techniques except in the step of gingival retraction buccally in which the traditional injections were more effective than the CCLAD during extractions. No significant difference was found between both primary molars, gender and age groups in the anesthetic effectiveness of both techniques. In the second part, the AMSA injection delivered with the CCLAD was found to have significantly lower pain reaction and pain perception scores compared to traditional buccal and palatal injections.

Conclusions: The AMSA injection using CCLAD was found to be effective in children, additionally it was found to be less painful than the traditional injections; however, further research in this field is necessary.