Intraligamentary anesthesia in pediatric dentistry – An overview

Especially in the treatment of children the intraligamentary anesthesia as primary method of local pain elimination has proven to be beneficial. The anesthetising effect after intraligamental injection virtually begins without latency and is not associated with an extensive numbness, which children often find hard to tolerate\(^1\). Combined with a short and confined duration of action of about 30 minutes the lack of soft tissue anesthesia minimizes the risk of postoperative bite injuries\(^1,2\). A further aspect is that due to their lower weight children are more prone to overdosage with local anesthetics and the intraligamentary anesthesia only requires a small amount of local anesthetic agent.

The intraligamentary anesthesia as a particular “patientfriendly” alternative to conventional local anesthesia methods has a high acceptance in children. Even uncooperative overanxious young patients allow the treatment with this anesthesia method\(^1,2\). When applying the intraligamentary anesthesia a slow controlled injection technique is extremely important to effectively avoid unwanted side effects like e.g. elongated teeth\(^3\). Besides, it is emphasized to leave the needle tip in place for a few seconds after finishing the injection procedure to avoid a backflow of bitter tasting anesthetic solution from the sulcus into the mouth\(^2\).

The subsequent information shall give an overview about the literature concerning the application of intraligamentary anesthesia in children.

Giving a hand to oral health.
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Compliance in children

The acceptance of the intraligamentary anesthesia by children is high (1, 2, 4). The minimal insertion pain (2, 5) as well as the compared to common syringes barely menacing appearance of special syringe systems, such as the fountain pen-like design of the Citoject syringe, achieve a clear reduction of fear of injections in patients (5). Even previously uncooperative children which allowed first-time treatment with the intraligamentary anesthesia did not refuse the treatment in following appointments (2).

In an observation of Davidson & Craig comprising 100 children aged between 7 and 16 years in 97% of the cases restorative procedures on lower permanent molars could be performed under intraligamentary anesthesia. Only in 3% of the cases the treatment could not be performed due to an insufficient anesthesia success (2). 86.2% of 29 children which previously received an inferior alveolar nerve block and were ready to decide preferred the intraligamentary anesthesia (1). Even uncooperative children with syringe phobias tolerate the intraligamental injection and yet allow the extraction of milk teeth and their residual roots with that method for pain elimination (2).

The intraligamentary anesthesia in primary dentition

However, concern exists about possible damage of the underlying permanent tooth germs through the application of intraligamentary anesthesia in the primary dentition. Brannstrom et al. who applied intraligamentary injection with high pressure in baboon milk teeth found a connection between intraligamentary anesthesia and developmental disturbances in corresponding permanent teeth (6).

By contrast, a later study in dog’s milk teeth revealed that intraligamental injected ink does not penetrate the enamel organ or come into contact with the permanent tooth bud. The authors concluded that the risk for mechanical damage of the tooth bud is minimal (7).

In a recent clinical study Ashkenazi et al. came to the conclusion that intraligamentary injection delivered by computer controlled local anesthetic delivery in primary dentition of children 4 years and older does not damage the underlying permanent tooth bud (8).

Conclusion

The intraligamentary anesthesia also is an alternative to conventional methods for local pain elimination in children and youths. Not only the clearly minimized risk of postoperative bite injuries but also the high acceptance by the young patients renders the technique attractive for the application in pediatric dentistry.

Literature