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Short Communication

Hall Technique – A Paradigm Shift in Pediatric Smart Restorative Dentistry

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Abstract: Pediatric dentistry being a fascinated specialty of dentistry is excited with newer concepts and technological advancements in all domains including preventive, diagnostic and therapeutic procedures while treating children. It is very difficult to treat carious primary molars in little children who are more anxious and apprehensive using conventional drilling methods. Moreover, obtaining a positive behavior from a child during restorative procedure also makes doctor to lose patience. As a result, to overcome drawbacks associated with conventional restorative treatment procedures, numerous alternative advancements are introduced in the arena of pediatric dentistry. The 'Hall technique' is one among those novel treatment strategies introduced to restore carious primary molars. Therefore, the present research paper enlightens readers about rationale behind the use of hall technique as a promising approach to traditional drilling procedure.

Keywords: Carious primary molars, Hall technique, Minimal invasive Dentistry, Non-aerosol generating procedure, Preformed stainless steel crowns.

Introduction

Occurrence of dental caries including early childhood caries is more common in children due to various factors representing a major public dental health problem. The carious primary teeth cause various ailments making child to suffer emotionally, physically and financially. In addition, managing carious primary molars in young children using conventional drilling methods is associated with pain, use of anesthesia and many other factors [1,2]. To overcome the drawbacks of traditional restorative methods, the evolving science and technology in pediatric dentistry introduced a novel concept termed 'Hall technique' for restoring carious primary molars. General dental practitioners and pediatric dentists are the first health care professionals who deal with children suffering with dental caries and pain. In the current scenario whenever child suffers pain due to dental caries, the parents or guardians usually consult the nearby dental clinic or hospital [3]. As children exhibit more anxiety, unco-operative behavior the general dentist usually deny the treatment thinking managing a child is time consuming task and put them under medications and prolong the treatment till exfoliation of the primary teeth. This scenario is not only prevailing in India but also across the world. In growing pace of science and technology, when everything is changed why not the treatment of children [4]. Therefore, it is highly essential to enhance the knowledge and awareness about modifications followed in children for managing carious primary molars among all health care professionals. One among such modifications is the hall technique recently introduced in the arena of pediatric dentistry which established a promising restorative option compared to other conventional treatment modalities for managing carious primary molars in all health care settings. It can definitely be considered an effective treatment strategy for the clinician's range of treatment options for primary molars. Therefore, aim of the present article is to enlighten all dentists about the concept of hall technique, a paradigm shift in the pediatric smart restorative dentistry.

Discussion

Under the realm of minimal intervention dentistry (MID), biological approaches for pediatric patients are advancing in rocket speed mainly focusing on preservation of tooth structure and maintaining function for long time till exfoliation of the primary teeth [5]. Hall technique is a non-invasive or minimally invasive method, biologically based, non-aerosol generating treatment procedure was first introduced in the literature by a Scottish based general dentist, Dr. Norna Hall in 2006 [6]. Due to its gentle approach, combined with the simplicity provides a comfortable and stress-free experience for young children.

The working hypothesis behind hall technique concept is associated with a simple mechanism comprising a straightforward biological principle [7]. Hall technique mainly arrests caries and protects the primary teeth till their exfoliation. Following hall technique, the superficial plaque layer, which is the most important layer in the biofilm for caries progression, is left and sealed along with the carious lesion. Later, the composition of the biofilm gets transformed to a less cariogenic flora, and there will not be any access to carbohydrates [8]. So, there is an unsustainable environment for bacterial survival thereby sealing and inactivating the lesion. As a result, hall technique may either arrest or at least slows down progression of caries in primary teeth.

It is well known fact that children's behavior and co-operation in pediatric dental practice is mainly determined by nature of the treatment [9]. Therefore, minimally invasive, faster and more comfortable treatments like hall technique is associated with enhanced patient co-operation and improved behavior. A recent study explored the influence of hall technique on children co-operation. It is clearly evident from the study results that major proportion of children exhibited extremely positive or positive behaviour increased gradually in subsequent dental appointments [10].

The advantages of hall technique are numerous. It is well-tolerated by children and more acceptable to parents with mild or no adverse effects reported [11]. Hall technique is a quick procedure that decreases anxiety in children. It improves pulpal health, more cost-effective and can be done in a single appointment. In this technique, an appropriate size of preformed stainless-steel crown is selected and filled with glass ionomer cement. Then the crown is fitted over the carious primary molar by dentists 'finger pressure, or the child's biting force. Although the same preformed stainless-steel crown is used in conventional procedures, but is associated with use of local anesthesia, tooth preparation and subsequent pain [12]. Therefore, all these factors are avoided in hall technique making the technique child-friendly procedure. Araujo et al in 2020 [12] in their school setting-based study evaluated two minimally invasives techniques such as atraumatic restorative treatment and the hall technique. Authors reported that both treatments can be carried out in a non-clinical setting and have the advantage of being non-aerosol producing procedures. The hall technique showed three times higher survival rates for restoring primary molar occluso-proximal cavities compared to atraumatic restorative treatment. And both treatment procedures were acceptable to child patients and their parents.

Literature shows a continuous debate among researchers and clinicians pertaining to the use of hall technique over conventional surgical or drilling procedures [10-18]. Hu et al [3] performed a systematic review and meta-analysis on hall technique to evaluate whether it can be considered as a standard technique for the treatment of carious primary molars. Out of eleven publications, five studies were considered for meta-analysis. Hall technique exhibited 80% success rate compared to direct restorations. Authors concluded that hall technique is a successful option for the treatment of proximal and multi-surface caries in primary teeth [3]. Another online questionnaire-based survey conducted among 709 dentists from 65 countries across the globe revealed that only half of the pediatric dentists who questioned have used the hall technique in their clinical practice [5]. However, this actual fact should be validated from evidence based randomized controlled trials Moreover, available evidence shows that the hall technique is a cost-effective alternative and has reflected positive outcomes in terms of acceptability and comfort from the patient [19].

In many countries across the globe, management of children with carious primary molars are done in secondary care settings or by specialists in private clinics. As a result, restorations performed by general dental practitioners exhibited fewer promising outcomes [20]. Therefore, increased occurrence of dental caries in primary teeth and its inadequate treatment has become a major public health problem in children which ultimately affects quality of children's lives. In traditional 'drill' and 'fill' restorative approach, local anesthesia is used for caries removal which may cause discomfort and anxiety in children especially in younger children [21]. Therefore, it is evident from the previous studies that elimination of local anesthesia usage in pediatric patients can significantly reduce anxiety and discomfort. As local anesthesia is not used in hall technique, invasiveness of that procedure is avoided and it brings better co-operation and more positive behavioral experience from the children. Moreover, in comparison to traditional methods hall technique does not require caries removal and tooth preparation.

In the initial appointment, orthodontic separators are placed between the contract point of the primary molar using two pieces of dental floss or the elastic separating pliers [22]. These separators are left in place for two days. Later separators are removed, and crown selection and its placement is done using appropriate luting agent. However, a Chi square analysis showed no relationship between the use of separators and the adequate fit of the crowns used in hall technique [6-8].

Due to larger pulp to crown ratio of primary molars compared to permanent molars, there is a reduced degree of pulpal protection. Therefore, selective caries removal is required in primary molars for the protection of the pulp. As this mechanism is followed in hall technique, the hypothesis behind the concept of hall technique remains controversial and gained popularity in the contemporary era of pediatric restorative dentistry [13].

Conclusion

In comparison to traditional restorative procedures, hall technique definitely represents a successful and effective option for restoring carious primary molars. Due to its many advantages such as its high longevity and superior patient acceptability, less invasive nature and less time consuming procedure, it can be translated as a true 'paradigm shift' in the contemporary era of pediatric smart restorative dentistry.

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