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Short Communication

Atraumatic Restorative Technique & its Role in the COVID-19 Pandemic

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Abstract

During the COVID-19 pandemic, we have seen drastic changes to the way we practice every day dentistry. The combination of Personal Protective Equipment (PPE) requirements for Aerosol Generating Procedures (AGPs) and the fallow time following has made routine dentistry much more difficult. Many practices have also had to spend thousands on air filtration systems.

In October 2020, a benchmark of 15-30 minutes' fallow time recommendation was endorsed by the Faculty of General Dental Practice UK. Furthermore, the pressure of delivering the 45% NHS contract value, has put practices under immense strain.

However, many of these AGP procedures- and consequent fallow times- can be avoided through adoption of the Atraumatic Restorative Technique (ART).

Studies have shown no significant differences in short-term survival percentages between ART and traditionally produced restorations for single-surface restorations in primary molars and posterior permanent teeth. However, there is insufficient evidence to support long-term success of the ART method.

Keywords: COVID-19; Dentistry; Single-surface restorations

Key Points

-ART is not considered to be an AGP, therefore requiring no fallow-time.

-ART could be used as an alternative to AGP treatments for restoring dentinal caries in primary and permanent teeth.

-Studies show no significant differences for short-term survival rates between ART and traditionally produced restorations for single-surface restorations in primary molars and posterior permanent teeth.

Introduction

Caries progression can be scored using the International Caries Detection and Assessment System (ICDAS) scale [1-3]. When caries is confined to enamel (ICDAS codes 1/2/3) it may be reversed by preventative interventions. However, once caries infiltrates outer dentine (ICDAS code 4) restorative intervention is indicated. Careful clinical and radiographic assessment is essential in this scenario to confirm no pulpal involvement [3].

Generally, many dental practitioners in the United Kingdom, will opt to use high-speed rotary to remove decay, for an ICDAS code 4 carious lesion affecting primary and permanent molars.

Caries removal using AGP and restoration [4]

- Relevant LA is administered.
- Tooth cleaned and isolated (cotton rolls/rubber dam).
- Access made using high-speed handpiece (>150,000 RPM) [5].
- Infected and affected dentinal caries is removed using slow-speed handpiece (<1000 RPM) [5].
- Suitable material placed into cavity.
- Margins and occlusion checked.

Following the COVID-19 pandemic, any dental professional delivering an AGP or present in the room must don full PPE (10). Many have reported that can be uncomfortable during longer procedures and affect performance. Following the procedure, there is a benchmark recommendation of 15-30 minutes' fallow time [1]. This causes delay in getting the next patient in.

The Atraumatic Restorative Treatment Method

Atraumatic Restorative Treatment (ART) was originally developed to restore caries in developing countries during the 1980's, as it requires no Local Anaesthetic (LA) or electricity [6]. It generates no aerosols and is not considered an AGP procedure.

Caries removal using ART and restoration [4]

- Tooth cleaned and isolated (cotton rolls/rubber dam).
- Dental hatchet is placed at entrance of carious lesion and rotated backwards and forwards, creating space for the excavator.

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- Infected dentinal caries removed using a suitable-sized excavator.
- High Viscosity Glass Ionomer Cement (HVGIC) is overfilled in cavity.
- Gloved finger is placed on cavity and pressure applied. Excess removed using carver.
- Margins and occlusion checked.

However, during the COVID-19 pandemic, this technique can be utilised to full effect. As it is not considered to be an AGP procedure, it omits the need for a fallow time and full PPE (including FFP3 masks or equivalent). This could potentially reduce the strain on dental practices and allow for more patient dental needs to be addressed, within a working day.

In addition, ART is found to be useful in children, elderly and special-needs patients, reducing the stress and anxiety associated with LA and dental drills [7].

Evidence for the Art Method

Several studies have compared the effectiveness of using ART to conventional rotary (AGP) methods, when restoring dentinal caries in permanent teeth.

ART restorations with HVGIC have shown high success in long-term follow-up studies for single surfaces, in the primary and permanent dentitions, with meta-analyses showing weighted mean annual failure percentages of 5% in primary molars over the first three years, and 4.1% over the first five years in permanent posterior teeth [8]. Furthermore, a recent systematic review reported no significant differences in survival percentages between ART and traditionally produced multiple-surface restorations for single-surface restorations in primary molars and posterior permanent teeth [2].

However, there are few studies yet, to show that ART is an effective long-term management method for caries management in permanent teeth.

Conclusion

Careful radiographic and clinical assessment is key in diagnosing dental caries. When a cavitated carious lesion infiltrates dentine- but not pulp- the ART technique is indicated. Though its use in developed countries is not popular, in the current situation we face it should be considered. It does not necessitate the need for an AGP procedure and the strict requirements that follow this. Furthermore, it is favoured by many patients to conventional restorative techniques. Performed well, it can achieve the same efficacy as alternative treatments short-term, as evidenced by several studies. Therefore, especially during the COVID-19 pandemic, its use can benefit dental practitioners and our patients.

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