

What's New in the Benefits of Restoring Primary Teeth?

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Introduction

Primary teeth erupt between the age of 6 months and 3 years and gradually exfoliate when permanent teeth replace them between the age of 6 and 12 years. A traditional assumption has been that primary teeth with carious lesions should be restored by removing infected tissue and replacing it with appropriate dental material. This practice, however, has been questioned recently. In developing countries, there have been no resources to treat primary teeth other than by extraction when pain and/or infection occurs [1]. In industrialized countries, the treatment of primary teeth is commonly provided when a child has a mixed dentition (both primary and permanent teeth) [2]. Yet early childhood caries, at the age of 3–5 years, is still very common, e.g. in Kuwait 32.4% of 3-year-olds have caries [3].

A Retrospective Study Showed No Evidence for the Benefits of Restoring Primary Teeth

Tickle et al. [4] conducted a retrospective study of children (n = 677) who received their dental treatment from 50 general dental practitioners (GDP) in the northwest of England. Inclusion criteria were a minimum of 10 and maximum of 20 patients who had been in the care of the same GDP from 5 years or younger up to the age of 14 years. All children included had a history of approximal caries. Outcomes were extraction due to pain or sepsis, or exfoliation and the possible prescription of antibiotics. A total of 4,056 teeth were recorded as either carious or treated. Extractions were common; 44% of teeth were extracted, but only 11.7% due to pain or sepsis. During their lifetime, 3,145 teeth were restored, 81.1% of the first and 84.3% of the second molars, but only 40.5% of primary carious anterior teeth were re-

stored. Surprisingly, there was no difference in teeth extracted, whatever treatment method was used; neither was there any difference in the number of filled or unfilled carious teeth that resulted in a prescription of antibiotics.

Sealing Caries Lesion to Stop Its Progress

Another study [5], a randomized controlled clinical trial in Scotland, showed that the conventional caries treatment of primary teeth seems unjustified. This trial used a specific new 'Hall' technique [6], a simplified method of using preformed metal crowns cemented with no local anaesthesia, caries removal or tooth preparation. The study was a GDP-based, split-mouth randomized controlled trial of 132 children, aged 3–10 years, and compared the acceptability and clinical outcome of the Hall technique with conventional restorations. This technique was preferred to conventional restorations by the majority of children, caregivers and GDPs and showed better outcomes for pulpal health and longevity of restorations than conventional restorations. The results were expected according to the current paradigm of caries aetiology [7], where carious tooth tissue does not need to be removed but rather isolated from the oral environment. This had been shown earlier by a prospective study of sealing the occlusal dentine caries lesions, where the caries did not progress [8].

Cochrane Review Critical of the Conventional Caries Treatment

Quite conclusive and critical evidence was recently published as a Cochrane review [9]. Three groups of studies applying conventional restorations were compared: (1) remove no caries and seal the decay into the tooth, (2) remove

minimal (ultraconservative) caries at the cavity entrance and seal the remaining caries in or (3) remove caries in two visits some months apart to allow time for the pulp to form reparative dentine (the stepwise excavation technique). This systematic review aimed to compare the incidence of damage to the nerve of the tooth (pulp), progression of decay and longevity of restorations, irrespective of whether the removal of decay had been minimal or complete. The review concluded that partial caries removal is preferable to complete caries removal for deep lesions to reduce the risk of caries exposure to the pulp. Pulp exposure can be considered an iatrogenic effect, which should not happen.

Filling Children's Teeth: Indicated Or Not (FiCTION) Trial Has Started

Because of the nonexistence of conclusive evidence for the most effective approach to manage decay in primary teeth, a special clinical trial: 'Filling Children's Teeth: Indicated Or Not (FiCTION)' [10] was planned in the UK to answer the question of whether primary teeth should be treated. This trial started in 2011; the target number of children is 200 and the anticipated end date is 2016. The study hypothesis is: 'what is the relative clinical and cost effectiveness of conventional filling of caries in primary teeth vs. no treatment vs. an intermediate treatment strategy based on the biological management of caries?' Consenting children attending for regular dental care are randomly assigned to one of three treatment groups: (1) conventional fillings, (2) intermediate fillings or (3) no fillings. The children are to be reviewed annually (and at any extra dental visit) for episodes of dental pain and abscess formation. The impact of caries and its treatment on the quality of life of the children will be assessed. The follow-up period is 4 years. Inclusion criteria are: (1) children aged 3–7 years; (2) at least one tooth with decay into dentine (assessed by GDP and defined by the International Caries Detection and Assessment System, ICDAS, codes 3, 4, 5 and

6); (3) at least one primary molar tooth, and (4) willingness to be examined and have bitewing X-rays taken. Exclusion criteria are: (1) patients with either toothache or sepsis; (2) patients accompanied by an adult who lacks capacity to give informed consent, and (3) patients with a medical condition. The setting of this study is primary dental care, where most children's dentistry is carried out in the UK. The trial is being conducted in practices throughout the UK: inner-city London, the North of England, Wales and Scotland. The goal is to make a firm recommendation regarding the most effective approach for managing caries in primary teeth. Obviously, the main ethical concern is the 'no filling' arm. This is justified because of the lack of an evidence base for any of the three treatment methods. Currently only 10% of cavities in 5-year-olds in the UK are filled, and placing a conventional filling is often unpleasant for the child. The primary outcome measures are: (1) number of children experiencing dental pain, assessed by the Dental Discomfort Questionnaire and (2) number of children experiencing dental sepsis, assessed by clinical examination (child's own dentist) and radiographic signs (independent blinded assessor). The secondary outcome measures are: (1) measurements of caries experience, assessed with ICDAS; (2) child's quality of life, assessed by the Parental-Caregivers Perceptions Questionnaire; (3) child's global rating of oral health and impact on everyday life; (4) child's dental anxiety, assessed by the Modified Child Dental Anxiety Scale; (5) NHS costs of dental visits and treatment, and (6) parental/family costs of dental visits and treatment. The trial team is multidisciplinary, involving half of the UK dental schools as well as acknowledged experts in other relevant fields, and most members have experience with clinical trials.

The trial is expected to answer the question of whether or not to restore primary teeth. The results will have important implications for the care of children with dental caries and, since dental caries is such a common disease, there will also be implications for service management.

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