

An investigation into sealant restoration usage in general dental practice in England

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Aim A study was undertaken to investigate attitudes to sealant restorations and their usage in general dental practice in England.

Method Seventy three dentists in three areas (Doncaster, Hereford/Worcester and Wycombe) provided retrospective details of treatment provided over a one year period for 4,250 6–12 and 13–15 year old subjects. Fifty nine of these dentists then completed a telephone questionnaire relating to their treatment patterns and attitudes to sealant restorations.

Results The treatment data indicated that only 59 of the 4,250 children received a sealant restoration during the study period. Of the 44 dentists who claimed in the questionnaire to be using sealant restorations, only 28 had placed them in their selected patients.

Conclusions Positive attitudes to sealant restorations were expressed but also concerns that may be prejudicing usage.

The concept of the sealant restoration was introduced during the 1970s by Simonsen and represented a major development in the treatment of minimal pit and fissure caries.¹ It is a conservative form of treatment involving minimal tooth preparation, with removal of carious tissue only. The cavity may then be restored with composite, glass-ionomer or a combination of both materials (the laminate technique). This is combined with a preventive procedure in the form of a fissure sealant applied over the remaining sound pits and fissures.

Debate exists over whether the term, 'sealant restoration' should be used over the more established term, 'preventive resin restoration'. However, since the 1970s there have been rapid advances in material science providing dentists with a range of restoratives other than the use of conventional composite resins. The authors, therefore, consider that the term, 'sealant restoration' more accurately describes the technique.

Problems are encountered during epidemiological surveys when estimating accurate figures for the use of sealant restorations in general dental practice, as there are difficulties in differentiating them from fissure sealants, particularly if teeth are sealed with opaque sealants.² Therefore, current usage figures in England rely on dentists' reports rather than prevalence data. Usage rates from Scotland are available which indicate that dentists were quickly making use of this new technique when it was introduced into the General Dental Service (GDS) fee scale.³ Surprisingly, there are no published reports of sealant restoration placement specifically among general dental practitioners (GDPs) in England.

Aims

The aims of the study were:

- To investigate by means of a telephone questionnaire the attitudes and patterns of practice of GDPs regarding sealant restorations in three areas of England.
- To elucidate sealant restoration usage figures obtained from patient records and to compare these with data obtained from the telephone questionnaire.

Method

In the first part of the study, 75 dentists were randomly selected from Family Health Service Authority (FHSA) lists in three areas of England: Doncaster representing a northern urban community; Hereford/Worcester representing a rural population; Wycombe representing a commuter suburban population. Seventy-three dentists agreed to participate (25 in Wycombe, 24 in Doncaster and 24 in Hereford/Worcester), giving a response rate of 97%.

For each participating dentist, the Dental Practice Board provided a list of children registered under capitation with that dentist. The children were divided into two age groups 6–12 years and 13–15 years and a random sample of 30 patients in each age group was selected. The two age groups were chosen so that data could be gathered for the first and second permanent molar teeth.

Of the 4,380 patient details requested, the dentists provided retrospective details of treatment carried out over a one-year period during 1996 for a total of 4,250 6–12- and 13–15-year-old subjects (response rate 97%). For each subject the dentist recorded the number and type of sealant restoration provided on a specifically designed data collection form, using the patient's FP25 treatment record card as a guide.

In the second part of the study, the 73 participating dentists were asked to complete a telephone questionnaire relating to their treatment patterns and attitudes regarding sealant restorations. The questionnaire was designed according to established criteria^{4,5} to gather as much information as possible, bearing in mind the time constraints of GDPs and the limited attention span inherent in telephone questionnaires. It contained both structured and open ended questions and was initially piloted among ten practitioners in the Manchester and Stockport FHSA areas.

The participating dentists were contacted to arrange a suitable time for the telephone questionnaire to be completed in an unhurried manner. The interviews were conducted by the same person (a qualified dental nurse and dental health educator experienced in interview techniques) to eliminate a possible source of bias.

Results

Validity of the data collection form

The data collection forms were collected from each practice. Four randomly chosen forms were selected and comparisons made of the data on the form with the data contained on the patient record card. The percentage agreement between the data collection form and the

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REFEREED PAPER

Received 20.12.00; Accepted 22.03.01

© British Dental Journal 2001; 191: 388–390

Table 1 Perceived benefits of dentists regarding sealant restorations (n = 44)

Response	Number	Percentage
Conserves tooth tissue	18	41
Aesthetic restoration	15	34
Mercury free	9	20
Fluoride release from glass-ionomer	8	18
Combined restorative and preventive procedure	8	18
Better marginal seal than amalgam	4	9

(As some dentists expressed more than one benefit the percentage total is greater than 100%)

FP25 patient record card for sealant restorations was 99% with a Kappa value of 0.93, demonstrating excellent levels of agreement.

Telephone questionnaire results

Of the 73 dentists who provided treatment data, 59 dentists completed the telephone questionnaire, giving a response rate of 81%.

Of the dentists who completed the questionnaire, 44 (75%) stated that they were placing sealant restorations on their child patients.

The most popular type of sealant restoration was the sealant and composite type (GDS Item 14e2) with 43% of dentists predominately using this variety (n = 19). Thirty-nine per cent (n = 17) of dentists principally used the sealant and glass-ionomer type (GDS Item 14e3) and 18% (n = 8) predominately used the laminate sealant restoration utilising sealant, composite and glass-ionomer (GDS Item 14e4).

Fifteen dentists (25%) were not providing sealant restorations, the reasons being:

- concerns over long-term results;
- amalgam considered a better choice of restorative material;
- ease of use of amalgam as a restorative material.

Perceived benefits of sealant restorations

The two principal perceived benefits of sealant restorations were the conservative nature of the technique and its aesthetic advantages (Table 1). Benefits were also expressed regarding the potential of fluoride release if glass-ionomer is used, the elimination of possible mercury toxicity as amalgam is not used and the combined restorative and preventive nature of the procedure.

Concerns regarding sealant restorations

A number of concerns were expressed regarding sealant restorations (Table 2). The principal concern was regarding the long-term success of sealant restorations. Concerns were also expressed regarding the difficulties of complete caries removal from minimal preparations and difficulties encountered with moisture control during placement.

Sources of information regarding sealant restorations

Dental journals represented the major source of information regarding sealant restorations (Table 3). Postgraduate courses and the undergraduate curriculum were also important sources of information.

Treatment results.

The treatment data indicated that only 59 out of the 4,250 selected subjects received a sealant restoration during the one-year study

Table 2 Perceived concerns of dentists regarding sealant restorations (n = 22)

Response	Number	Percentage
Long-term results of sealant restorations	13	59
Incomplete caries removal from minimal preparation	4	18
Moisture control difficulties	3	14
Cost effectiveness under capitation	2	9
Recurrent caries	2	9
Marginal shrinkage of composites	2	9

(As some dentists expressed more than one concern the percentage total is greater than 100%)

Table 3 Sources of information for participating dentists regarding sealant restorations (n = 44)

Source of information	Number	Percentage
Dental journals	31	70
Postgraduate courses	21	48
Undergraduate course	9	20
Trade fairs	7	16
Videos	4	9
Other sources	14	32

(As some dentists gave more than one source of information the percentage total is greater than 100%)

period (Table 4). A total of 96 restorations were placed. The most popular type of sealant restoration was the composite type, confirming the questionnaire data. Thirty-four subjects received this type of sealant restoration, 20 subjects received the glass-ionomer type and five subjects received the laminate type.

Validation of claimed sealant restoration usage.

Seventy-five per cent of those dentists who completed the questionnaire (n = 44) claimed to be using sealant restorations on their child patients. However, the treatment data reveals that only 64% of these dentists (n = 28) placed any sealant restorations on their selected child patients during the one-year study period.

Discussion

Of the dentists who completed the questionnaire, 75% claimed to be using sealant restorations, which compares favourably with claimed usage rates among dentists in Scotland.^{6,7} The usage figures for Scotland have been confirmed independently by returns from the Scottish Dental Estimates Board.⁸

However, the patterns of treatment data indicate that of these 44 dentists who claimed to be using sealant restorations on their child patients, only 28 placed any on their selected patients during the study period.

The treatment data and questionnaire indicate that dentists preferred to place the more established form of sealant restoration utilising sealant and composite as the restorative. However, a number of dentists were using the glass-ionomer or the laminate type of sealant restoration, considering the release of fluoride from glass-ionomers to be beneficial.

The questionnaire revealed a number of perceived benefits and positive attitudes towards sealant restorations, in particular the

Table 4 Number and type of sealant restorations (SR) placed during the study period for all children in the three study areas

Type of sealant restoration	Number of subjects SRs placed	Mean SRs per subject	Standard deviation	Minimum	Maximum
Sealant and composite (GDS Item 14e2)	34 (0.8%)	1.4	0.8	1	4
Sealant and glass-ionomer (GDS Item 14e3)	20 (0.5%)	2.1	1.2	1	4
Sealant and composite and glass-ionomer (GDS Item 14e4)	5 (0.1%)	1.2	0.4	1	2

preservation of tooth structure and the aesthetic nature of the technique, which is encouraging (Table 1). Dramatic increases in sealant usage among dentists in these study areas have been demonstrated,⁹ which is in line with national trends.¹⁰ It is possible that this may be indicating a more preventive philosophy among these dentists.

The study indicates that sealant restoration usage in general dental practice may be low and that at present dentists are more reluctant to embrace this procedure than fissure sealing. However, dentists in England were also initially slow to adopt the use of fissure sealants, as indicated nationally in the 1983 United Kingdom National Children's Survey¹¹ and in a 1989 investigation conducted in the three study regions.¹²

The study indicates a number of concerns that may be prejudicing sealant restoration usage in general practice (Table 2), in particular long-term results regarding sealant restorations. The available literature does not support these concerns.

It should be considered, however, that the patterns of treatment data represents only a single year 'snap shot' in a patient's total dental history and therefore does not give a totally comprehensive picture of sealant restoration usage.

At a time when response rates to questionnaires are under review,¹³ the study would appear to indicate that data obtained from questionnaires should be viewed with some caution.

It is apparent that further studies need to be undertaken to monitor the attitudes of general practitioners to sealant restorations and usage rates.

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