The primary outcomes measured were esthetic improvement and safety.

RESULTS

Compared to no treatment, bleaching improved all colorimetric aspects. Fewer bleached fluorotic areas had discernible color differences from healthy enamel, but the difference did not reach statistical significance.

When comparisons were made between interventions, bleaching was used as the reference intervention. Microabrasion had significantly smaller esthetic improvement in fluorotic stains 6 months after treatment than were seen with bleaching. The difference was clinically relevant. No difference was found with regard to tooth sensitivity between the 2 methods.

When resin infiltration for various durations or resin infiltration combined with bleaching was compared to bleaching, clinically and statistically greater esthetic improvements were seen for resin infiltration. Fluorotic stain improvement was also greater with the resin infiltration than with the bleaching alone. It was determined that increasing the time for resin infiltration or combining it with bleaching was unlikely to produce better results than the use of resin infiltration alone.

The adverse effects reported include a very mild transient tooth sensitivity after microabrasion or bleaching that subsided after about 1 month. Transient signs of minimal gingival irritation were seen after microabrasion or a combination of microabrasion and bleaching.

DISCUSSION

The most effective means for treating mildly to moderately severe dental fluorosis lesions involves resin infiltration. Bleaching was the runner-up, with microabrasion producing the least impressive results.

Clinical Significance

Conventional resin infiltration was better at managing dental fluorosis lesions than the use of bleaching, microabrasion, or longer application times for resin infiltration. The safety of all these approaches was unquestioned. All of the adverse effects were minimal and limited in duration. Further studies are needed because the available evidence had a moderate to high risk of bias.

Di Giovanni T, Eliades T, Papageorgiou SN: Interventions for dental fluorosis: A systematic review. *J Esthet Restor Dent* 30:502-508, 2018

Reprints available from SN Papageorgiou, Clinic of Orthodontics and Pediatric Dentistry, Ctr of Dental Medicine, Univ of Zurich, Plattenstrasse 11, Zurich 8032, Switzerland; e-mail: snpapage@gmail.com

DENTAL IMAGING

Cone beam computed tomography

BACKGROUND

Cone beam computed tomography (CBCT) offers cross-sectional imaging with potentially high geometric accuracy that can prove especially useful for dentists planning implant treatment. It also has other uses relevant to dental practice. The major drawback is its higher radiation dose compared to conventional dental radiographs, which has led to concern about its use especially for young patients. A survey was conducted to determine the uses for CBCT in dental practices in the United Kingdom, its optimization, and training for its use.

METHODS

The survey was distributed to 144 practices, of which 49% responded (71 completed surveys). It was possible to reply online or on paper, and most (76%) chose paper. The results were reported according to the questions asked, which numbered 28.

RESULTS

The number of dentists in the practices surveyed ranged from 1 to 26, with the modal number being 4. Fewer dentists in the same practice used CBCT frequently. Fifty-two of the practices reported that just 1 or 2 dentists used CBCT frequently.

Twenty-six different CBCT scanner models from 8 manufacturers were used. None of the respondents had more than 1 CBCT scanner in the practice. Fifty-four practices had had the scanner for less than 5 years, with a third having it for less than 1 year. Sixteen percent of the practices limited its use to their own patients and the rest accepted external referrals.

Table 5. The Underlying Clinical Reasons for the CBCT Examination of the Last 5 Patients in the Dental Practices. The First Column Shows the Primary (First Stated) Reason, in the Format Listed on the Survey. The Second Column Shows the Additional Reasons When These Were Given by the Respondents. The Total Number is Below the Maximum 355 Possible Answers as 2 Responders Only Provided 4 Answers.

Primary clinical reason for CBCT	Number of responses	Other clinical reasons given for CBCT when combinations of reasons stated	Number of responses	Combined number of responses
Implant planning	235	Endodontic diagnosis; Root resorption	5	243
		Unerupted tooth localisation	3	
Implant planning; Other implant-related purpose	52	Periapical inflammatory pathosis diagnosis	1	56
		Unerupted tooth location	1	
		Endodontic diagnosis	2	
Other implant-related purpose	12			12
Endodontic diagnosis	16	Root resorption	2	19
		Periapical inflammatory pathosis diagnosis	1	
Unerupted tooth localisation	17			17
Periapical inflammatory pathosis diagnosis	3			3
Other	3	Orthodontic diagnosis	2	3
		Periodontal defect imaging prior to surgery	1	
Totals	335			353

(Courtesy of Yalda FA, Holroyd J, Islam M, et al: Current practice in the use of cone beam computed tomography: A survey of UK dental practices. *Br Dent J* 226:115-124, 2019.)

The most commonly used fields of view (FOVs) were small (a size sufficient to image 1 or a few teeth and their supporting bone) or medium (imaging 1 jaw or a full quadrant). Intra-oral and/or panoramic conventional radiographs of patients were always available to the dentist at some point before the CBCT examination was done in 26 of the practices. The majority of patients in 34 practices also had undergone conventional radiographs. Most clinics reported scanning 1 to10 adult patients monthly, with 11.2% scanning more than 20 adult patients in a month.

The most common reason for doing a CBCT examination in adult patients was implant planning. One practice reported the reason as endodontic assessment and 8 reported a combination of reasons. For all of these combinations, implant planning was included.

Most of the respondents couldn't provide the detailed exposure factor settings for adult patients. The majority used preprogrammed settings. Five had an automatic exposure control (AEC) that they used.

Over 90 percent of the respondents didn't perform CBCT examinations on children. Six respondents did, with the most common reasons given as impacted tooth localization, orthodontic diagnosis, implant planning, and use as a panorama view for diagnosis when the patient couldn't tolerate bite-wings. Just 1 of these 6 practices could cite exact exposure values for children. In this case the exposure time and tube current were both reduced compared to values for adults.

When asked to specify the details of the clinical reason for doing a CBCT examination on their last 5 patients who had scans, the primary reason was implant planning and other implant-related purposes for nearly 85% of the practices (Table 5). Fifteen patients were scanned for a combination of reasons.

Ninety-six percent of the practices did not use a lead or lead-equivalent thyroid shield for patients being scanned. In addition,

Clinical Significance

This UK survey indicates that CBCT scanning is definitely not being used excessively. In addition, typical CBCT scans are done only for implant-related reasons. Most use small or medium FOVs and involve adult patients only. It would be reassuring to know that the dentist and staff understand the technical knowledge relevant to use of the scanner and interpretation of its results, as well as the use of shielding for patients. Surveys done in other countries would allow interesting comparisons of many of the factors covered in this study.

the same percentage of practices didn't use a lead or lead-equivalent apron.

In 63 dental practices, the dentist always or usually performed the CBCT reporting. No significant difference was found between the proportions of scans using larger or smaller FOVs that had the results conveyed by dentists. In addition, none of the respondents stated that only the dentist had enough information to report CBCT images and did so without additional training.

DISCUSSION

As more dental practices acquire CBCT scanners, more patients will be scanned. Concerns have been raised over the increased exposure to radiation, but this survey adds concerns over the sufficiency of the dentist's training to read CBCT scans, the appropriate use of CBCT scanners, the provision of sufficient shielding to patients being scanned, and the technical knowledge of those in the dental practices. This survey reported only a small number of patients actually being scanned, which raises the question of whether it is cost-effective to own a CBCT scanner.

Yalda FA, Holroyd J, Islam M, et al: Current practice in the use of cone beam computed tomography: A survey of UK dental practices. *Br Dent J* 226:115-124, 2019

Reprints available from FA Yalda, The Univ of Manchester, Manchester Academic Health Science Ctr, Manchester M13 9PL; e-mail: dr-fedil@hotmail.com

FIXED PROSTHODONTICS

Crown types

BACKGROUND

With the development of a wide range of different types of crowns it has become more difficult to select the correct one for a specific case. This has caused significant and frustrating confusion for dental laboratories as well as dentists. A brief list of categories of crowns currently in use was offered, with recommendations based on the available research and experience.

TYPES OF CROWNS

The Clinicians Report Foundation offers long-term in vivo research for most of the restorations listed, but there is always the possibility that more recent research will give different findings. The current clinical findings in terms of acceptability rank the crowns as follows: cast gold alloy; porcelain fused to metal (PFM); full-strength zirconia (includes 3Y zirconia, BruxAir Solid Zirconia, and generation I zirconia); lithium disilicate (IPS e.max); veneered full-strength zirconia (zirconia-based); lithium silicate; translucent zirconia; and resin-nanoceramic. The last 4 of these choices are new and cannot yet be evaluated confidently. However, early reports confirm various challenges.

Cast Gold Alloy

Cast gold alloy has the most data regarding longevity of all the crown types and can serve acceptably for 40 years or longer. They cause little or no wear of the opposing dentition if the alloy is appropriate and used correctly, can produce nearly perfectly closed margins, have little or no allergenic potential, and demonstrate good gingival acceptance. These restorations are not esthetic, which results in their use in fewer than 5% of the indirect restorations placed in the United States. Dentists tend to be the primary remaining recipients of cast gold alloy crowns.

PFM

PFM restorations have moderate longevity, lasting at least 20 years, and have moderate to very good esthetics until the glaze and stain wear off. They have moderate to excellent strength, and, as long as base metal is not used, few allergic reactions are associated with PFM crowns. Their drawbacks include occasional chipping and debonding of the ceramic from the metal, diminished color acceptability with age, and moderate to extreme wear of opposing teeth when older feldspathic ceramics are used.

Full-strength Zirconia

Full-strength zirconia has been available for about 10 years, and the 3Y version now dominates among crown use in the United States. Studies of its performance go back about 9 years and find outstanding clinical service. 3Y zirconia has been used successfully in many industrial situations for over 25 years. The advantages of this material include very high strength, ability to perform well in multiunit fixed prostheses, low manufacturing cost, few clinical problems, minimal laboratory fees, and low wear on the opposing dentition if the restoration is not glazed. Gingival irritation and allergic reactions are almost never seen. Esthetics have been addressed by staining presintered zirconia, which then delivers the desired pigments into the internal zirconia structure.