

Clinical evaluation

Trevor Burke and Russell Crisp present a clinical evaluation of SDI Zipbond by the PREP Panel.



Dental clinicians need adhesive materials, as these facilitate minimally invasive class II cavity preparations, the use of resin-based tooth coloured restorative materials (which are increasingly requested by patients), non-preparation cervical restorations, the build-up of fractured or worn anterior and posterior teeth, notwithstanding indirect techniques such as resin-retained bridges or where there is a short clinical crown for full or partial coverage restorations. Furthermore,

in the present era of the coronavirus pandemic, direct-placement adhesive dentistry may often be carried out without the use of an aerosol-generating turbine handpiece, which will reduce surgery turnaround time between patients.

It is therefore the purpose of this paper to examine the clinical handling of a recently released universal bonding agent, Zipbond, manufactured by SDI.

Methods

Members of the PREP Panel were

contacted in September 2019 regarding their participation in a new handling evaluation. Of those who expressed an interest in taking part in the evaluation, nine members were selected. A questionnaire was designed jointly by the PREP Panel co-ordinators and the sponsors of the project, SDI, with the objective to assess the respondents' views on the handling and ease of use of the material. Explanatory letters, questionnaires and packs of the SDI Zipbond, in both single unit dose and bottle presentations, were distributed in mid-January 2020. The practitioners were asked to use the material for 10 weeks and return the questionnaire.

Of the nine members selected from the PREP panel, two were

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female, and the average time since graduation was 27 years, with a range of 24 to 33 years.

Results

All the evaluators currently used a dentine/enamel bonding system, with a variety of systems being used. Reasons for the choice of these materials were, primarily, ease of use and good results. Other reasons were manufacturer's reputation, previous PREP Panel evaluation, familiarity and "issued by employer." One evaluator used more than one system.

When the evaluators were asked to rate the ease of use of the bonding system used prior to the evaluation, the result was as follows:



The evaluators were asked how many dentine-bonded restorations they placed in a typical week with five placing between 16 and 20, three placing 10 to 15 and one placing more than 20.

78 per cent (n=7) of the evaluators stated that they preferred a bottle presentation, with the remaining 29 per cent (n=2) preferring a single-unit dose presentation.

67 per cent (n=6) of the evaluators stated that they would not be prepared to pay extra for the convenience of single-unit doses.

System ease of use

The evaluators rated the presentation as follows:



Comments:

- "Basic packaging – I liked. Not much waste. Nurse initially struggled to get into unidose container."
- "Took a while to work out how to use single dose capsule."
- "Bottle and single dose both good."

When the evaluators were asked to rate the instructions, the result was as follows:



Comments:

- "Single dose instructions not as clear as the bottle ones."
- "Once we understood the single dose instructions it was easy."

The bottle dispenser was stated to be easy to use by all (100 per cent) of the evaluators.

The cleanliness and ease of cleaning the bottle was rated as follows:



The ease of use of the single dose presentation of Zipbond was rated as follows:



Comment:

- "Easy to topple."

When the evaluators were asked if the amount in the single dose was satisfactory, all evaluators (100 per cent) stated that it was. One comment was made:

- "But not for very large or multiple procedures."

A total of 593 restorations were placed using Zipbond, comprised as follows:

- Class I – 149
- Class II – 186
- Class III – 96
- Class IV – 104
- Class V – 58

When the evaluators were asked if they used Zipbond for any other applications the result was as follows:

- For bonding indirect restorations – three evaluators
- Treatment of dentinal hypersensitivity – five evaluators
- Bonded amalgams – four evaluators

Other uses were stated to be "for bonding orthodontic retainers."

The evaluators stated that in percentage terms, the mode of application of SDI Zipbond was as follows:

- Self-etch – 13 per cent (range zero to 60)
- Total etch – 43 per cent (range zero to 90)
- Selective enamel etch – 44 per cent (range 10 to 100)

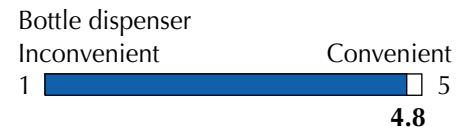
All the evaluators stated that the bottle and nozzle worked satisfactorily,

the resin liquid easily wet the tooth surface and that the bond was easily visible on the tooth surface.

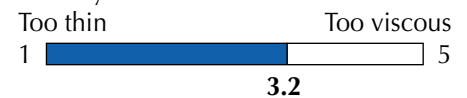
Comments:

- "Easy to visualise."
- "Sometimes need to nudge the bottle to get it out."
- "It's yellow and has a distinct smell."

When the evaluators were asked to rate their and their dental nurses' assessment of the dispensing and handling of SDI Zipbond, the result was as follows:



The viscosity of the bonding liquid was rated by the evaluators as follows:



89 per cent of the evaluators (n=8) stated that the SDI Zipbond liquid stayed in place when placed on the tooth surface. All of these eight evaluators stated this was an advantage over other bonding adhesives

Six of the evaluators (67 per cent) stated that the application of SDI Zipbond was better than the application of other bonding adhesives they had used. Of the remaining evaluators, one stated it was less messy, one stated it was more messy and one stated it was the same.

Comment:

- "Liked the way you could apply it. Felt good and controlled as you could see where you had been with it."
- Eighty-nine per cent of the evaluators (n=8) stated that their dental nurses did not experience any difficulties using SDI Zipbond.

Comment:

- "Took a while to work out how to use the single dose compule."

The one-component aspect of SDI Zipbond was stated to be an advantage over other systems by 100 per cent

Of the evaluators. With regard to time taken for placement of the bond, 56 per cent (n=5) stated that SDI Zipbond was the same to use as other bonding systems they had used, three evaluators (33 per cent) stated it was faster and the remaining evaluator stated it slower.

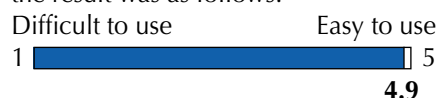
No evaluators reported any instances of post-operative sensitivity.

All (n=9) of the evaluators stated that they would purchase SDI Zipbond if available at average price.

When they were asked if there were any changes the considered essential to the acceptability of the material the following comments were made:

- “None.”
- “Make single dose compule easier to use – may have been just my inexperience using them.”
- “Packaging of single dose compules a little bulky.”

When the evaluators were asked to rate the ease of use of SDI Zipbond, the result was as follows:



Final comments:

- “Great aesthetics – no shadows at the margins.”
- “Very impressed with this material. It had good viscosity and was easily visualised on the tooth surface. No post-operative sensitivity.”
- “An orthodontic retainer (etched first) did debond quite quickly.”
- “Flows better and less viscous than some other materials. A very good material.”
- “My colleagues and I particularly liked it on incisors as it is less likely to ‘yellow’ the tooth surface than some other materials.”
- “In the current Covid-19 urgent care role we used SDI Zipbond in its self-etching capacity, dried with high-speed suction. This avoids acid etch spray/aerosols etc and is therefore very useful in a non-aerosol generating procedures.”
- “Quite liked the material. Will be good to see how the restorations stay bonded over time. No failures so far, so looking good.”
- “I am happy to endorse this bonding agent – it was a little less smelly than some others (unless I was suffering



from Covid!”

Discussion

The SDI Zipbond universal bonding system has been subjected to an extensive evaluation in clinical practice by members of the PREP panel, in which 593 restorations were placed. These creditable numbers were achieved despite around two weeks of the 10-week evaluation period being lost because of the closure of UK dental practices due to the Covid-19 pandemic. It was interesting to note the high dependence on adhesive techniques reported by the evaluators, which will stand them in good stead in their return to work in the new norm of reduced or no-aerosol dental practice. It was also interesting to note that 78 per cent of the evaluators preferred the bottle version of the material over the unidose presentation. It might be considered that this was due to environmental concerns over disposing of a plastic container after use of the individual dose of material, but it appears that they were not prepared to pay extra for the convenience of single-unit doses. Other aspects of the evaluation worth highlighting are:

- The presentation of the material and the instructions scored highly (both 4.6) on visual analogue scales

where 5 = excellent and 1 = poor).

- SDI Zipbond was rated better by the evaluators for ease of use when compared with the previously-used adhesive system, (4.9 vs 4.7 on a visual analogue scale where 5 = easy to use and 1 = difficult to use).
- A near ideal score for viscosity (3.2 on a visual analogue scale where 5 = too viscous and 1 = too thin) was achieved.
- All of the evaluators stated they would purchase SDI Zipbond if available at an average price.
- In the current Covid-19 pandemic, mention was made by one evaluator at an urgent dental care centre of the usefulness of the self-etch capacity of SDI Zipbond.

Conclusion

The good reception of SDI Zipbond was clear from the high scores achieved and the fact that all of the evaluators would purchase the material if available at average cost.

Acknowledgement

We are grateful to the responding evaluators for their help with this project, and in managing to return the questionnaires in the current difficult situation for dental practices in the UK. Thanks are also due to SDI for financial support for this evaluation.