

Seven Year Results With Direct, Single-visit, Ceramic Inlays (Cerana)

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INTRODUCTION

Ceramic materials provide aesthetic restorations which are able to withstand the oral environment but two appointments are needed to fabricate traditional ceramic restorations by means of an indirect technique. However, single-visit systems are becoming available and one technique, *Cerana* (Nordiska Dental, Sweden), utilises matched drills with pre-etched and silanated leucite inlays. The final restoration consists of a leucite inlay luted with a restorative composite resin.

Early results were promising and following this a prospective longitudinal trial was set up. This poster presents data which was available up to March 2003 and includes *Cerana* restorations up to 7 years old.

METHODS

This prospective longitudinal study was initiated in 1996 to investigate the use and longevity of *Cerana* restorations. The results over 7 years from this study of the 33 *Cerana* restorations (25 class I, 8 class II) are presented. They were all placed by two operators using a single restorative material and common protocol.

Restorations were reviewed annually and assessed by two examiners using modified USPHS criteria for:

- anatomical form (AF) A-C
- marginal adaptation (MA) A-D
- surface roughness (SR) A-D
- marginal discoloration (MD) A-C
- colour match (CM) A-C
- discomfort (DT) A-D



Illustrations of the *Cerana* system and examples of its application in cases taken from this study.

RESULTS

Table 1 shows the A and B grades at each annual review. No C or D scores were given by the two examiners. Figure 2 shows the percentage of A scores at each review to allow easier comparisons to be made and trends to be observed.

Anatomical Form was maintained in all restorations except for one fractured marginal ridge.

Marginal adaptation of the inlays was excellent where the ceramic fitted up to the enamel margin but composite was lost where exposed in 80% restorations.

Surface Roughness increased to a B score for 90% inlays. None were grade C or D.

Marginal Discolouration remained A for 80% of *Cerana* restorations. Grade B was observed in 20% due to staining between composite resin and enamel, none between insert and composite. None were graded C or D.

Colour Match was stable in all cases. There was no colour change in any of the *Cerana* restorations. They all remained the original shade which is close to Vita A2 for the pure leucite inlays. A shaded version, Vita 3.5 has now been made available.

Discomfort remained nil in all cases for all restorations over the whole study period.

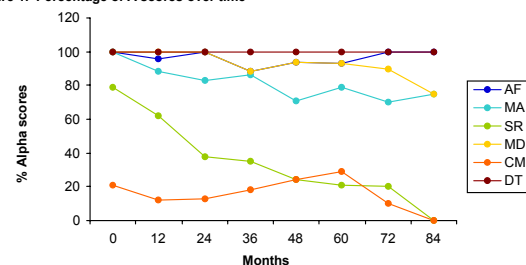
Table 1. Number of A and B scores for each criterion at annual recall

	no. of A scores						
	total	AF	MA	SR	MD	CM	DT
base	33	33	33	26	33	7	33
12m	26	25	23	16	26	3	26
24m	24	24	20	9	24	3	24
36m	17	15	12	6	15	3	16
48m	17	16	12	4	16	4	17
60m	14	13	11	3	13	4	14
72m	10	10	7	2	9	1	10
84m	4	4	3	0	3	0	4

	no. of B scores						
	total	AF	MA	SR	MD	CM	DT
Base	33	0	0	7	0	26	0
12m	26	1	3	10	0	23	0
24m	24	0	4	15	0	21	0
36m	17	1	4	10	1	13	0
48m	17	1	5	13	1	13	0
60m	14	1	3	11	1	10	0
72m	10	0	3	8	1	9	0
84m	4	0	1	4	1	4	0

There were no C and D scores

Figure 1. Percentage of A scores over time



DISCUSSION

There were no scores less than B and so all restorations remain clinically acceptable and in function. The results suggest that these restorations can be expected to perform well. The inlay colour was stable and the colour match was acceptable. There was a slight loss of marginal adaptation due to loss of marginal resin but no loss of ceramic. The restoration contour was maintained without marginal discolouration. There is a slight increase in surface roughness.

The results are in agreement with other longitudinal studies¹ on *Cerana* supporting the use of this technique to reduce the bulk of composite resin in a restoration and significantly reduce the problems associated with polymerisation contraction such as marginal gaps formation². *Cerana* appears to perform well and reduce marginal leakage and discolouration. The results so far support the use of ceramic inserts and techniques aimed at reducing the amount of surrounding composite which tends to wear more rapidly than the ceramic insert itself. Contact areas appear to be maintained in class 2 restorations.

Our general experience with *Cerana* has been that the technique has been quick to learn and simple to use by postgraduate and undergraduate students as well as general practitioners on CPD courses³.



An example of an occlusal cavity in 45 restored with a single *Cerana* inlays at baseline and annual recall.

CONCLUSIONS

In conclusion, the results from this study were promising in terms of aesthetics, patient acceptance, occlusal wear and ease of use.

The use of *Cerana* inlays appears to overcome the problems associated with polymerization contraction of composite resin restorations in addition to providing more stable proximal and occlusal contacts.

REFERENCES

- 1 Cerana – a new method for the restoration of teeth with prefabricated ceramic inlays. Odman P, Nilsson E, Pietruszka K. *Journal of Oral Rehabilitation* 1998 25:340-347
- 2 Marginal adaptation of ceramic inserts after cementation. Ozcan M, Pfeiffer P, Nergiz I. *Operative Dentistry* 2002 27: 132-136
- 3 Cerana – a direct ceramic inlay technique. Millar BJ. *Primary Care* 1999 6: 59-62