

RESEARCH SUMMARY

Study of casts for crown and bridgework

The quality of dental casts used in crown and bridgework

N. Alhourri, F. McCord and P. Smith *Br Dent J* 2004; 197: 261–264

Objective

To assess the quality of dental casts used in crown and bridge construction.

Design

Observational cross-sectional study of dental casts.

Setting

Commercial dental laboratories and a university dental hospital laboratory in the UK.

Materials and methods

A sample (n = 150) of working and opposing casts used for crown and bridgework prescribed by general dental practices and a dental hospital were sampled from two commercial dental laboratories and an 'on-site' university dental hospital laboratory respectively. A simple '3 point' assessment scale of quality (Good, Fair and Poor) was used to categorise the casts depending on the clarity of reproduction of soft and hard tissues.

Results

The quality of opposing casts used for articulation purposes was significantly better ($P < 0.001$) than that of the working casts. In addition it was found that for working casts the quality in the preparation area(s) was significantly better ($p < 0.001$) than that in areas remote from preparation(s) in the same arch. In general, the quality of casts in the incisal or occlusal surfaces was better than the buccal and lingual surfaces.

Conclusions

This study has demonstrated that variation exists in the quality of casts used in crown and bridgework, specifically those used in the construction of indirect restorations and also those used for articulation purposes. This study highlights the need for clinicians to exercise continued vigilance with crown and bridge impressions, and casts, particularly in areas away from the prepared teeth.

IN BRIEF

- There is some need to focus attention not only on prepared teeth but also the remaining teeth in the same arch when making impressions for indirect restorations.
- When using dual phase impressions, clinicians need to be careful when seating the loaded impression tray so as to avoid subsequent inaccuracies in dental casts.
- On the whole clinicians are better at making impressions for study and opposing casts than working crown and bridge impressions.

COMMENT

In this paper, the authors looked at the quality of casts used in crown and bridgework. They used a simple three point scoring system of Good (1), Fair (2), and Poor (3) based on direct observation of a number of randomly selected casts.

Both working casts and opposing casts were used in the study.

One hundred casts produced from impressions made by general dental practitioners were assessed at two commercial laboratories (50 from each), and 50 casts produced in a university dental hospital laboratory from impressions made by undergraduate dental students were also assessed, using the same criteria for all casts.

A number of interesting results were found in the study, which those involved with such work should be aware of:

The authors found no significant difference in quality between those casts prepared from impressions taken by students compared with those from practitioners. However, opposing casts demonstrated better quality where the impressions had been made by students compared with those made by practitioners. Further observations on the opposing casts from both groups were that incisal and occlusal surfaces were of better quality than buccal and lingual surfaces, and that the quality decreased from anterior to posterior regions with the exception of the anterior labial region which demonstrated the poorest quality. Overall, the quality of opposing casts was better than the working casts.

Operator consistency in use of the scoring system was verified by repeat assessments of 17 randomly selected casts one week apart. However, no mention is made of whether just one operator was involved, or whether magnification and standardised lighting and positioning were used.

In the discussion, mention is made of defects in the impressions, although the study was concerned with the resultant casts. Both should really be looked at in this type of investigation and whether this occurred here was not clear. Perhaps the most interesting result was the better quality of the opposing casts compared with the working casts. However, the authors suggest that this may be due to the fact that hydrophobic silicone materials were used for the majority of the latter whereas hydrophilic alginate was used for the former.

R. B. Winstanley, Reader in Restorative Dentistry,
Department of Adult Dental Care, School of Clinical Dentistry,
University of Sheffield
doi:10.1038/sj.bdj.4811619