THE JOURNAL OF PROSTHETIC DENTISTRY

SYSTEMATIC REVIEW

Clinical remounting of complete dentures: A systematic review

Tyler V. Verhaeghe, DDS MEd,[a] Bernie A. Linke, DDS, MSc/Dip Pros, FRCD(C),[b] Cheryl E. Cable, DDS, Dip Pros, MBA, FRCD(C),[c] and Nesrine Mostafa, BDS, MSc, MSc/Dip Pros, PhD, FRCD(C)[d]

ABSTRACT

Statement of problem. A recent trend has been to reduce the procedural complexity of complete denture fabrication. Whether the clinical remount step is necessary is unclear.

Purpose. The purpose of this systematic review was to assess the relevance of the clinical remount procedure on complete denture outcomes.

Material and methods. Five electronic databases were searched through to May 2018. The terms "denture*", "dental prosthes*", "equilibrat*", and "remount*" were chosen. The titles and abstracts were screened, and those which met the inclusion criteria were selected for full-text assessment. Studies that only performed the laboratory remount or were not randomized controlled studies were excluded.

Results. After duplicate removal, the database search strategy resulted in a total of 226 potential studies. After the titles and abstracts had been screened and the inclusion and exclusion criteria applied, 10 studies were retrieved for full-text assessment. Four randomized controlled clinical studies were included in the systematic review. A meta-analysis could not be performed because of variation in outcome measures after the clinical remount.

Conclusions. A clinical remount for complete dentures is recommended on delivery to reduce clinically observed areas of discomfort and reduce the number of recall appointments. The development of a reliable and valid patient satisfaction questionnaire is necessary to determine conclusively whether the clinical remount also improves patient-perceived satisfaction and mastication. (J Prosthet Dent 2019;121:604-10)

Traditionally, 2 complete denture fabrication methods have been described: (1) standard and (2) complex.[1] While both share many similarities, the complex fabrication method further includes hinge axis location, facebow transfer, remounting after processing using new interocclusal records, and the correction of occlusion in eccentric positions. Although justification for a complex approach has been described pragmatically,[2] the scientific evidence for procedural complexity and multiple appointments has been somewhat equivocal.

Nearly 40 years ago, a clinical study in which dentists subjectively evaluated dentures fabricated using the 2 techniques reported no significant difference between them.[3] A recent systematic review suggested that the use of a 2-step impression procedure for complete denture fabrication was not manditory.[4] Another recent systematic review compared the standard and complex fabrication of complete dentures and concluded that there was no difference in masticatory variables, patient satisfaction, or the quality of conventional dentures.[5]

Common errors during either fabrication process which may ultimately lead to an interceptive occlusal contact include inaccuracy of the jaw registrations because of instability of the record base[6] and change in the position of the prosthetic teeth or the intaglio surface during processing,[7-14] as well as incorrect use of the facebow, articulator mounting errors, posterior tooth arrangement malpositioning, or overheating of the processed denture during polishing.[15] In a cross-sectional study of complete dentures mounted in centric relation before occlusal equilibration, the average number of occlusal contacts was 3.4, and approximately one-third had unilateral occlusal contacts only,[16] suggesting that

[a]Graduate student, Prosthodontics, Faculty of Dentistry, University of British Columbia, Vancouver, Canada.
[b]Clinical Professor and Division Head of Restorative Dentistry, School of Dentistry, University of Alberta, Edmonton, Canada.
[c]Associate Professor, School of Dentistry, University of Alberta, Edmonton, Canada.
[d]Assistant Professor, Faculty of Dentistry, University of British Columbia, Vancouver, Canada.

Clinical Implications

Traditionally, the complex fabrication method for complete dentures has included a clinical remount procedure; however, minimizing procedural complexity in the interest of time and cost has been recently emphasized. Performing the clinical remount procedure at the delivery of a complete denture appears to reduce clinically observed areas of discomfort and the number of recalls required after delivery.

an interceptive occlusal contact is frequently present after processing. The consequence is deformation of the supporting soft tissue with displacement of the complete dentures and/or altered neuromuscular adaptation of the mandible which could perpetuate the displaced tissue. Adjustment of a well-fitting denture base to correct the displaced tissue would reduce the fit and further compound the instability of the prostheses.[6]

Once deflasked from processing, complete dentures mounted on an average-value articulator and adjusted in centric and eccentric relations to accommodate for any processing changes is known as a laboratory remount.[17] Alternatively, once the dentures have been processed and polished, they can be inserted into the patient's mouth and the intaglio surface adjusted with the aid of a pressure-indicating medium.[18] This ensures that the supporting soft tissue, which may have been irregularly compressed during the preliminary or custom impressions, has evenly distributed contact with the prostheses. This will also correct for any changes to the intaglio surface of the complete dentures after processing. Remount casts are fabricated, and using either a facebow or a remount index made in the laboratory on the wax denture before processing, the maxillary denture can be mounted on an articulator. The patient is then guided into centric relation and asked to close gently until the first occlusal contact is just made. Attention is paid to where this contact is located. The patient is then guided to close into very soft material to register the maxillomandibular relationship just short of this contact so as not to cause the denture bases to move. The opposing denture can then be mounted on the articulator, and the position of the first occlusal contact made intraorally can be compared to verify that they are virtually identical. If confirmed, the occlusion can thus be equilibrated until bilateral, and even occlusal contacts are achieved. This process is known as the clinical remount.[6,18]

Given the potential for negative sequelae for the patient if the clinical remount is not performed, its effects as a procedure independent of either fabrication methods require appropriate assessment. Therefore, a systematic review was conducted to evaluate the subjective and objective outcomes of the clinically remounted complete denture.

MATERIAL AND METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was followed as much as possible.[19] In November 2017, multiple online databases were systematically searched by independent reviewers to identify clinical trials of clinical remounting of complete dentures. The same search was repeated in May 2018, but the 4 new studies were excluded in the first selection stage, whereby any discrepancies gave rise to a consensus agreement between the 2 reviewers. The search methodology combined the use of keywords and Medical Subject Headings (MeSH) terms using the databases as listed in Table 1. Articles included were not limited by language or date during the initial search. After duplicate articles were removed, an evaluation of all titles was performed in the first selection stage. The abstracts of potentially relevant studies were reviewed using the inclusion and exclusion criteria in the second selection stage. The inclusion criteria were human studies, randomized controlled clinical trial studies including completely edentulous patients treated with complete dentures which compared the use of clinical remounting by evaluating either subjectively or objectively measured outcomes, and English language studies. The exclusion criteria were any studies of lower level evidence than randomized controlled clinical trials and studies that described the laboratory remount rather than the clinical remount. Relevant full-text articles and those for which an abstract was not available were sought and assessed. Finally, the references of the articles chosen were hand searched. The data collected for each selected article included authors, objectives, treatment groups, intaglio surface seating, follow-up, outcomes, and significant results.

RESULTS

The online database search resulted in a total of 735 studies (Fig. 1). After duplicates were removed, 226 studies remained. After the titles in the first selection stage were reviewed, 70 potentially relevant studies remained. Following the second selection stage in which abstracts were reviewed, 10 full-text studies were assessed using the inclusion and exclusion criteria. Full-text assessment included studies for which the title appeared relevant but for which an abstract was not available. Six studies were excluded,[6,17,18,20-22] and the reasons are provided in Table 2. Four studies[23-26] were included in the systematic review. The online database search was followed by a manual search through the references of the included studies, but no additional studies were selected.

Table 1. Search methodology used for each database

Database	Dates of Coverage	Keywords Used
MEDLINE (OvidSP)	1946 to May, 2018	"denture*" OR "dental prosthes*" AND "equilibrat*" OR "remount*"
PubMed (NLM)	1946 to May, 2018	Same search strategy as MEDLINE (OvidSP)
EMBASE (OvidSP)	1974 to May, 2018	Same search strategy as MEDLINE (OvidSP)
Cochrane (Wiley)	To the first quarter of 2018	Same search strategy as MEDLINE (OvidSP)
Scopus (Elsevier)	1960 to May, 2018	Same search strategy as MEDLINE (OvidSP)

Table 2. Exclusion criteria and excluded articles

Literature Reviews	Technical Paper
Rosen, 1984[6]	Nimmo, 1988[21]
Zwetchkenbaum, 2014[18]	Silverman, 1965[22]
Pseudorandomized Control Trial	**Laboratory Remount Only**
Holt, 1977[20]	Sidhaye and Master, 1979[17]

The 4 selected studies were all randomized controlled trials, but a meta-analysis was not performed on the studies because of the variations in study design and measured outcomes (Table 3). In the selected studies, a total of 190 completely edentulous patients were treated with complete dentures. Patient demographics were 48 men and 52 women with an overall average age of 66 years in 1 study[23] and 9 men and 21 women with an age range of 50 to 84 years in another study[26]; demographics were not provided in the other 2 studies.[24,25] Wax was used as the occlusal registration material in 2 studies,[23,24] polyvinyl siloxane in another study,[26] and the choice of material was not mentioned in the remaining study.[25] Articulators were used to perform the clinical remount in all studies, although only 1 study identified that a semiadjustable articulator was used.[26] The study treatments were either the clinical remount only[24,25]; intraoral occlusal corrections and the clinical remount[23]; or intraoral occlusal corrections, the laboratory remount, and the clinical remount.[26] The study treatment outcomes included patient satisfaction questionnaires, transparent photoplastic membranes (which recorded either the number or intensity or force changes or position changes of occlusal contacts), a single examiner intraoral assessment rating scale, and the number of recalls required after delivery.

Al Quran[23] found that the total patient satisfaction score, with a maximum of 36 points, was higher in the clinical remount group (P=.007). Differences were statistically significant in favor of the clinical remount group for general satisfaction, fit of the mandibular denture, mastication ability, and maxillary and mandibular denture comfort. No significant difference was found with regard to appearance, maxillary denture fit, speaking, or comments from others. The author concluded that the clinical remount improved patient satisfaction in many aspects and that the clinical remount should be performed routinely to minimize patient dissatisfaction.

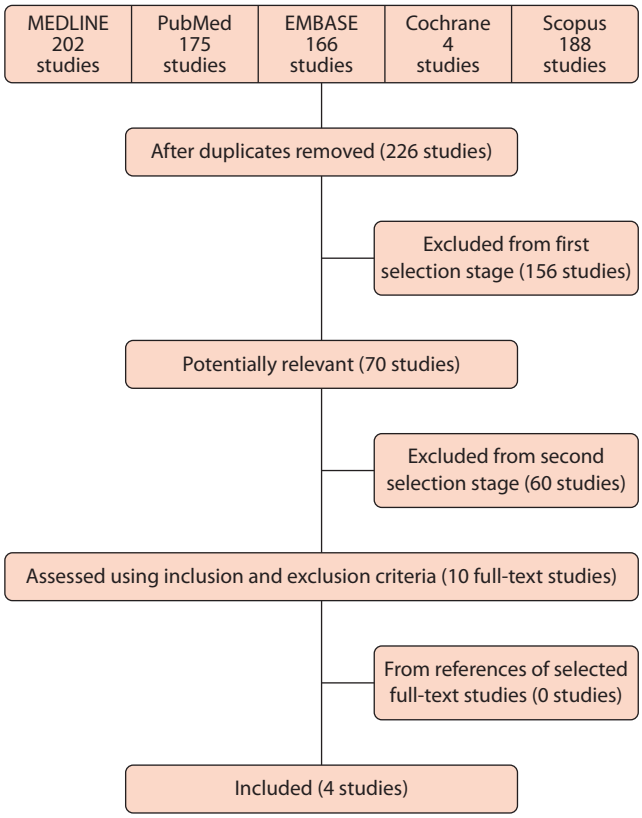

Figure 1. Study selection procedure.

In the study by Polyzois et al,[24] no statistically significant differences were found for the number of occlusal contacts at delivery; however, the clinical remount group showed a larger number of contacts after 1 week (P<.05). At delivery, there was no statistical significance for high- or medium-intensity contacts between the groups, but there was a smaller number of low-intensity contacts for the group with no remount (P<.05). One week after delivery, there was a smaller number of low-intensity contacts in the no remount group than those in the clinical remount group and a smaller number of high-intensity contacts in the laboratory remount group than those in the no remount group (P<.05). The authors concluded that the clinical remount seemed to be beneficial particularly because it had the greatest number of contacts with a more favorable low-intensity distribution, which was even more apparent 1 week after delivery.

In the Firtell et al study,[25] only 1 patient in the clinical remount group reported an area of discomfort compared with 13 in the group without the clinical remount. That same patient in the clinical remount group demonstrated a decrease in force and number of contacts and a change in the position of occlusal contacts. In the group with no

Table 3. Summary of articles included in systematic review

Author(s)	Objective(s)	Treatment Groups: No Clinical Remount	Laboratory Remount	Laboratory and Clinical Remount	Clinical Remount	Intaglio Surface Seating	Follow-up (d)	Outcomes	Significant Results
Al Quran, 2005[23]	Evaluate the use of the clinical remount procedure on patient satisfaction	50 Intraoral occlusal corrections at delivery	N/A	N/A	50 intraoral occlusal corrections at delivery. Remount performed 3-7 d after delivery	PIP applied. Adjusted as needed	Up to 7-14 after delivery	A 4-point scale, 9-category patient denture satisfaction questionnaire administered at second postoperative visit 1 wk after first postoperative visit	Total satisfaction score higher in clinical remount group (31.0 vs. 27.9) P=.007. General satisfaction, fit of mandibular denture, chewing ability, comfort of maxillary, and mandibular dentures all statistically significant for clinical remount group
Polyzois et al, 1991[24]	Evaluate the number and intensity of occlusal contacts using different remounting procedures	10 (Group B)	10 (Group A)	N/A	10 (Group C)	PIP applied. Adjusted as needed	Up to 7 after delivery	Occlusal recordings using transparent photoplastic membranes made at delivery and 1 wk later for all groups	No differences found in number of occlusal contacts between groups at delivery (F=1.951, P=.162). Number of contacts Group C > Groups A or B after 1 wk (P<.05). Low-intensity contacts Group B < Groups A and C at delivery (P<.05). Low-intensity contacts Group C > Group B after 1 wk (P<.05). Group C achieved greater number of contacts with low intensity that was more pronounced 1 wk after delivery
Firtell et al, 1987[25]	Evaluate clinical remount effect on patient comfort after denture insertion and if occlusal changes correlated with patient discomfort	15 (Group 2)	N/A	N/A	15 (Group 1)	PIP applied. Adjusted as needed. Denture was seated with maximum closing force for 10 min on cotton rolls	Up to 7 after delivery	Occlusion (location) and closing force (amount and location) recorded at delivery and 1 wk after delivery using transparent photoplastic membranes. Patients asked about areas of discomfort development after 1 wk	1/15 patients reported areas of discomfort in group 1, whereas 13/15 patients reported areas of discomfort in group 2 after 1 wk. In group 1, 1 patient had decrease in force, decrease in number of contacts, and change in position of contacts. In group 2, 13 patients had decrease in force, 10 had decrease in number of contacts, and 7 had change in position of contacts. Differences were noted for areas of discomfort, change in the number of contacts, and change in the position of contacts (P<.001). Relationship of occlusal changes and areas of discomfort (r=.9)
Shigli et al, 2008[26]	Determine whether refinement of occlusion correlated with patient comfort and the number of postinsertion visits	10 (Group OOC) intraoral occlusal corrections performed	10 (Group LRO) intraoral occlusal corrections also performed	10 (Group LCRO) intraoral occlusal corrections also performed	N/A	PIP applied. Adjusted as needed. Denture seated with maximum closing force for 10 min on cotton rolls. If pain existed with cotton rolls, PIP and adjustments repeated	Up to 7 after delivery and then as necessary	Patients seen at 48 h, 1 wk, and as necessary for third visit. Number of patient visits and patient-perceived comfort of maxillary and mandibular dentures recorded. Tissue irritation identified by intraoral examination. Pain and discomfort graded on 5-point scale by number of quadrants (0-4). TMJ examined on 2-point scale (0-2)	Number of postinsertion visits for LCRO group 1 visit = 10; LRO group 1 visit = 7, 2 visits = 3; OOC group 1 visit = 0, 2 visits = 2, 3 visits = 8 (P<.001). LCRO group less perceived pain during mastication (P=.036) and more perceived comfort during mastication (P<.001). Clinical examination revealed fewer areas of discomfort (P<.001), less pain in quadrant (P=.036), and less discomfort during mastication (P<.001) for LCRO group

N/A, not applicable; PIP, pressure-indicating paste; LCRO, laboratory and clinical remount with occlusal corrections; LRO, laboratory remount with occlusal corrections; OOC, only occlusal corrections; TMJ, temporomandibular joint.

clinical remount, patients generally experienced a decrease in force and the number of contacts and showed a change in the position of occlusal contacts. Analysis of variance showed differences for the number of areas of discomfort and change in the number and position of occlusal contacts ($P<.001$). The relationship between number of areas of discomfort and occlusal changes had a Pearson product moment coefficient of correlation r value of +0.9.

Shigli et al[26] showed that the clinical remount in combination with the laboratory remount and intraoral occlusal corrections reduced the number of recalls required after delivery ($P<.001$). After 1 week, the patient satisfaction survey showed less pain during mastication ($P=.036$) and more comfort during mastication ($P<.001$), and the single examiner–based intraoral findings revealed fewer areas of discomfort ($P<.001$), less pain in the number of quadrants ($P=.036$), and less discomfort during mastication ($P<.001$) in the group receiving the clinical remount combined with the laboratory remount and occlusal correction.

DISCUSSION

A recent systematic review[5] suggested that transitioning from complex to standard fabrication of complete dentures may show no statistically significant difference with regard to masticatory variables, patient satisfaction, or the quality of the prostheses. One of the studies[27] used in that systematic review mentioned that a remount was performed but did not indicate whether this was the laboratory or clinical remount. In its sequence of procedures, it appeared that the remount was performed after delivery of the prostheses. The other 2 studies[28,29] in that systematic review made no mention of performing any form of remount in its complex fabrication methodology. If the clinical remount procedure should be used in the complex fabrication method[1] but appears not to have been done, any conclusions drawn from that systematic review may be difficult to extrapolate. As such, the effects of the clinical remount as a procedure independent of either fabrication method require appropriate assessment. Therefore, subjective and objective methods of evaluating complete dentures after the clinical remount will be discussed.

Although the search for this systematic review resulted in only 4 included studies, they were randomized controlled clinical trials and are therefore defined by the National Health and Medical Research Council (NHMRC) guidelines as level of evidence II.[30] Power analysis to determine an acceptable sample size was performed in the Shigli et al study[26] but was not commented on in the other studies. In terms of the participants chosen for the included studies, there was a low risk of bias with regard to random sequence generation and allocation concealment for all included studies as they all stated that patients were assigned through randomization. As per the exclusion criteria, an article[20] was excluded because it assigned participants using odd-even study numbers and was therefore considered a pseudorandomized control trial.[30] Blinding of participants had an unclear, although most likely low risk of bias, as participants receiving the clinical remount require additional clinical steps compared with no remount. The patient could always inquire online or socially to ascertain which group they belonged to. If more is better, then knowing that they had an extra procedure could skew their input in either direction, particularly in the studies that used subjective patient satisfaction questionnaires as an assessment measure.[23,26] However, to consider these studies as being of low quality would not be appropriate.

Blinding of researchers performing the clinical remounts would not be possible because the researcher would know if they were performing the clinical remount or not. Although this could influence the treatment provided, it would also not be appropriate to consider these studies as of low quality. Blinding of outcome assessors was not mentioned by Al Quran,[23] although the measurement tool was a patient satisfaction questionnaire that would likely have been coded and thus blinded to the person assessing the results. In the 2 studies[24,25] in which wafers were evaluated and compared, the single evaluator was blinded to the treatment. In the Shigli et al[26] study, the participants were clinically examined and evaluated using a rating system by a single evaluator who was blinded with regard to the treatment group each patient had been assigned to. Furthermore, an intraexaminer reliability test was performed on the evaluator and was found to be 0.8. Thus, overall, the risk of bias would be considered low for blinding of assessors. Only Firtell et al[25] had any loss of participants, and these were clearly reported as being small and relatively balanced between both the groups. The researchers contacted the patients to document whether they had any areas of discomfort.

With regard to study designs, all studies in this systematic review used a pressure-indicating medium on the intaglio surfaces of the prostheses to ensure that they were completely seated before the clinical remount, as recommended in the literature.[6,18] The study design made it difficult to quantify the effect that occluding on cotton rolls[25,26] may have had on ensuring that the intaglio surface, with pressure-indicating medium, seated into the soft tissue. Although Al Quran[23] performed the clinical remount 3 to 7 days after delivery of the prostheses, which contradicts the conventional timing for the clinical remount to be performed at the delivery appointment,[6,18] an attempt to reduce interceptive occlusal contacts at the time of delivery was performed; the clinical remount was still completed before the

patient answered the patient satisfaction questionnaire. Shigli et al[26] did not examine a group with only a clinical remount because the clinical remount group used in their study was combined with the laboratory remount and intraoral occlusal corrections. If the clinical remount is performed as described in the introduction, it should be done independently of the laboratory remount, not as an adjunct. Similarly, the use of intraoral occlusal corrections should be minimal to none. The follow-up time for all studies was appropriate for evaluating the outcomes measured.

With regard to patient satisfaction questionnaires, Al Quran[23] used one that had been previously used,[31] whereas Shigli et al[26] developed their own 5-question closed-ended questionnaire and tested it in a pilot study. The questionnaire used by Al Quran had previously found[31] that the overall patient satisfaction score correlated best with overall satisfaction of the dentures, masticatory ability, and comfort of the mandibular denture. However, general satisfaction, mastication ability, and comfort of the mandibular denture were all statistically significant for the clinical remount group in Al Quran's study,[23] although this was also true for the fit of the mandibular denture and comfort of the maxillary denture. Nevertheless, the validity and reliability of both questionnaires were not described and therefore require further investigation.

In terms of subjective outcome assessment where a patient satisfaction questionnaire was used, statistically significant differences in the outcomes of general satisfaction,[23] fit of the mandibular denture,[23] comfort of the maxillary and mandibular dentures,[23] and an overall effect on mastication in terms of ability,[23] less pain,[26] and more comfort[26] were found to favor the clinical remount groups. In terms of objective outcome assessment where clinical examination or visits occurred, the use of the clinical remount resulted in a statistically significant difference in terms of fewer areas of discomfort,[25,26] fewer quadrants with pain,[26] reduced discomfort during mastication,[26] and fewer postinsertion visits.[26] When transparent photoplastic membranes were used for objective outcome assessment, increased contacts[24,25] of low-intensity quality[24] which were more pronounced 1 week after delivery were noted[24] in favor of the clinical remount. Furthermore, changes in occlusion position when no clinical remount was performed and a large magnitude of effect size (r=0.9) for the relationship between occlusal position changes and areas of discomfort[25] support the effect of interceptive occlusal contact on the movement of the denture base and its detriment to the soft tissue.

These findings suggest that the clinical remount should be considered before delivering a complete denture. They also suggest that recommendations to adopt more simplified fabrication methods in the interest of time and cost should consider retaining the clinical remount procedure from the complex fabrication method and use it for both fabrications. Where time and cost are of concern, several technical papers have been published which describe simplified methods for performing the clinical remount.[32-34] Even so, given the limited number of randomized controlled trials in this systematic review, the current evidence suggests that more studies should be carried out. Particular consideration should be given to power analysis, objective measures of outcomes, and standardization of study design to permit the possibility of a meta-analysis.

CONCLUSIONS

Within the limitations of this systematic review, the following conclusions were drawn:

1. The clinical studies included in this systematic review suggest that the clinical remount be performed at the delivery of a complete denture, preceded by the use of a pressure-indicating medium to ensure a well-fitting intaglio surface.
2. The clinical remount can help correct both processing changes and errors made during the complete denture fabrication process and appears to reduce the number of clinically observed areas of discomfort and the number of recalls required after delivery.

REFERENCES

1. Hickey JC, Henderson D, Straus R. Patient response to variations in denture technique. I. Design of a study. J Prosthet Dent 1969;22:158-70.
2. Hickey J, Boucher C, Woelfel J. Responsibility of the dentist in complete dentures. J Prosthet Dent 1962;12:637-53.
3. Ellinger CW, Somes GW, Nicol BR, Unger JW, Wesley RC. Patient response to variations in denture technique. Part III: five-year subjective evaluation. J Prosthet Dent 1979;42:127-30.
4. Regis R, Alves C, Rocha S, Negreiros W, Freitas-Pontes K. The importance of a two-step impression procedure for complete denture fabrication: a systematic review of the literature. J Oral Rehabil 2016;43:771-7.
5. Paulino MR, Alves LR, Gurgel BC, Calderon PS. Simplified versus traditional techniques for complete denture fabrication: a systematic review. J Prosthet Dent 2015;113:12-6.
6. Rosen J. Clinical remount: a time saving, practice building idea for complete denture construction. J Phila Cty Dent Soc 1984;49:9.
7. Perlowski SA. Investment changes during flasking as a factor of complete denture malocclusion. J Prosthet Dent 1953;3:497-9.
8. Peyton FA, Anthony DH. Evaluation of dentures processed by different techniques. J Prosthet Dent 1963;13:269-82.
9. Wesley RC, Henderson D, Frazier QZ, Rayson JH, Ellinger CW, Lutes MR, et al. Processing changes in complete dentures: posterior tooth contacts and pin opening. J Prosthet Dent 1973;29:46-54.
10. McCartney JW. Flange adaptation discrepancy, palatal base distortion, and induced malocclusion caused by processing acrylic resin maxillary complete dentures. J Prosthet Dent 1984;52:545-53.
11. Sykora O, Sutow EJ. Comparison of the dimensional stability of two waxes and two acrylic resin processing techniques in the production of complete dentures. J Oral Rehabil 1990;17:219-27.
12. MolligodaAbuzar MA, Jamani K, Abuzar M. Tooth movement during processing of complete dentures and its relation to palatal form. J Prosthet Dent 1995;73:445-9.
13. Shibayama R, Gennari Filho H, Mazaro JVQ, Vedovatto E, Assunção WG. Effect of flasking and polymerization techniques on tooth movement in complete denture processing. J Prosthodont 2009;18:259-64.
14. Sotto-Maior BS, Jóia FA, Meloto CB, Del Bel Cury AA, Rizzatti-Barbosa CM. Effect of double flasking and investing methods on artificial teeth movement in complete dentures processing: inclusion methods on artificial teeth positioning. Gerodontology 2012;29:e435-9.

15. Badel T, Ćelić R, Kraljević S, Pandurić J, Dulčić N. Complete denture remounting. Acta Stomat Croat 2001;35:381-7.
16. Atashrazm P, Dashti MH. The prevalence of occlusal disharmony and its associated causes in complete dentures. J Contemp Dent Pract 2009;10:e041-8.
17. Sidhaye AB, Master SB. Efficacy of remount procedures using masticatory performance tests. J Prosthet Dent 1979;41:129-33.
18. Zwetchkenbaum S. Clinical remount and occlusal equilibration. J NJ Dent Assoc 2014;85:24-5.
19. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JPA, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. BMJ 2009;339:b2700.
20. Holt JE. Research on remounting procedures. J Prosthet Dent 1977;38:338-41.
21. Nimmo A. Clinical remount for complete dentures. Quintessence Int 1988;19:273-7.
22. Silverman MM. Preventing problem complete denture cases by balancing and equilibrating occlusion. J Dist Columbia Dent Soc 1965;40:100-1. passim.
23. Al Quran FAM. A clinical evaluation of the clinical remount procedure. J Contemp Dent Pract 2005;6:048-55.
24. Polyzois GL, Karkazis HC, Zissis AJ. Remounting procedures for complete dentures: a study of occlusal contacts by the photocclusion technique. Quintessence Int 1991;22:811-5.
25. Firtell DN, Finzen FC, Holmes JB. The effect of clinical remount procedures on the comfort and success of complete dentures. J Prosthet Dent 1987;57:53-7.
26. Shigli K, Angadi GS, Hegde P. The effect of remount procedures on patient comfort for complete denture treatment. J Prosthet Dent 2008;99:66-72.
27. Kawai Y, Murakami H, Shariati B, Klemetti E, Blomfield J, Feine J, et al. Do traditional techniques produce better conventional complete dentures than simplified techniques? J Dent 2005;33:659-68.
28. Cunha TR, Della Vecchia MP, Regis RR, Ribeiro AB, Muglia VA, Mestriner W Jr, et al. A randomised trial on simplified and conventional methods for complete denture fabrication: masticatory performance and ability. J Dent 2013;41:133-42.
29. Heydecke G, Vogeler M, Wolkewitz M, Türp JC, Strub JR. Simplified versus comprehensive fabrication of complete dentures: patient ratings of denture satisfaction from a randomized crossover trial. Quintessence Int 2008;39:107-16.
30. Australian Government, NHMRC. How to use the evidence: assessment and application of scientific evidence. Available at: http://nhmrc.gov.au/_files_nhmrc/file/publications/synopses/cp69.pdf. Accessed December 10, 2017.
31. Guckes AD, Smith DE, Swoope CC. Counseling and related factors influencing satisfaction with dentures. J Prosthet Dent 1978;39:259-67.
32. Wagner AG. Remounting complete dentures without using plaster of Paris. J Prosthet Dent 1970;24:209-12.
33. Khan Z, Morris JC. Remount casts for occlusal correction. J Prosthet Dent 1983;49:445.
34. Oh W, Saglik B. Remount cast fabrication for occlusal equilibration against artificial denture teeth. J Prosthet Dent 2009;101:350-1.

Corresponding author:
Dr Tyler V. Verhaeghe
Faculty of Dentistry
University of British Columbia
2151 Wesbrook Mall
Vancouver, British Columbia V6T 1Z3
CANADA
Email: tyler.verhaeghe@alumni.ubc.ca

Acknowledgments
The authors thank Dr Doris Lunardon, Dr Sheila Passos, Dr Han-Kuang Tan, and Dr Mark Wright for their contributions.

https://doi.org/10.1016/j.prosdent.2018.06.017

Noteworthy Abstracts of the Current Literature

Association between early implant failure and prosthodontic characteristics

Carr AB, Sinha N, Lohse CM, Muller OM, Salinas TJ

J Prosthodont 2019;28:30-5

Purpose. To identify associations between early implant failure and prosthodontic characteristics that could be used to guide subsequent continuous quality improvement efforts of patient care.

Material and methods. An implant-level analysis was performed in which data were abstracted from a prospective clinical database of all adult patients treated with implants and followed up from January 2000 through December 2014 at the Department of Dental Specialties at Mayo Clinic in Rochester, Minnesota. These data were used to determine time to implant failure. Associations between prosthodontic characteristics and early implant failure were evaluated with Cox proportional hazards regression models and summarized with hazard ratios (HRs) and 95% confidence intervals (CIs).

Results. Among 8762 implants in 2787 patients, 395 (4.5%) failed within the first year of placement at a mean (SD) of 127 (97) days (range, 2-364 days). Univariable analysis showed no associations between early implant failure and use of a cover screw, prosthesis, or definitive or provisional prosthesis at implant placement. Three of 25 single crowns failed, and use of a single crown was significantly associated with early implant failure (HR, 3.94; 95% CI, 1.08-14.35; P= 0.04). This study identified no significant associations between prosthodontic characteristics identified after implant placement and early implant failure.

Conclusions. Use of a prosthesis at implant placement, use of a definitive or provisional prosthesis, and early mechanical complications were not associated with increased risk of early implant failure. Quality improvement efforts should focus on aspects of decision making that aim to decrease surgical complications.

Reprinted with permission of The American College of Prosthodontists.