A review of functional outcomes related to prosthetic treatment after maxillary and mandibular reconstruction in patients with head and neck cancer

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**CRD summary**
This review was unable to draw comparative conclusions between techniques for micro-vascular reconstruction of the osseous structures of the oral cavity in patients with head and neck cancer. Given the study heterogeneity and paucity of good-quality evidence, the authors’ conservative conclusion appears appropriate. However, the potential for missed studies and error and bias within the review are unclear.

**Authors' objectives**
To assess the functional outcomes of patients with head and neck cancer following micro-vascular reconstruction of the osseous structures of the oral cavity.

**Searching**
MEDLINE, EMBASE, CINAHL, Cochrane Database of Systematic Reviews, ACP Journal Club and DARE were searched for English-language studies from 1990 to 2006; search terms were reported. Reference lists of relevant articles were searched manually to identify additional articles.

**Study selection**
Studies that reported outcomes for speech, swallowing, mastication or quality of life following microvascular reconstruction of the maxilla and/or mandible in patients with head and neck cancer were eligible for inclusion. Studies reporting outcomes of implant survival rates were excluded as were those where: reconstruction of the soft tissues of the oral cavity were the main study focus; defects and sites of reconstruction were unclear; resection of soft tissues and osseous structures were grouped; results were not presented separately for osseous resection and type of prosthesis; and where a wider population or several interventions were investigated but the results were not reported separately.

Lesion locations comprised the: maxilla; mandible; oropharynx; oral cavity; or less common sites such as the lips or buccal mucosa. Interventions included maxillary and mandibular reconstruction with or without prosthetic treatment. Where prostheses were used these included fixed, overdenture, partial or complete maxillary denture or partial or complete mandibular denture. From the studies reporting participants age, the overall mean was 55.5 years (range three to 88 years); 71 per cent of patients were male.

A single reviewer evaluated titles, abstracts and full papers for inclusion. Selected papers were assessed for inclusion by a second reviewer. Both reviewers undertook an additional tertiary review of the included studies.

**Assessment of study quality**
The authors stated that information relating to internal and external validity were extracted; only the numbers of studies classified by levels of evidence were presented.

**Data extraction**
A wide range of outcomes were reported across studies. Results obtained from intelligibility, speech and chewing scores, questionnaires, surveys and food tests were extracted. Some studies reported oral excursion, occlusal force, masticatory force and cosmetic outcomes.

The authors did not state how many reviewers performed the data extraction.

**Methods of synthesis**
A narrative synthesis was provided, supported by tables and with differences between studies discussed in the text. The studies were grouped by type of reconstruction and prosthetic treatment.
Results of the review
A total of 49 studies were included in the review (n=1 to 116). Duration of follow-up, where specified, ranged from three weeks to 11 years.

Maxillary reconstruction: Conventional prosthetic treatment (three studies) yielded satisfactory speech outcomes. Single studies reported a return to an unrestricted oral diet, mastication possible but below the normal level of functioning and high quality of life scores. For those who received implant-retained prosthetic treatment (six studies) satisfactory speech outcomes were reported across all studies together with improved mastication and quality of life. Where no prosthetic treatment was received (one study), speech was reported to be normal and excellent quality of life was reported in most patients.

Mandibular reconstruction: For those who received conventional prosthetic treatment (seven studies), speech was generally found to be satisfactory following surgery, a regular diet could be tolerated by patients with no swallowing difficulties and mastication was possible, but below normal levels of functioning and satisfactory quality of life outcomes were reported. Following implant-retained prosthetic treatment (16 studies), intelligible or normal speech were frequently reported, most patients were able to tolerate a normal diet, masticatory performance was improved and quality of life (in terms of cosmetic appearance and aesthetics) was improved for most patients. Where no prosthetic treatment was received (six studies), positive speech outcomes prevailed, there was postoperative tolerance of a soft or normal diet, masticatory outcomes varied between studies and for quality of life most patients reported satisfactory cosmetic appearance and better physical well-being and socio-familial relationships, and general functional well-being.

Authors’ conclusions
Comparative conclusions regarding prosthetic treatments were not possible.

CRD commentary
The review question and inclusion criteria were clear. The search strategy was thorough, but was restricted to publications in English, so publication and language bias may have been present. The selection of studies for the review was undertaken by one reviewer, with the rest of the process partly undertaken in duplicate; therefore, no methods were used to reduce error and bias for study selection. It was not stated how the data extraction was undertaken. Study quality was reportedly assessed, but this was not reported within the review. Most included studies were small and contained less than 20 participants. A narrative synthesis was appropriate with the clinical heterogeneity across studies. Given the study heterogeneity, paucity of experimental studies and small sample sizes, the authors’ conservative conclusion appears appropriate. However, the potential for missed studies, error and bias is unclear.

Implications of the review for practice and research
Practice: The authors did not state implications for practice.

Research: The authors stated that specifics on assessment protocol should be addressed in future studies. Future research could focus upon whether rehabilitation with a conventional tissue/tooth-supported prosthesis after reconstruction with soft tissue was comparable to rehabilitation with an implant-retained prosthesis after reconstruction with an osseous flap. Additionally, appropriate measures of function should be standardised so that comparisons across institutions can be readily achieved.

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