Radiofrequency ablation treatment of soft palate for patients with snoring: a systematic review of effectiveness and adverse effects

Back LJ, Hytonen ML, Roine RP, Malmivaara AO

CRD summary
This review assessed the effectiveness and adverse effects of radiofrequency ablation of the soft palate in the treatment of snoring and concluded that it might reduce the symptoms of snoring at short-term follow-up, with only minor discomfort and a small risk of adverse effects. The review was generally well conducted and the authors’ cautious conclusions are likely to be reliable.

Authors’ objectives
To assess the effectiveness and adverse effects of radiofrequency ablation of the soft palate in the treatment of snoring.

Searching
MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), and Current Controlled Trials were searched for published studies, without language restriction, up to April 2008. Search terms were reported.

Study selection
Controlled or prospective studies that evaluated radiofrequency ablation of the soft palate, in at least 10 patients, who snored and were at least 18 years old and who did not have moderate or severe obstructive sleep apnoea, as defined by recognised criteria, were eligible for inclusion. The efficacy outcomes reported in the review included the reduction in the symptoms of snoring, daytime sleepiness, and changes in the upper airways. The safety outcomes included voice quality and postoperative pain.

The included studies evaluated the following radiofrequency ablation devices: Somnus, Coblator, Surgitron, Celon, Select Sutter, and VidaMed. The number of ablations and treatment sessions varied between studies. Most of the included studies were prospective and uncontrolled. The control arm in the randomised controlled trials (RCTs) was placebo or an alternative radiofrequency generator. Most of the studies excluded patients with a body mass index above 30 to 35. The included studies were published between 1998 and 2008.

Two reviewers independently assessed studies for inclusion, with any disagreements resolved by consensus.

Assessment of study quality
The quality of the controlled studies was assessed using van Tulder criteria, which assess randomisation, allocation concealment, baseline similarity, blinding, cointerventions, compliance to the interventions, loss to follow-up, timing of outcome assessment, and intention-to-treatment analysis, on an 11-point scale. The quality of uncontrolled studies was assessed using Borghouts criteria, which evaluate the selection of the study population, inclusion and exclusion criteria, prognostic factors, sample size, follow-up duration, loss to follow-up, outcome measures, and presentation and analysis of the results, on a 10-point scale.

Two reviewers independently performed the validity assessment, with any disagreement resolved by consensus.

Data extraction
Means and standard deviations were extracted. The data extraction was performed by one reviewer and checked by another reviewer, with any disagreement resolved by consensus.

Methods of synthesis
The studies were combined in a narrative synthesis and grouped by different outcome measures.

Results of the review
Thirty studies (two RCTs, four controlled clinical trials, and 24 prospective uncontrolled studies) were included. The total number of patients was not reported; where reported, the sample size ranged from 10 to 120. The median quality score of controlled trials was six (ranging from five to seven) and the median quality score of uncontrolled trials was five (ranging from two to seven). Where reported, the follow-up duration ranged from four weeks to 30 months.

**Snoring:** One RCT reported that radiofrequency ablation significantly reduced snoring reported by the bed partner, using the visual analogue scale, compared with placebo (p=0.045). One RCT reported that all of four radiofrequency ablation generators significantly reduced the snoring intensity reported by the bed partner on the visual analogue scale (p<0.0001); there were no significant differences in treatment efficacy between the generators. One controlled clinical trial reported that radiofrequency ablation was significantly better in reducing snoring than injection snoreplasty (p=0.031). All 18 uncontrolled prospective studies that reported snoring outcomes showed that radiofrequency ablation significantly reduced snoring scores, when assessed by the patient (nine studies), the bed partner (11 studies), or both (two studies).

**Surgically induced morbidity:** Two controlled studies reported that radiofrequency ablation was associated with a significant reduction in the number of days with pain that required medication, compared with laser-assisted uvulopalatoplasty or uvulopalatopharyngoplasty. One RCT reported that the Somnus generator induced more prolonged pain than other generators (Coblator, Select Sutter, and Surgitron). Two studies reported no significant difference in voice quality between preoperative and postoperative measures. No major adverse events or long-term side-effects were reported.

The results for daytime sleepiness, upper airways, and relapse were also reported.

**Authors' conclusions**
Radiofrequency ablation of the soft palate reduced the symptoms of snoring at short-term follow-up and caused only minor discomfort, with a small risk of adverse effects.

**CRD commentary**
The inclusion criteria were clear and relevant sources were searched. Efforts were made to find published studies, but not unpublished ones, which introduced the potential for publication bias. No language restriction was applied, which minimised the risk of language bias. Sufficient attempts were made to minimise the errors and biases in the review process and relevant criteria were used to examine study quality. The details were reported for some of the primary studies, but for uncontrolled studies only statistically significant changes were reported, with no further results. Given the diversity of the included studies, a narrative synthesis was appropriate.

The review was generally well conducted and the authors' cautious conclusions reflect the evidence presented and are likely to be reliable.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further well-designed, double-blind RCTs were required to compare different devices of radiofrequency ablation in the treatment of snoring for both subjective and objective outcomes.

**Funding**
Finnish Office for Health Technology Assessment.

**Bibliographic details**

**PubMedID**
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.