SURGICAL VERSUS NON-SURGICAL INTERVENTIONS FOR VOCAL CORD NODULES

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ABSTRACT

Background
Vocal cord nodules are bilateral swellings of the mid-portion of the membranous vocal folds. They are of variable size and are characterised histologically by thickening of the epithelium with a variable degree of inflammatory action in the underlying superficial lamina propria. They characteristically produce hoarseness. Treatment of vocal cord nodules aims to eliminate or reduce this hoarseness.

Objectives
To assess the effectiveness of surgery versus non-surgical interventions for vocal cord nodules.

Search Strategy
We searched the Cochrane Controlled Trials Register (CCTR) and Medline (1966-2000), Embase (1974-2000), Biological Abstracts (1970-2000), Biological Abstracts RRM (Reports, Reviews and Meetings) on CD-ROM (1989-2000) and review articles.

Selection Criteria
Randomised and quasi-randomised trials comparing any surgical intervention for vocal cord nodules with non-surgical treatment or no treatment.

Data collection and analysis
No suitable trials were identified.

Main Results
No studies fulfilled the inclusion criteria.

Reviewers' conclusions
There is a need for high quality randomised controlled trials to evaluate the effectiveness of surgical and non-surgical treatment of vocal cord nodules.

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Pedersen M, McGlashan J Surgical versus non-surgical interventions for vocal cord nodules (Cochrane Review). In: *The Cochrane Library*, Issue 1, 2004. Chichester, UK: John Wiley & Sons, Ltd.

BACKGROUND

DEFINITION
Vocal cord nodules are bilateral swellings of variable size found at the mid-part of the membranous vocal cords. They are characterised mainly by thickening of the epithelium with a variable degree of inflammatory reaction in the underlying superficial lamina propria (Nagata 1983).

SYMPTOMS, PREVALENCE AND AETIOLOGY

Vocal nodules cause hoarseness, throat discomfort or pain which varies with the amount of voice use. This results in an unstable and unpredictable voice, which can affect the quality of life, particularly in professional voice users such as singers (Lacina 1972). The prevalence of nodules in the general population is not known but it has been reported as being the cause of hoarseness in up to 23.4% of children (Silverman 1975), 0.5-1.3% of ENT clinic attendances (Böhme 1969; Nagata 1983) and 6% of phoniatric clinic attendances. The prevalence of nodules in female teachers was found by Urrutikoetxea to be 43% of 218 cases with dysphonia, in a population of female 1046 teachers in their study in Spain (Urrutikoetxea 1995). Teachers are speaking for an average of 102 minutes per 8 hours (Masuda 1993). Nodules were found in 25% of hoarse singers (Lacina 1972).

The aetiology of vocal nodules is not known, but traditionally they are thought to be due to 'voice abuse' and psychological factors, especially in children. Other medical conditions, such as infection, allergy and reflux, may also play a role in the aetiology (Hugh-Munier 1997). In a study of 20 adult females, Yamaguchi considered voice abuse to be the cause of vocal nodules (Yamaguchi 1986). The abuse was characterised by strain in the neck and shoulder region, hard glottal attack, loud voice in the chest register and singing above one's own range. The definitions of vocal abuse however are subjective, although attempts to define objective deviations have been made (Xu 1991; Pedersen 1997). The impact stress of phonation appears to be important both clinically and in laboratory models of vocal cord nodules (Jiang 1994). In boys it is recognised that nodules resolve spontaneously at puberty (Seidner 1982; Håkansson 1984).

DIAGNOSIS

The accepted technique for the diagnosis of nodules is endoscopic laryngeal examination (allowing visualisation of the vocal cords during phonation and respiration). Examination with a stroboscope gives additional information about the vibratory and closure patterns of the vocal cords and helps exclude other vocal cord pathology, for example intracordal cysts. Stroboscopy is considered a necessary preoperative examination technique in adults, and in children it is also extremely desirable but not always possible. Acoustic and aerodynamic criteria alone cannot be used for diagnosis, although improvements in certain parameters towards normal values can be taken as a sign of response to intervention (Remacle 1999). As many patients will not have had surgery, a clinical diagnosis may not have been confirmed by histological examination.

MANAGEMENT OPTIONS

There is considerable controversy over the role of surgery in the management of vocal cord nodules. Historically, nodules were excised, but with better understanding of vocal function, more conservative non-surgical techniques have been developed and are now considered by many the primary treatment of choice. Rates of surgical intervention vary widely and the exact criteria for surgery are not clearly defined.

The options for the treatment of nodules are speech therapy techniques and surgery. Recently, medical/pharmacological interventions have been focussed upon, such as treatments of exacerbating factors, for example infection, allergy and reflux, when present (Hocevar 1997; Kuhn 1998). Schlömicher-Thier, an ENT specialist treating Salzburg Festival singers, emphasises the importance of pre-nodal conditions, including taking a careful history and diagnosis by stroboscopy. He recommends strict voice rest, and advocates helping people analyse their own voices, to prevent further damage (personal communication, 1999). Non-surgical treatments are administered by speech and language therapists and are based on behaviour modification (McFarlane 1990; Murry 1992). They include vocal hygiene measures (Verdolini 1994), 'abuse' reduction and vocal retraining (Fex 1994). Occasionally, no intervention is indicated and observation alone is recommended (Nagata 1983), either because the symptoms are not severe enough or because there is a strong expectation of spontaneous improvement. Otorhinolaryngologists and phoniatricians are involved in the diagnosis, the treatment of concomitant medical conditions and the surgical management of the patient. Surgical removal of nodules includes excision with microsurgical instruments (Wendler 1971; Bouchayer 1988; Cornut 1989; Kleinsasser 1991) and the laser (Keilmann 1997; Remacle 1999).

OBJECTIVES

To assess the effectiveness of surgical versus non-surgical treatment in the management of vocal cord nodules. The planned outcome measures of the intervention included overall assessment of voice function (impairment, disability and handicap) (WHO 1998), quality of life (Jacobsen 1997), and objective assessment of the vocal cords and of voice quality (by visual assessment by endoscopy, perceptional scoring of voice quality, individual aerodynamic and acoustic measurement (Hillman 1990; Remacle 1999), fundamental frequency and respiratory values).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

All randomised or quasi-randomised controlled comparisons. Controlled clinical trials (trials using a control group but no adequate randomisation procedure) and quasi-randomised trials were sought for the review, no randomised controlled trials considering the treatments of interest having been found.

Types of participants

Children and adults with visually confirmed vocal cord nodules. We planned to include studies where the clinical diagnosis had been reached by examination of the vocal cords by indirect laryngoscopy, rigid or fibre-optic endoscopy or micro-laryngoscopy. Stroboscopy was not considered mandatory.

Types of intervention

Treatment which was non-surgical or surgical.

Non-surgical measures included one or more of the following:

1. Medical/pharmacological treatment of infections, allergy, and laryngopharyngeal acid reflux
2. Vocal hygiene advice (including alterations in working environment)
3. Reduction of 'voice abuse'
4. Voice re-training
5. Voice rest
6. Observation alone

Surgical treatment was removal of the nodules by:

1. Direct microsurgical techniques
2. Indirect microsurgical techniques
3. Laser excision
4. Laser ablation

Types of outcome measures

The primary outcome measures of interest were:

1. Perceptual scoring of voice quality (both by the patient and the investigator)
2. Quality of life, for example, return to singing career or other vocally demanding profession

We were also interested in:

1. Assessment of conditions associated with nodules (see under non-surgical types of interventions)
2. Objective assessment of the vocal cords and of vocal function in individuals with nodules:

--a. Visual appearance of the vocal cords
--b. Scoring of roughness, breathiness and overall hoarseness of the voice with perceptual measures
--c. Acoustic measures of continuous speech or sustained vowels and phonetograms
--d. Fundamental frequency with jitter and shimmer
--e. Aerodynamic measurements

Desirable time points of outcome assessment were: short-term, 1 month; medium-term, 6 months; long-term, 1-5 years.

SEARCH STRATEGY FOR IDENTIFICATION OF STUDIES

See: Cochrane Ear, Nose and Throat Disorders Group search strategy

An initial search was made using the Cochrane Library. Additional studies were searched for using Medline (1966-2000), Embase (1974-2000), Biological Abstracts (1970-2000), Biological Abstracts RRM (Reports, Reviews and Meetings) on CD-ROM (1989-2000) and review articles. The following search strategy was used:

1. ((VOCAL CORD) OR (VOCAL FOLD) OR LARYNG*) AND NODULE*
2. (VOCAL CORD NEOPLASM*) AND BENIGN
3. NODULE*
4. VOICE-DISORDERS*:ME [MeSH term, include all subheadings)
5. #1 OR #2 OR #3 OR #4

For identification of randomised controlled trials on Medline and Embase, these terms were combined with the highly sensitive search strategy developed by the Cochrane Collaboration for identification of controlled clinical trials. The search was carried out by the two reviewers independently. Handsearching was necessary for the literature before 1966, referred to in older articles. Reference lists of identified publications were scanned for additional trials and authors contacted as necessary. In addition, the reference lists of any previous reviews of the subject and the reviewer's own files were scanned for relevant studies. The PEVOC III conference 1999 and the XXIrd conference of the Union of European Phoniatricians 1999 were attended, but no further references were obtained. Leading researchers agreed that they had not been able to afford prospective randomised studies, as voice research is not a priority for foundations and governments. Possible additional search terms were discussed at two conferences where the subject was presented. The full text articles of the retrieved trials were then reviewed by two reviewers and the inclusion criteria applied independently. Any differences in opinion about which studies to include in the review were resolved by discussion between the two reviewers.

METHODS OF THE REVIEW

No suitable trials were identified for inclusion in this review. Should such trials become available the following methods will be applied:

DATA EXTRACTION
Data from the studies will be independently extracted by the two reviewers using standardised data forms. Data will be extracted so as to allow an intention to treat analysis. After all the data forms are filled in, all first authors of the trials to be included and possibly included will receive a copy for comments. Where data are missing, the reviewers will write to the authors of the study requesting the missing data.

QUALITY ASSESSMENT
The quality of all trials will be assessed independently by the two reviewers. Differences will be resolved by discussion. A modification of the method by Schulz et al is planned (Schulz 1995).

The selected studies will be assessed for the following characteristics:

1. the adequacy of the randomisation process and of allocation (A: adequate, B: uncertain, C: not adequate)
2. the potential for selection bias after allocation to study group, i.e. losses to follow-up and whether analysis was by intention to treat
3. whether there was blinding of outcome assessors to the participants' study group
4. quality of the outcome assessment (A: adequate)

Studies will be graded A, B or C for their overall methodological quality:

A: minimisation of bias in all four categories above, i.e. adequate randomisation; few losses to follow-up and intention to treat analysis; blinding of outcome assessors; high quality outcome assessment
B: each of the criteria in A partially met
C: one or more of the criteria in A not met

DATA ANALYSIS

Data will be by intention to treat. If data are of sufficient quality (categories A and B) they will be combined to give a summary of effect, otherwise data will not be combined. Study quality will be used in a sensitivity analysis. If the data permit, analysis will be carried out separately for different types of voice treatment, as well as considering surgical versus non-surgical treatment of nodules as a whole.

Study outcomes are likely to be measured in a variety of ways using several categorical variables. Data may be dichotomised if appropriate. Statistical advice will be sought to determine the best way of presenting and summarising the data.

DESCRIPTION OF STUDIES

A total of 659 studies were identified through electronic searching. Handsearching of more than 250 pre-1966 papers was carried out. No randomised controlled trials were identified by the search and therefore data collection and synthesis was not performed. The studies which were selected for evaluation were the only ones with systematically given diagnoses and treatment (see 'Characteristics of Excluded Studies'). Of these studies 18 were retrospective, two were prospective. All were without control groups. In all studies the number of patients and effect rate ("good subjective voice quality") was given. However, recurrence rate was only discussed in 11 studies and the observation time referred to in only 6 studies. The objective measurements were not usable for meta-analysis for the reasons given above but also due to lack of comparability and consistency.

Most studies focused on aetiology, symptoms, diagnosis, treatment or prognosis. The 20 evaluated studies had methodological structures which in part included diagnosis, treatment, recurrence and follow-up, but were all without control groups and nearly all retrospective. All of these studies were therefore excluded. There was no disagreement between the reviewers on the final exclusion of studies.

METHODOLOGICAL QUALITY

Not applicable.

RESULTS

No studies were found which satisfied the inclusion criteria for this review. The studies which were considered during the review are discussed in the section 'Characteristics of Excluded Studies' below, and their outcome data is shown in Table 01.

DISCUSSION

A comprehensive search strategy was used for the review. Every effort was made to identify relevant studies including two chairmanships at conferences in 1999. In addition, leading researchers were approached to identify further trials and unpublished work on the treatment of vocal nodules.

No studies were excluded due to language. While several attempts were made to identify unpublished works, it is still possible that some studies will have been missed. However, the absence of eligible studies for review was not due to restricted selection criteria, but rather due to the absence of identified randomised controlled trials evaluating surgery versus non-surgical treatment for vocal cord nodules.

A large number of studies describing either the aetiology, methods for diagnosis or treatment of vocal cord nodules were identified. A major problem highlighted by these descriptive studies is the lack of consensus on the definition of vocal cord nodules and relationship with possible aetiological factors. Not all clients with vocal nodules are symptomatic and some may like the quality of voice that the nodules give them. Out of 65 asymptomatic singing students Lundy found 2 with nodules diagnosed with video-stroboscopy (Lundy 1999). In addition Malmgren et al did not find a good association between both the patient's and Speech Therapist's perception of the voice after treatment and the size or change in size of the vocal nodules (Malmgren 1990). This raises the question as to whether the endoscopic appearance of vocal cords is actually a robust outcome measure in spite of it being one of the most widely used. A variety of other outcome measures were used to assess the effectiveness of the interventions many of which are subjective and most often there was no reference to validation. Some studies used psychological and quality of life measures, and a few used perceptual measures and objective voice measurements. There were problems with many of the studies of interventions for vocal cord nodules in that they had methodological and statistical errors such as inconsistent definitions of key variables, inadequate sample size, no confidence limits, short or missing follow-ups, too many separate endpoints and missing data.

The twenty (18 retrospective and two prospective) studies on intervention that had a methodological structure could roughly be divided into three groups:

1. microsurgery and postoperative voice therapy (Wendler 1971; Motta 1986; Bouchayer 1988; Cornut 1989; Kleinsasser 1991; Keilmann 1997)
2. voice therapy alone (Böhme 1969; Lacina 1972; Yamaguchi 1986; Yotsukura 1988; McFarlane 1990; Koufman 1991; Fex 1994; Benninger 1995)
3. voice therapy combined when evaluated necessary (without inclusion criteria) with microsurgery (Nagata 1983; Lancer 1988; Murry 1992; Krecicki 1993; Ford 1994; Remacle 1999).

No control groups were mentioned.

The six studies describing microsurgery and postoperative voice therapy included 644 patients with good result in 613. Eleven had recurrence out of 163 patients that had responded to the request for follow-up evaluation.

The eight studies concerned with voice therapy alone included 465 patients 282 of which had a good result. However 25 out of 134 responding to the request for follow-up evaluation had recurrence.

Voice therapy and eventual secondary microsurgery was carried out in six studies. Out of the 895 patients 666 had good results. There were 37 recurrences out of the 348 patients followed up.

A few trends were noted with the studies over time. In the later studies:

1. stroboscopy is used for confirming the diagnosis
2. researchers are more likely to identify compounding factors such as infections, allergy, acid reflux and environmental factors
3. pre- and post treatment quantitative voice analysis was more likely to have been performed.

REVIEWER'S CONCLUSIONS

Implications for practice

There is insufficient evidence, in the form of randomised controlled trials, on which to base reliable conclusions about the comparative effectiveness of surgical or non-surgical interventions for vocal cord nodules.

Implications for research

Although it is taught that vocal cord nodules form as a result of "voice abuse" this is increasingly recognised as being a being a rather simplistic view. Firstly "nodules" have a heterogenous appearance ranging from diffuse or more discrete swellings where the histological abnormality seems to be more concentrated in the superficial lamina propria to tiny discrete whitish lesions representing focal epithelial thickening. These various types may not necessarily have the same aetiology or prognosis and further studies need to be performed to determine the causative factors now that the lesions can be better visualized with newer imaging techniques.

Secondly the point at which nodules become pathological may depend on the individual's perception of their voice and the demands on their voice. As with any organ it is possible to improve its physical performance with training and optimisation of the environment in which it is expected to function. However there are likely to be physical limits to the sound production (in terms of stamina, pitch range, loudness, timbre and fine control) possible by the larynx based on the anatomical and physiological limitations of the individual's vocal apparatus. It may be necessary to recognise that the vocal demands are in fact too great for the individual or individual's larynx in their chosen working environment e.g. the amount of background noise or vocal cord irritation from a pollutant. These factors may be as important if not more important in determining the success of an intervention.

Thirdly there are no "gold standards" in objective outcome measures of voice treatment and often there is poor correlation between the more objective and subjective measures of assessment. The aims of treatment need to be carefully defined e.g. resolution of nodules on endoscopic examination, improvement in levels of impairment, activity and participation, acoustic, perceptual and aerodynamic measurements. Whatever measurements are chosen they must as objective as possible and have real patient relevance.

Fourthly there is no clear evidence which patients would benefit from surgery and which from speech therapy techniques. There is evidence that the more conservative speech therapy techniques are effective and therefore nowadays a RCT of non-surgical versus surgical techniques as a first line treatment of vocal nodules is probably unwarranted. However there is also evidence that surgery is beneficial but it is not clear how useful it is in those that have failed voice therapy. It may be that "failures" of therapy will also fail all types of intervention. Even if the nodules are removed, if the causative factors are not addressed, the nodules will recur. Alternatively one could argue that in resistant cases the damage to the mucosa is irreversible and this can only be corrected by surgical excision providing the correct conditions to allow speech therapy techniques to be effective. Although "speech therapy" is first line treatment, there is no consensus as to which of the techniques employed by speech therapists are most effective nor for how long they should be used. The techniques range from improving vocal hygiene, behaviour modification, 'abuse' reduction, vocal retraining and psychological support. It is likely that more than one factor usually requires intervention and that this should be individualised. Future studies would benefit from attempts at quantifying or at least defining each of these factors.

There is a general consensus that surgical treatment of the nodules should aim at removing the minimum amount of mucosa from the vocal cord. Whether cold surgical techniques are better than laser treatment has not been determined with certainty but with newer instruments the surgical result it is more likely to be dependent on the skill and experience of the surgeon rather than the tool.

The role of post-operative voice therapy is not clear with some claiming that recurrence is more likely without it. The chance of recurrence is likely to depend on compliance with pre-operative instructions in speech therapy techniques, anatomical, physiological, environmental and psychological factors. Some are likely to be "cured" with or without post-operative voice therapy and some will suffer further recurrence in spite of it.

There is no doubt that vocal nodules is a difficult condition to study and treat when the aetiology is not fully understood; in addition there are no robust objective measures of vocal function and there are many variables that can affect the outcome of an intervention. More patient orientated outcome measures are being developed and their value is being slowly defined. There is a need for a carefully designed prospective study to determine the place of surgery as second line treatment of vocal nodules. It is likely that a large number of subjects would be required. This could best be achieved with a multicentre trial.

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POTENTIAL CONFLICT OF INTEREST

None known.

TABLES

Characteristics of excluded studies

Study	Reason for exclusion
Benninger 1995	Allocation: retrospective without control group Outcome: observation time not given
Bouchayer 1988	Allocation: retrospective without control group Participants: age and sex not given Outcome: observation time not given
Böhme 1969	Allocation: retrospective without control group Participants: age and sex not given
Cornut 1989	Allocation: retrospective without control group Participants: age and sex not given Outcomes: follow-up and observation time not given
Fex 1994	Allocation: retrospective without control group Outcome: recurrence rate and observation time not given
Ford 1994	Allocation: retrospective without control group Participants: age and sex not given Outcome: recurrence rate not given, observation time not given
Keilmann 1997	Allocation: prospective, no control group for 5 pt. with nodules (but for others) Outcome: recurrence rate not given, observation time not given
Kleinsasser 1991	Allocation: retrospective without control group Participants: sex not given Outcome: recurrence rate not given, observation time not given
Koufman 1991	Allocation: retrospective without control group Outcome: recurrence rate and observation time not given
Krecicki 1993	Allocation: retrospective without control group Participants: age not given Outcome: recurrence rate not given, observation time not given

Lacina 1972	Allocation: retrospective without control group Participants: age not given Outcomes: recurrence rate not given, observation time nor given
Lancer 1988	Allocation: retrospective without control group Participants: age not given Outcomes: observation time not given
McFarlane 1990	Allocation: prospective, no control group Participants: age not given
Motta 1986	Allocation: retrospective, no control group Participants: age not given Outcomes: observation time not given
Murry 1992	Allocation: retrospective without control group Participants: age not given Outcome: observation time not given
Nagata 1983	Allocation: retrospective without control group Participants: age not given
Remacle 1999	Allocation: retrospective without control group Participants: age and sex not given
Wendler 1971	Allocation: retrospective without control group
Yamaguchi 1986	Allocation: retrospective without control group Outcome: recurrence rate not given
Yotsukura 1988	Allocation: retrospective without control group Participants: age not given Outcome: recurrence rate and observation time not given

ADDITIONAL TABLES

Table 01 Excluded Studies Additional Data Table

Study ID	Design	No. of Patients	Sex / Age	Intervention	No. Positive Effect	Recurrence	Observation Time

Fex 1994	Retrospective	3 patients	3 female adults 17 - 53 years	voice therapy	3 + effect	Not given	Not given
Ford 1994	Retrospective	105 patients (11 also with microwebs)		85 patients only voice therapy 20 microsurgery (after initial voice therapy no effect) + voice therapy	105 + effect	Not given	Not given
Keilmann 1997	Prospective	5 patients		microsurgery	5 + effect	Not given	4 months
Kleinsasser 1991	Retrospective	104 patients	16 - 45 years	microsurgery	83 + effect	Not given	Not given
Koufman 1991	Retrospective	86 patients	10 male 76 female adults 41.5 years (SD 15.9)	voice therapy	48 + effect	Not given	Not given
Krecicki 1993	Retrospective	251 patients	181 female 18 male 52 children	25 surgery 130 pharmacological + speech therapy 96 surgery + speech therapy	16 + effect 50 + effect 80 + effect	Not given	Not given
Lacina 1972	Retrospective	20 patients	13 female 7 males adults	voice therapy	15 + effect	Not given	Not given
Lancer 1988	Retrospective	20 patients	13 female 7 male adults	6 speech therapy 6 surgery + speech therapy 8 surgery	20 + effect	5 recurrence due to "organic" reasons (all in surgery group)	Not given
McFarlane 1990	Prospective (no control group)	44 patients	30 female adults 3 male adults 11 children	voice therapy	44 + effect	<1 % recurrence	one year
Motta 1986	Retrospective	50 patients		microsurgery	50 + effect	10 (reactive nodules or	Not given

						scarring)	
Murry 1992	Retrospective	59 patients	48 female 11 male	28 voice therapy 20 surgery + voice therapy 11 voice therapy + ENT follow-up	27 + effect 17 + effect 11 + effect	4 recurrence (group not given)	Not given
Nagata 1983	Retrospective	372 patients	209 female 119 male 44 children	72 surgery 300 voice therapy or no treatment * There appears to be some inconsistency between the text and the data tables in this study.	340 patients + effect	Recurrence in 4 patients out of 36 with follow-up information 23 recurrence of 77 with follow-up information and regular voice therapy	5 months
Remacle 1999	Retrospective	88 patients		preoperative voice therapy microsurgery + post operative voice therapy	Not extractable	1 recurrence	5 months
Wendler 1971	Retrospective	75 adult patients	70 female 5 male adults	75 microsurgery	75 + effect	10 had recurrence out of follow-up information in 62 patients	2 / 6 years
Yamaguchi 1986	Retrospective	30 adult patients	30 female	30 + voice therapy	20 + effect	Not given	Treatment time 3-4 months
Yotsukura 1988	Retrospective	7 patients	7 female	7 voice therapy	6 + effect	Not given	Not given

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GRAPHS

This review has no graphs.

COVER SHEET

Title	**Surgical versus non-surgical interventions for vocal cord nodules**
Reviewer(s)	**Pedersen M, McGlashan J**
Contribution of reviewer(s)	**METTE PEDERSEN: protocol development, trials searching, quality assessment of trials, data extraction, data analysis, review development.** **JULIAN MCGLASHAN: protocol development, trials searching, quality assessment of trials, data extraction, data analysis, review development.**
Issue protocol first published	2000/1
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Date new studies found and included/excluded	Information not supplied by reviewer
Date reviewers' conclusions section amended	Information not supplied by reviewer
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SOURCES OF SUPPORT

External sources of support

- No sources of support supplied

Internal sources of support

- No sources of support supplied

SYNOPSIS

Not enough evidence to compare surgical with non-surgical techniques to help remove vocal cord nodules.

Vocal cord nodules are swellings in the vocal cords. They cause hoarseness, throat discomfort, pain and an unstable voice when speaking or singing. The pain can be caused by infection, allergy or reflux. 'Voice abuse' is another factor caused by strain in the neck or singing above one's own range . The nodules can be surgically removed but non-surgical techniques such as speech and language therapy are also available. The review of trials found there was not enough evidence to compare surgery to other techniques. More research is needed.

Index Terms

Medical Subject Headings (MeSH)
Laryngeal Neoplasms [surgery] [therapy]; Vocal Cords
Mesh check words: Human