Authors' objectives
To assess the effectiveness of stereotactic pallidotomy for the treatment of Parkinson's disease (PD).

Searching
The authors searched the electronic databases of MEDLINE and Current Contents (1989 through November 10, 1997) using the textword 'pallidotomy' and the subject headings 'therapeutic electrical stimulation' and 'globus pallidus'. Reference lists of identified studies were also searched for additional relevant studies. The search was limited to English language publications.

Study selection
Study designs of evaluations included in the review
Case series data on PD patients treated with pallidotomy.

Specific interventions included in the review
Stereotactic pallidotomy using a radiofrequency electrode to thermally induce lesions within the posteroventral portion of the internal globus pallidus at about 1 to 2 mm intervals with and without mapping.

Participants included in the review
Patients undergoing treatment for Parkinson's disease who can no longer be medically managed due to diminished response and disabling drug dyskenesias. The age criteria for patients varied across studies. Patients with evidence of dementia, supranuclear palsy, striatonigral degeneration, mental illness, and life-threatening medical problems were generally excluded from the studies.

Outcomes assessed in the review
Clinical outcomes for PD patients after treatment with pallidotomy.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
The authors have not performed a formal quality assessment of the included studies however they have acknowledged and discussed the strength of their evidence with regard to the study designs of included studies.

Data extraction
The authors do not state who, or how many of the reviewers, performed the data extraction. The data were extracted in two tables for pallidotomy without mapping and pallidotomy with mapping using the categories of study/centre, number of patients, methods used, and results and comments.

Methods of synthesis
How were the studies combined?
The results were summarised in the two tables of the data extraction and discussed in a narrative review in the text. There was no statistical combining of the individual studies.

How were differences between studies investigated?
There were no statistical tests for homogeneity but for pallidotomy with and without mapping the authors state that the evidence was weakened by variations in patient selection criteria, procedure and follow-up interval, small sample size, and incomplete reporting of methodology and outcome measures.

**Results of the review**

There were 6 clinical studies included for pallidotomy without mapping with 237 participants.

There were 7 clinical studies included for pallidotomy with mapping with 245 participants.

For pallidotomy without mapping, favourable clinical outcome data were reported, such as dyskinesia eliminated or significantly alleviated in 82-89% of patients, significant improvements in Parkinsonian signs and increased score of Activities of Daily Living (ADL).

As in the studies without mapping, there were significant study design limitations that precluded the determination of the safety and efficacy of pallidotomy with mapping.

Reported morbidity ranged from 0 to 35% and includes worsening of balance, handwriting, and pre-existing depression, as well as dysarthria, dysphagia, cognitive impairment, facial weakness, hemiparesis, intracerebral hemorrhage, and visual field defects. Adverse side effects of pallidotomy can be transient or persistent. Long-term neuropsychological sequelae of pallidotomy are unknown; only 1 published study presents data beyond three years.

No studies were identified which compared mapping versus no mapping.

**Authors’ conclusions**

A previous review (Harstall, 1997, see Other Publications of Related Interest) stated that while relief of symptoms of PD and anecdotal evidence by patients of improved quality of life had been reported, the quality of the evidence was fair to poor with few data on long-term outcomes. This review suggests that pallidotomy with and without mapping for indicated PD patients alleviates drug-induced dyskinesias, significantly improves Parkinsonian signs, and elevates level of ADL independence. Relief of tremor was inconsistent. However, the prevailing evidence is insufficient to conclude that the benefits of pallidotomy outweigh the risks for the patients represented in the studies.

**CRD commentary**

The authors have clearly stated their research question and their inclusion and exclusion criteria. The literature search is good; the search strategy is stated but they have not sought unpublished data or non-English studies which may have missed additional relevant studies.

The data extraction is reported in tables and text and the narrative review was appropriate because of the small number of trials in each grouping, and the weakness of the methodological quality or the included studies. The quality of the included studies was not assessed but the authors have discussed the drawbacks and limitations of the included data. The authors have not reported on how the articles were selected, or how many of the reviewers were involved in the data selection and extraction and there were no formal tests for homogeneity.

Although the conclusions appear to follow from the results, because of the methodological limitations of the review, the conclusions should be viewed with caution.

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

Practice: The authors do not state any implications for practice.

Research: The authors state that further large-scale randomised trials are needed to substantiate the efficacy of pallidotomy with and without mapping.
Bibliographic details

Other publications of related interest

Indexing Status
Subject indexing assigned by CRD

MeSH
Parkinson Disease /surgery; United States

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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.