Percutaneous flexor tenotomy for treatment of neuropathic toe ulceration secondary to toe contracture in persons with diabetes: a systematic review

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CRD summary
The review concluded that there was no strong evidence for or against the use of percutaneous flexor tenotomy for the treatment of neuropathic toe ulceration secondary to toe contracture in patients with diabetes, and that more evidence is needed before solid recommendations can be made. Despite some methodological limitations of the review, the authors' cautious conclusions reflect the results.

Authors' objectives
To assess the efficacy and safety of the use of percutaneous flexor tenotomy for the treatment of neuropathic toe ulceration secondary to toe contracture in patients with diabetes.

Searching
CINAHL, EMBASE, PubMed, the Cochrane Library, and the American College of Physicians Journal Club were searched from inception to March 2009, with no date or language restrictions; search terms were reported. Several minimum incision surgery society websites were searched. Text books, abstracts, posters and proceedings from annual society meetings, and the Internet were searched. Studies that could not be obtained through purchase, librarian assistance, or e-mail contact with trial authors were not included in the review.

Study selection
Studies that evaluated the use of percutaneous flexor tenotomy of the hallux and/or lesser toes, for the treatment of neuropathic toe ulceration secondary to toe contracture, in patients with diabetes were eligible for inclusion. Studies were included if the participants were enrolled consecutively, and if the same percutaneous flexor tenotomy technique was used in all participants. Eligible studies had to have a mean follow-up of at least 12 months, and report complications related to the surgeries.

The included studies involved percutaneous flexor tenotomy of the hallux and/or lesser toes, with immediate ambulation as an outpatient unless the participants were hospitalised for other reasons. One of the studies included participants who had undergone other procedures at the same time (gastrocnemius recession), and also included participants who had prior toe and/or metatarsal amputations and adjacent toe ulceration; the other included study only evaluated participants who had not had toes amputated. The mean age of the participants ranged from 58 to 59.6.

The authors did not state how reviewers selected studies for the review.

Assessment of study quality
It appeared that the authors assessed the quality of the studies, but they did not state what quality criteria were used.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data were extracted only for participants with active ulceration.

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

Methods of synthesis
The studies were combined in a narrative synthesis.
**Results of the review**
Two retrospective case series were included in the review (n=42 percutaneous flexor tenotomies). The studies were considered to have poor methodologically quality.

In both studies, the incision used to perform the tenotomy and the index ulceration (without the need for amputation of the toe) healed in all participants. One trial reported that transfer ulceration occurred in 28% of the adjacent digits; no complications were reported in the other trial.

**Authors' conclusions**
There was no strong evidence for or against the use of percutaneous flexor tenotomy for the treatment of neuropathic toe ulceration secondary to toe contracture in patients with diabetes. More evidence is needed before solid recommendations can be made.

**CRD commentary**
The review assessed a clear question and was supported by appropriate inclusion criteria for participants, intervention, and outcomes. Attempts to identify all published relevant studies were undertaken by searching a number of databases and other sources. The number of reviewers involved in the systematic review process was not reported, so the potential for reviewer bias/error could not be ruled out.

Although the studies were reported to be of poor methodological quality, the criteria used to assess their quality were not reported. Some details of the studies were reported, although the review would have benefited from more detailed outcome data.

Despite some methodological limitations of the review, the authors' cautious conclusions reflect the results.

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

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

**Research:** The authors stated that more methodologically sound prospective cohort studies and randomised controlled trials are need that focus on the use of percutaneous flexor tenotomy.

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