Surgical Treatment for Posterior Ankle Impingement.
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CRD summary
This review concluded that endoscopic surgery was superior to open surgery for the treatment of posterior ankle impingement. The review included only small case series studies with no direct comparison between open and endoscopic surgical procedures. Therefore, the authors’ conclusions about the superiority of one technique over the other are not supported by the evidence presented.

Authors’ objectives
To assess the outcomes of open and endoscopic surgical procedures for the treatment of posterior ankle impingement.

Searching
MEDLINE, EMBASE, CINAHL and Cochrane Central Register of Controlled Trials (CENTRAL) were searched to March 2012; search terms were reported. Reference lists of relevant articles were handsearched for additional relevant studies.

Study selection
Studies that reported clinical outcomes, patient satisfaction or complications of surgical treatment for posterior ankle impingement were eligible for inclusion. Studies needed to include more than 10 adult patients with os trigonum syndrome, symptomatic os trigonum or talar compression syndrome. Studies of patients with isolated flexor hallucis longus tendinitis were excluded from the review. Studies in which patients underwent a combined posterior and anterior arthroscopic approach were excluded from the review. Review articles and expert opinion articles were excluded.

The included studies were published between 1991 and 2012. Where reported, the average age of participants was 30.3 years; the mean age of patients who underwent open surgery was 10 years younger than that of patients underwent endoscopy. Most patients were male. Some studies included professional athletes. The most common diagnosis was symptomatic os trigonum and the next common was posterior ankle impingement; other diagnoses included fracture of processus posterior tali and exostosis. Diagnosis was made by lateral or anteroposterior radiography in all studies, usually alongside another type of imaging or physical examination. Types of surgery included open lateral, open medial, the two-portal endoscopic approach described by van Dijk et al. and the two-portal endoscopic approach described by Horibe et al.

Two reviewers independently assessed studies for inclusion; disagreements were discussed until agreement was reached, in consultation with the senior authors where necessary.

Assessment of study quality
Two reviewers independently assessed the quality of the included studies using the Downs and Black scale; disagreements were resolved by discussion and in consultation with the senior authors.

Data extraction
Two reviewers independently extracted data on patient satisfaction, complication rate and clinical outcome measures, including the American Orthopaedic Foot and Ankle Society Ankle-Hindfoot scale and visual analogue scale and the time to return to full activity after surgery. Additional data were requested from study authors, where necessary. Complications were classified as major or minor.

Methods of synthesis
Studies were grouped by procedure (open procedure or endoscopic procedure) and results were combined and presented as weighted means and summed percentages, with ranges. Results for different types of open and endoscopic procedure were presented separately.

Results of the review
Sixteen case series studies (one prospective and 15 retrospective) were included in the review. There were 410 participants with 419 treated ankles. For open surgery studies, follow-up ranged from 22 to 60 months. For endoscopic procedure studies, follow-up ranged from 9.7 to 36 months. Quality scores assessed using the Downs and Black scale ranged from 7 to 19 (mean 15.3).

**Open surgery (six studies):** Three studies assessed patient satisfaction, which was good or excellent in 85.1% of cases. All six studies reported on complications. The combined complication rate was 15.9%. Major complications (all reflex sympathetic dystrophy) occurred at a rate of 2.1% and minor complications (mild nerve symptoms, superficial infection and haematoma) at 13.8%. Two studies reported American Orthopaedic Foot and Ankle Society scores with a combined postoperative mean score of 90.5 points. Three studies reported mean time to return to full activity and this ranged from seven to 20 weeks (weighted mean 16 weeks).

**Endoscopic procedures (10 studies):** Three studies assessed patient satisfaction, which was good or excellent in 80.9% of cases. The rate of major complications was 1.8% (deep infection, reflex sympathetic dystrophy, reoperation needed and severe nerve symptoms) and the rate of minor complications was 5.4% (mild nerve symptoms, superficial infection and persistent portal leakage). Seven studies reported American Orthopaedic Foot and Ankle Society scores with a combined postoperative mean score of 91.3 points and a mean increase at follow-up of 22.1 points. Four studies reported the mean time to return to full activity and this ranged from 5.9 to 12.9 weeks (weighted mean of 11.3 weeks).

**Authors' conclusions**
The level of evidence of the included studies was relatively low but endoscopic technique was superior to the open procedure for treating posterior ankle impingement.

**CRD commentary**
The review question and inclusion criteria were clear. The search strategy was adequate, with limited attempts to identify unpublished data. It was unclear whether any language restrictions were applied. Search dates were not reported. Study selection, data extraction and quality assessment were undertaken in duplicate and this reduced potential for reviewer bias and error.

An appropriate tool was used to assess the quality of the included studies. The studies were small case series of limited quality; the authors acknowledged that this limited the reliability of the individual study results and the results of the review. The authors acknowledged that considerable variation among studies in participant characteristics and length of follow-up – particularly between patients who underwent open surgery and those who underwent endoscopic procedures – was another limitation of the review.

None of the included studies directly compared open and endoscopic surgical procedures for the treatment of posterior ankle impingement. Therefore, the authors' conclusions about the superiority of one technique over the other are not supported by the evidence presented.

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

**Research:** The authors stated that their review underscored the need for high quality studies.

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