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Special Article

Conservative treatment of hallux rigidus: narrative review of scientific evidence

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Abstract

This study proposes an update on conservative treatment of hallux rigidus based on scientific evidence. This is a narrative review of 19 articles that analyzed conservative treatment of hallux rigidus in its different modalities. Conservative treatment is effective in approximately half of the patients with hallux rigidus, and footwear modifications, use of insoles, and hyaluronic acid injections are the most effective treatments, according to evidence-based medicine.

Level of Evidence III; Therapeutic Studies; Systematic Review of Level III Studies.

Keywords: Hallux rigidus; Conservative treatment; Evidence-based medicine; Review.

Introduction

Conservative treatment of hallux rigidus is especially indicated in mild and moderate stages. Its objective is to relief pain and to facilitate gait. It is also indicated, regardless of disease stage, in patients with a high number of medical comorbidities, in which surgery could compromise their baseline state. Although different therapeutic alternatives have been described, high quality scientific evidence is scarce[1-5]. However, most clinical guidelines recommend initiating conservative treatment, since it is effective in approximately half of the patients[3]. The aim of the present study is to conduct an update on the conservative treatment of hallux rigidus.

Rehabilitation treatment

Physical therapy

Manual therapy in hallux rigidus consists basically of mobilizing the first ray and the glenosesamoid system, as well as stretching flexor hallucis longus muscle and tendon and plantar short foot muscles[6,7]. However, scientific evidence on this therapy is uniformly low[4,8,9].

Modification of usual footwear and plantar orthosis

These treatment modalities may play an important role in conservative treatment of forefoot diseases, but scientific evidence remains weak[5].

Footwear

Footwear modifications seek to maintain the toe immobile during the third rocker, in order to promote pain relief. It is worth remembering that the third rocker, or propulsive phase, accounts for 30% of the gait cycle and that the fulcrum of the movement is at the level of the forefoot, in the metatarsophalangeal joint (MTPJ)[10,11]. General recommendations are based on the use of shoes with wide toe box, rigid sole, short heels, and rocker bottom sole[2]. Rocker bottom shoes, marketed as MBT® shoes, have been successfully used, although their efficacy has not been widely supported[12]. They are designed to facilitate normal gait with no need of mobilizing the MTPJ of the first ray during the take-off phase. The rocker bottom may be applied only in the anterior portion of the sole or cover the entire sole (Figure 1).

Study performed at the Orthopaedic Department, University Hospital of Canary Islands, La Laguna, Tenerife, Spain.

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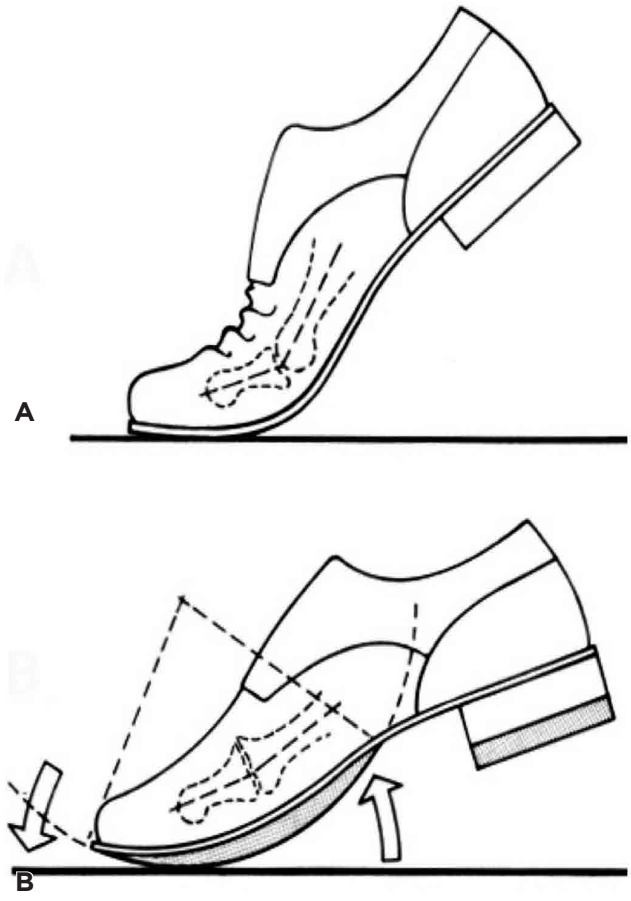

Figure 1. A) Normal shoe; B) Modified shoe with rocker bottom anterior insole, compensated with an elevation in the heel, during the third rocker of gait.

Viladot-Pericé et al.[11] and Ruiz-Escobar et al.[13] performed a radiological study comparing bare feet, feet wearing regular shoes, and feet wearing rocker bottom shoes, showing that the mobility of the first MTPJ is practically null during the third rocker of the gait (Figure 2).

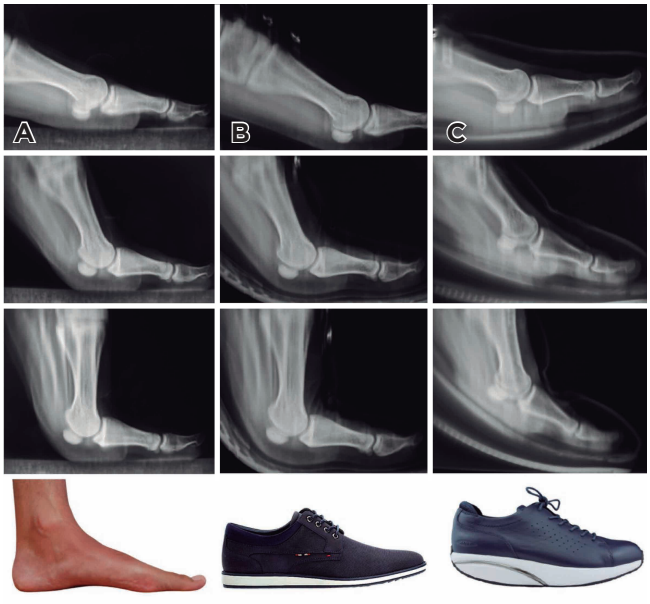

Figure 2. Profile radiography during the third rocker of gait. A) Bare foot. B) Foot with a normal shoe. C) Foot using an MBT® shoe. Remarkable loss of mobility in the metatarsophalangeal joint during the third rocker of gait.

Plantar orthosis

The most recommended are custom plantar orthosis with Morton's extension at the level of the first ray (Figure 3). A retrocapital bar may be added to improve adaptation of hallux to insole lengthening. The insole base should be made of a rigid material to properly maintain splinting of the first ray. The most common materials for their production are polypropylene and carbon fiber[13]. These orthoses may reduce symptoms (in the study by Grady et al.[2], 47% of patients respond to the use of insoles) but they are not usually well tolerated, and rates of withdrawal are high. Welsh et al.[14] performed an observational study of 35 patients with plantar orthosis with a 24-week follow-up. The authors concluded that orthoses could promote a reduction in mechanically induced pain at a

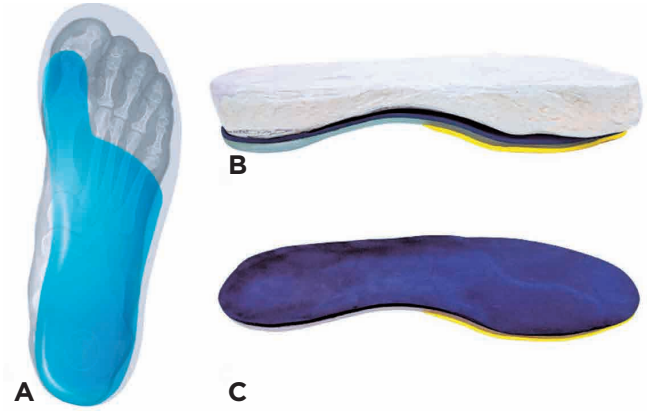

Figure 3. A) Scheme of plantar support with Morton's extension in a foot with hallux rigidus. B) Adaptation of the custom plantar support to a patient mold. C) 4-mm thick polypropylene insole with Morton's extension.

level similar to that of analgesic treatment. Smith et al.[15] conducted a long-term study (average 14.4 years) of 22 patients to explore the efficacy of conservative treatment with footwear modification, with an average follow-up of 14.4 years: 13 patients modified their footwear by wearing shoes with wide toe box and 7 patients reported pain relief by simply avoiding the use of high heels. Of the entire series, 63% of patients would maintain their decision to undergoing conservative treatment. Moreover, pain intensity remained constant in 92%

of cases and apparently there is no association between the symptoms reported by patients and radiological evidence of disease.

Pharmacological treatment

Nonsteroidal anti-inflammatory and analgesic drugs

No report has been published specifically investigating the use of these drugs in the treatment of hallux rigidus; thus, their systematic use is not recommended[16].

Symptomatic slow action drug osteoarthritis -SYSADOA-(glucosamine, chondroitin, diacerein)

There is no scientific evidence justifying its indication in hallux rigidus[16].

Injections

Solan et al.[17] state that with steroid injections are effective in early stages. Pons et al.[18] published a comparative study of steroid versus hyaluronic acid and showed the superiority of the latter with regard to duration of the analgesic effect.

Literature on conservative treatment of hallux rigidus is not only scarce but also has low scientific evidence. However, it seems advisable to start this therapy before evaluating the possibility of surgical treatment, because conservative treatment is apparently effective in at least 50% of patients[3]. There is a moderate grade of recommendation for footwear modifications, use of custom plantar orthoses, and injections[1-3,19]. It was not possible to demonstrate the usefulness of either anti-inflammatory or analgesic drugs, or of manual therapy (physical therapy) in any of its modalities[1].

Conclusions

Conservative treatment of hallux rigidus is supported by the scientific literature, being effective in 50% of patients. The grade of recommendation is moderate with regard to footwear modifications, use of custom insoles, and injections, especially intra-articular hyaluronic acid injections.

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