

# Hallux rigidus

## What is hallux rigidus?

**Hallux rigidus** means 'stiff great toe' and was first described in the orthopaedic literature towards the end of the nineteenth century. The degenerative changes can be mild to severe, as can the consequent disability. It affects adults and adolescents and there may or may not be a history of trauma.

## Causes of hallux rigidus (aetiology) <sup>[1]</sup>

The cause of hallux rigidus is unclear. While arthritis can be caused by traumatic or iatrogenic injuries that directly cause damage to the articular cartilage of the first metatarsophalangeal (MTP) joint, most often the aetiology of hallux rigidus is idiopathic. Almost two-thirds of patients have a family history and up to 79% patients have bilateral involvement.

As hallux rigidus progresses, the normal coupling of the centre of rotation of the proximal phalanx and metatarsal head is disrupted, leading to eccentric gliding of the proximal phalanx on the metatarsal head. Osteophytes form preferentially on the dorsal surface and are often horseshoe-shaped. There is a progressive decrease in range of motion, primarily with dorsiflexion.

One study of 110 patients showed an association between: <sup>[2]</sup>

- Hallux rigidus and hallux valgus interphalangeus.
- Family history of hallux rigidus and bilateral hallux rigidus.
- Trauma and hallux rigidus (unilateral cases).

There was no association between hallux rigidus and:

- Pes planus.

- Length of the first metatarsal.
- Hallux valgus.
- Footwear.
- Occupation.
- Obesity.
- Metatarsus adductus.

## How common is hallux rigidus? (Epidemiology)

- Hallux rigidus is the most common degenerative disorder of the foot and it is one of the most common causes of forefoot pain.<sup>[3]</sup> <sup>[4]</sup>
- Most cases are bilateral and many have a family history.<sup>[5]</sup>
- Women are affected more often than men.<sup>[6]</sup>
- It most commonly presents after the age of 40 years, although it can occur at young age. Hallux rigidus affects 2.5% of people over age 50.<sup>[7]</sup>

## Symptoms of hallux rigidus (presentation)<sup>[5]</sup> <sup>[6]</sup>

### History

Presentation is with pain:

- Worse with walking, worse at extremes of dorsiflexion, just before the toe leaves the ground.
- May be worse when wearing particular shoes, particularly those with heels.
- Localised on the dorsal surface of the great toe.
- More diffuse pain in the lateral forefoot (caused by compensatory gait).
- Dysaesthesia caused by compression of the dorsomedial cutaneous nerve (footwear with osteophyte).
- Late diffuse pain of advanced degenerative disease.

There may also be stiffness.

## Examination

There is osteophytic swelling to the dorsum of the first MTP joint, which is usually tender. There is limited first MTP dorsiflexion in particular and also limited plantar flexion. Where presentation is late, there will be pain and crepitus on movement of the joint.

Gait may be affected. There may be limited dorsiflexion as the toe leaves the floor. There may be an antalgic gait.

## Differential diagnosis

- [Hallux valgus](#).
- Other forms of arthritis.
- Surgical or traumatic arthropathy.

## Diagnosing hallux rigidus (investigations)

Plain X-ray reveals the radiographic features of the degenerative changes (see 'Staging', below):

- Osteophytes.
- Flattened metatarsal head.
- Joint space narrowing.
- Sclerosis.
- Subchondral cysts.

## Staging<sup>[6]</sup>

Often classified as:

- Mild - maintained joint space, minimal changes.
- Moderate - some narrowing, cysts and sclerosis.
- Severe - severe changes with loose bodies.

A number of classification systems exist, which hinders interpretation of research findings. A 2008 review found the Coughlin and Shurnas classification, which incorporates radiographic features, to be the preferred system.<sup>[4]</sup>

## **Coughlin and Shurnas classification**

- **Grade 0:**
  - Dorsiflexion 40–60°.
  - Normal radiography.
  - No pain.
- **Grade 1:**
  - Dorsiflexion 30–40°.
  - Dorsal osteophytes.
  - Minimal/no other joint changes.
- **Grade 2:**
  - Dorsiflexion 10–30°.
  - Mild-to-moderate joint narrowing or sclerosis.
  - Osteophytes.
- **Grade 3:**
  - Dorsiflexion less than 10°.
  - Severe radiographic changes.
  - Constant moderate-to-severe pain at extremities.

- **Grade 4:**
  - Stiff joint.
  - Severe changes with loose bodies and osteochondritis dissecans.
  - Pain through the entire range of movement.

## Management of hallux rigidus<sup>[5]</sup> <sup>[6]</sup>

Non-operative management, including non-steroidal anti-inflammatory drugs, intra-articular injections, shoe modification, activity modification and physiotherapy, should always be attempted for all hallux rigidus patients.<sup>[7]</sup>

In patients with mild arthritis, operative procedures focus on removing excess osteophytes (cheilectomy) to prevent dorsal impingement with or without a concomitant osteotomy (Moberg) to improve or shift range of motion into a less painful arc. In patients with more advanced arthritis, operative management has centred on arthrodesis of the first MTP joint.<sup>[1]</sup>

### Non-surgical or conservative approaches

- Analgesics including non-steroidal anti-inflammatory drugs (NSAIDs).
- Strapping of the toe.
- Orthotics to limit extreme dorsiflexion.
- Modification of activities (for example, avoid kneeling/squatting).
- Modification of shoes/shoe choice.
- Physical therapy (limited evidence).<sup>[8]</sup>
- Injection with sodium hyaluronate may be helpful in early stages; however, evidence is slim.

### Surgical therapy

If there is ongoing pain despite non-surgical interventions, surgery is usually offered. Evidence is poor to help determine the best treatment option. Choice depends on:

- Stage of involvement.
- Degree of limitation of the range of movement.
- Activity levels of the patient.
- Preference of the surgeon and the patient.

A number of procedures may be performed, which may be joint-sparing or otherwise. Options include:

- Various types of osteotomy. A number of different techniques may be used, and aim to be joint-sparing in nature.
- Cheilectomy.<sup>[9]</sup> Osteophytes are removed, along with some of the dorsal metatarsal head. May be performed in conjunction with osteotomy, such as a proximal phalanx osteotomy. In some cases, minimal destructive surgery is needed and this can be considered a joint-sparing procedure.<sup>[10]</sup>
- Arthrodesis. This is standard treatment for severe hallux rigidus.
- Arthroplasty. Several types of arthroplasty are available, including interpositional arthroplasty, hemiarthroplasty, resurfacing of the metatarsal head and various types of implants.<sup>[11]</sup> There are no long-term data about most types of arthroplasty at this time and, therefore, there are no clear evidence-based recommendations about their use.

## Complications of hallux rigidus

These depend on the particular treatment used.

## Prognosis

This again depends on the severity, patient activity and expectation as well as the particular treatment used. Generally speaking, operative treatments are offered to people in whom non-operative treatments have been ineffective. There are few studies into long-term outcomes.

---

## Further reading

- [Becker BA, Childress MA](#); Common Foot Problems: Over-the-Counter Treatments and Home Care. *Am Fam Physician*. 2018 Sep 1;98(5):298-303.
- [Park CH, Chang MC](#); Forefoot disorders and conservative treatment. *Yeungnam Univ J Med*. 2019 May;36(2):92-98. doi: 10.12701/yujm.2019.00185. Epub 2019 May 14.
- [Patel J, Swords M](#); Hallux Rigidus. *StatPearls*, Sept 2022.
- [Kon Kam King C, Loh Sy J, Zheng Q, et al](#); Comprehensive Review of Non-Operative Management of Hallux Rigidus. *Cureus*. 2017 Jan 20;9(1):e987. doi: 10.7759/cureus.987.

## References

1. [Ho B, Baumhauer J](#); Hallux rigidus. *EFORT Open Rev*. 2017 Mar 13;2(1):13-20. doi: 10.1302/2058-5241.2.160031. eCollection 2017 Jan.
2. [Coughlin MJ, Shurnas PS](#); Hallux rigidus: demographics, etiology, and radiographic assessment. *Foot Ankle Int*. 2003 Oct;24(10):731-43.
3. [Kunnasegaran R, Thevendran G](#); Hallux Rigidus: Nonoperative Treatment and Orthotics. *Foot Ankle Clin*. 2015 Sep;20(3):401-12. doi: 10.1016/j.fcl.2015.04.003. Epub 2015 Jun 9.
4. [Beeson P, Phillips C, Corr S, et al](#); Classification systems for hallux rigidus: a review of the literature. *Foot Ankle Int*. 2008 Apr;29(4):407-14. doi: 10.3113/FAI.2008.0407.
5. [Deland JT, Williams BR](#); Surgical management of hallux rigidus. *J Am Acad Orthop Surg*. 2012 Jun;20(6):347-58. doi: 10.5435/JAAOS-20-06-347.
6. [Polzer H, Polzer S, Brumann M, et al](#); Hallux rigidus: Joint preserving alternatives to arthrodesis - a review of the literature. *World J Orthop*. 2014 Jan 18;5(1):6-13. doi: 10.5312/wjo.v5.i1.6. eCollection 2014 Jan 18.
7. [Lam A, Chan JJ, Surace MF, et al](#); Hallux rigidus: How do I approach it? *World J Orthop*. 2017 May 18;8(5):364-371. doi: 10.5312/wjo.v8.i5.364. eCollection 2017 May 18.
8. [Zammit GV, Menz HB, Munteanu SE, et al](#); Interventions for treating osteoarthritis of the big toe joint. *Cochrane Database Syst Rev*. 2010 Sep 8;(9):CD007809. doi: 10.1002/14651858.CD007809.pub2.
9. [Razik A, Sott AH](#); Cheilectomy for Hallux Rigidus. *Foot Ankle Clin*. 2016 Sep;21(3):451-7. doi: 10.1016/j.fcl.2016.04.006. Epub 2016 May 24.
10. [Hamid KS, Parekh SG](#); Clinical Presentation and Management of Hallux Rigidus. *Foot Ankle Clin*. 2015 Sep;20(3):391-9. doi: 10.1016/j.fcl.2015.04.002. Epub 2015 Jul 2.
11. [Kline AJ, Hasselman CT](#); Resurfacing of the Metatarsal Head to Treat Advanced Hallux Rigidus. *Foot Ankle Clin*. 2015 Sep;20(3):451-63. doi: 10.1016/j.fcl.2015.04.007. Epub 2015 Jul 8.

**Disclaimer:** This article is for information only and should not be used for the diagnosis or treatment of medical conditions. Egton Medical Information Systems Limited has used all reasonable care in compiling the information but makes no warranty as to its accuracy. Consult a doctor or other healthcare professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

Authored by:	Peer Reviewed by: Dr Krishna Vakharia, MRCGP	
Originally Published: 20/11/2023	Next review date: 21/06/2023	Document ID: doc_7198

View this article online at: [patient.in/doctor/hallux-rigidus](https://patient.in/doctor/hallux-rigidus)

Discuss Hallux rigidus and find more trusted resources at [Patient](#).



To find out more visit [www.patientaccess.com](https://www.patientaccess.com)  
or download the app



Follow us

