

Total Toe Replacement in the United States



What Is Known and What Is on the Horizon

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KEYWORDS

• Total toe arthroplasty • Bipolar toe arthroplasty • Hallux rigidus

KEY POINTS

- There is a high rate of radiologic loosening with arthroplasty implants of the first metatarsophalangeal joint.
- The presence of loosening does not always correlate with patient satisfaction.
- Failed arthroplasties may be treated with fusion with structural bone graft.
- Well-designed and controlled investigations with modern implants are needed to guide treatment recommendations.

INTRODUCTION: NATURE OF THE PROBLEM

Arthritis of first metatarsophalangeal joint can be a painful and debilitating problem and is one of the most common pathologies affecting the forefoot. Patients often present with pain and limited range of motion (ROM) of the first metatarsophalangeal joint. The pain is typically worse with dorsiflexion of the hallux and is exacerbated by prolonged activity. Furthermore, the dorsal osteophyte may cause pain with shoe wear (**Fig. 1**). Patients may also develop lateral forefoot symptoms as patients attempt to off-load the first metatarsophalangeal joint by transferring weight laterally. Patients are often most comfortable in flat shoes because their symptoms are exacerbated with shoes having any elevation of the heel.

Physical examination often reveals pain with ROM along with swelling and tenderness to palpation of the first metatarsophalangeal joint. ROM is typically reduced with the greatest deficit found with dorsiflexion.

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Fig. 1. Clinical appearance of foot with hallux rigidus with dorsal osteophyte that caused pain when donning shoes.

Radiographic evaluation may reveal joint space narrowing on the anteroposterior and oblique views. The lateral view may also show a dorsal osteophyte along with elevatus of the first metatarsal (MT). Elevatus of the MT is relative dorsiflexion of the MT in relationship to the proximal phalanx of the hallux (**Fig. 2**).

Grading systems are available for hallux rigidus with the Coughlin and Shurnas¹ system most commonly used. It takes into account both physical examination findings and radiographic findings (**Table 1**). A radiographic grading system is offered by Hattrup and Johnson²:

- Grade 1: well-preserved joint space with mild to moderate osteophytes
- Grade 2: reduced joint space with moderate osteophytes, sclerosis, and cysts
- Grade 3: complete loss of joint space, marked osteophytes, and subchondral cysts within the MT head

Treatment of hallux rigidus typically begins with conservative methods. Approximately half of patients are treated successfully with nonoperative treatments.³ Options



Fig. 2. Standing lateral radiograph shows both the dorsal osteophyte of the first MT as well as the elevatus of the first MT.

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