

Ten-Year Follow-Up of Metatarsal Head Resurfacing Implants for Treatment of Hallux Rigidus

Henry Hilario, DPM, AACFAS¹, Alan Garrett, DPM, FACFAS², Travis Motley, DPM, MS, FACFAS², Sumihiro Suzuki, PhD³, Brian Carpenter, DPM, FACFAS⁴

¹ Chief Resident, Foot and Ankle Surgery Division, Department of Orthopaedics, John Peter Smith Hospital, Fort Worth, TX

² Assistant Professor, Department of Orthopaedics, John Peter Smith Hospital, University of North Texas Health Science Center, Fort Worth, TX

³ Associate Professor and Chair, Department of Biostatistics and Epidemiology, University of North Texas Health Science Center, Fort Worth, TX

⁴ Professor, Department of Orthopaedics, John Peter Smith Hospital, University of North Texas Health Science Center, Fort Worth, TX

ARTICLE INFO

Level of Clinical Evidence: 2

Keywords:

arthrodesis
hallux limitus
hallux rigidus
HemiCAP®
metatarsophalangeal joint

ABSTRACT

Controversy remains regarding the use of arthroplasty versus arthrodesis in the surgical treatment of late-stage hallux rigidus. The purpose of our retrospective study was to report the long-term follow-up results of the metatarsal head resurfacing implant used for hemiarthroplasty. The patient assessments were conducted using the American Orthopaedic Foot and Ankle Society (AOFAS) metatarsophalangeal clinical rating system and a satisfaction questionnaire. A total of 59 consecutive implantations were performed from January 2005 to December 2009 at our institution. Of the 59 patients, 2 had died and 12 were lost to follow-up, for a 76.3% follow-up rate (45 of 59 procedures) at a mean of 117.67 (range 96 to 143) months. The mean overall AOFAS scale score was 90.6 ± 7.6 . The AOFAS pain scale score was 37.78 ± 4.71 . One implant was removed, and all remaining patients were happy with their outcome and would repeat the procedure on their other foot, if needed. A subset of patients from a previous mid-term study at our institution showed no significant change in the AOFAS scale scores. Of these 32 patients, 30 (93.75%) were available for follow-up examination at a mean of 122.62 (range 96 to 143) months. We were able to obtain long-term results for 32 implants (30 patients), resulting in a 10-year follow-up rate of 93.7%. With the minimal resection required for this implant, salvage arthrodesis remains a viable option if revision is needed. The surgical treatment of late-stage hallux rigidus with metatarsal head resurfacing allows for low-risk and excellent outcomes at long-term follow-up point.

© 2017 by the American College of Foot and Ankle Surgeons. All rights reserved.

Hallux rigidus describes a painful condition that affects the great toe at the metatarsophalangeal joint (MPJ). This degenerative joint disease results in limited dorsiflexion of the joint, painful range of motion, and proliferative bone formation. The pain is believed to be caused by shearing forces at the arthritic joint (1). The attempted motion at the joint is restricted by periarticular spurring. Hallux rigidus can result in radiographic changes, including osteophyte formation, loose bodies, subchondral sclerosis, flattening of the metatarsal head, and joint space narrowing (1). Reports on the etiology of hallux rigidus have varied, as further described by Coughlin and Sherman (1). Their study found that hallux rigidus was not associated with metatarsus elevatus, first ray hypermobility, metatarsal length, hallux valgus, shoe gear, or occupation. However, they did find that it was associated with hallux valgus interphalangeus,

trauma, female gender, a flat-shaped joint on radiographs, and a familial history in bilateral cases (1).

Treatment of hallux rigidus varies depending on disease severity and the age and physical demands of the patient. Several treatment options have been reported. Cheilectomies or corrective osteotomies of the MPJ are effective for early- and intermediate-stage hallux rigidus. Arthrodesis or arthroplasty of the MPJ is generally reserved for more severe arthritis (2).

The area of controversy lies in which of the 2 options, arthroplasty or arthrodesis, will be best for a patient's requirements, activities, and pain levels. Arthrodesis has been long reported as the reference standard treatment because of its reliability and longevity. However, it is not without risks, such as transfer metatarsalgia, shoe wear limitations, malunion, and nonunion (3,4). The constructs for arthroplasty have several permutations. Total arthroplasty, or a bipolar construct, is composed of various materials, including silicone or metal, at both sides of the joint. Another option is hemiarthroplasty, or a unipolar construct, which addresses either the proximal phalanx or the metatarsal head.

Studies have attempted to compare arthrodesis and arthroplasty. Many of the higher quality studies have included a proximal phalanx

Financial Disclosure: None reported.

Conflict of Interest: None reported.

Address correspondence to: Henry Hilario, DPM, AACFAS, ArkLaTex Foot & Ankle Specialists, 385 West Bert Kouns, Suite 200, Shreveport, LA 71106.

E-mail address: henryhilarioDPM@gmail.com (H. Hilario).

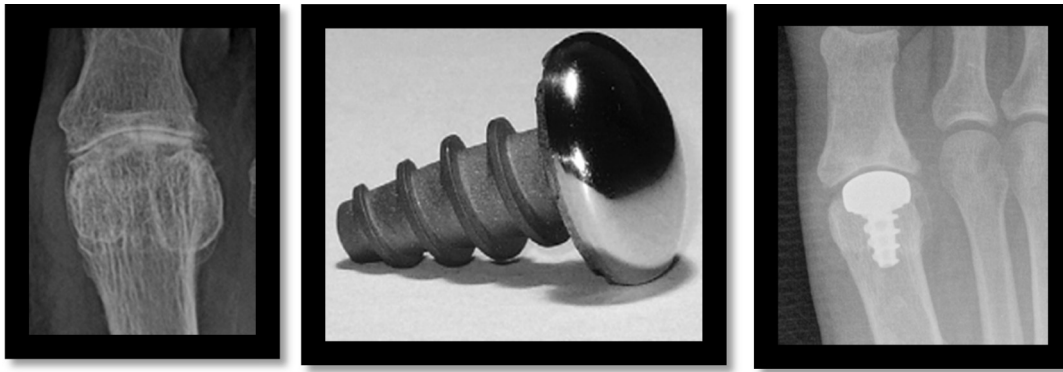


Fig. 1. Metatarsal head implant.

implant for hemiarthroplasty rather than a metatarsal implant. Raikin et al (5) compared arthrodesis and proximal phalanx implant arthroplasty with a 79-month follow-up period. They noted a failure rate of 24% in the arthroplasty group and concluded that arthrodesis at the 30-month follow-up mark was more predictable in alleviating symptoms (5). Erdil et al (6) compared total joint arthroplasty, arthrodesis, and MPJ resurfacing arthroplasty, noting that all 3 procedures showed improvements in the American Orthopaedic Foot and Ankle Surgery (AOFAS) metatarsophalangeal clinical rating system scores and visual analog scale (VAS) scores. The AOFAS scale scores were lower in the arthrodesis group owing to lack of motion; however, that group also had a significant increase in the VAS scores (6).

Arthrodesis for the treatment of hallux rigidus has been advocated as the reference standard; however, challenges remain regarding patient satisfaction. Managing patient expectations are imperative in the treatment of hallux rigidus. The disadvantages of arthrodesis include

Table 1
Possible points for American Orthopaedic Foot and Ankle Society metatarsophalangeal joint-interphalangeal joint scale score

Item	Points
Pain	40 Possible
None	40
Mild, occasional	30
Moderate, daily	20
Severe, almost always	0
Function	45 Possible
Activity limitations	
None	10
Limited recreational activities	7
Limited recreational and daily activities	4
Severe limitation, walker, brace	0
Footwear requirements	
Conventional shoes, no inserts needed	10
Comfort footwear, with shoe insert	5
Modified shoe or brace	0
Big toe joint motion (extension plus flexion)	
Normal or mild ($\geq 75^\circ$)	10
Moderate (30° to 74°)	5
Severe restriction ($< 30^\circ$)	0
Interphalangeal joint motion (flexion)	
No restriction	5
Severe restriction ($< 30^\circ$)	0
Stability of joint in all directions	
Stable	5
Unstable, able to dislocate	0
Callous formation	
No callous, no symptoms	5
Callous, symptomatic	0
Alignment	15 Possible
Good, big toe well aligned	15
Fair, some degree of malalignment	8
Poor, symptomatic malalignment	0
Total	100

shoe wear limitations, activity modifications, malunion or nonunion of the fusion site, metatarsalgia, and painful hardware. The loss of motion at the joint can be an issue for those with occupations requiring kneeling or squatting, runners, and adult females attempting to wear high heels. Biomechanical changes such as altered gait, decreased step length, and loss of ankle plantarflexion can also occur with MPJ arthrodesis (7).

The HemiCAP[®] system (Arthrosurface, Franklin, MA) is an implant used for hemiarthroplasty of the metatarsal head (Fig. 1). It functions by resurfacing the metatarsal head through insertion of a 2-part implant composed of a cobalt-chromium articular component and a titanium Morse taper post. The implant allows for minimal bone resection of the joint and does not interfere with the intrinsic muscle insertions at the proximal phalanx. The system also allows for decompression of the joint and a stable screw-like fixation of the implant. This construct allows for minimal bone loss, although this still leaves the arthrodesis without a bone graft as a viable salvage option. Several studies during the previous 10 years have investigated hemiarthroplasty with the HemiCAP[®] implant (Arthrosurface) as an effective treatment of severe hallux rigidus. These investigations studied the short- and medium-term clinical results and reported favorable outcomes (6,8–11).

To date, no studies have examined the long-term results of patients who have undergone hemiarthroplasty of the metatarsal with a resurfacing implant. Because previous studies have shown promising short- and mid-term follow-up results, we hypothesized that this procedure would also yield favorable long-term results. The primary purpose of our retrospective study was to investigate the long-term outcomes of patients who had undergone hemiarthroplasty with the HemiCAP[®] implant (Arthrosurface). We also wished to investigate the outcomes of the subset of patients included in the prospective study by Carpenter et al (9) at the same institution that had examined the mid-term follow-up data for this procedure.

Patients and Methods

We used the AOFAS clinical rating system for the hallux to measure the outcomes of our patients. The AOFAS system is used to evaluate the condition of the first metatarsophalangeal and interphalangeal joints (12,13). This score is used to assess pain, function, and alignment (Table 1). Secondary questions were asked in addition to the AOFAS clinical rating system (Table 2). These additional questions were created by us and were used to further evaluate patient satisfaction and pain medication requirements and

Table 2
Secondary questionnaire

Question	Possible Response
Based on your experience and current condition of the toe, would you undergo the procedure to the contralateral foot?	Yes, no
Do you currently take pain medication for your toe?	Daily, occasionally, never
Have you undergone or been recommended to undergo another surgery to the same toe?	Yes, no

Download English Version:

<https://daneshyari.com/en/article/5575933>

Download Persian Version:

<https://daneshyari.com/article/5575933>

[Daneshyari.com](https://daneshyari.com)