



ORIGINAL ARTICLE

Keller arthroplasty vs hemi-implant arthroplasty for the surgical treatment of hallux rigidus: Mid-term comparative analysis



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KEYWORDS

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Keller–Brandes;
Hemi-implant;
First ray disorder;
Podiatric surgery

Abstract

Introduction: There is no clear consensus regarding the best surgical treatment options in patients with hallux rigidus. The present study compares the effectiveness of two commonly used techniques in advanced cases of hallux rigidus: Keller arthroplasty and hemi-implant arthroplasty.

Patients and methods: All cases of hallux rigidus that underwent surgical treatment with either Keller or hemi-implant arthroplasties during the year 2004 were analyzed. AOFAS scale and angles in A/P X-rays were used to compare at the preoperative moment and at 6 months, 1, 3 and 5 years postoperatively.

Results: A total of 54 feet were included in the study (27 in each group of treatment). No differences were observed between groups in the AOFAS scale in all the postoperative moments analyzed. Significant differences were observed in the AOFAS score and in the complications of the techniques in each separate group by age factor.

Discussion: The results of the techniques of podiatric surgery of Keller and hemi-implant arthroplasty seem to be dependent on the age of the patient and progress time. Keller arthroplasty has offered better results in patients over 55, independently of the sex, but transfer metatarsalgia at 3 and 5 years is a common postoperative finding. The hemi-implant procedure seems to be more beneficial in patients less than 55.

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PALABRAS CLAVE

Hallux rigidus;
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metatarsofalángica;
Cirugía del pie;
Artroplastia;
Keller-Brandes;
Hemiimplante;
Primer radio;
Cirugía podológica

Artroplastia de Keller-Brandes versus artroplastia con hemiimplante para el tratamiento quirúrgico del hallux rigidus: análisis comparativo a medio plazo

Resumen

Introducción: Actualmente no están claras cuáles son las mejores opciones de tratamiento quirúrgico para los pacientes con hallux rigidus. El presente estudio compara la eficacia de 2 de las técnicas comúnmente utilizadas para el tratamiento de esta dolencia en casos avanzados: artroplastia de resección de Keller-Brandes y artroplastia con hemiimplante.

Pacientes y métodos: Se analizaron todos los casos operados en el año 2004 mediante las técnicas de Keller-Brandes y hemiimplante en pacientes con hallux rigidus. Para la valoración, se utilizó la escala AOFAS y diversas mediciones angulares del primer radio en radiografía dorso-plantar en los momentos preoperatorio, postoperatorio a los 6 meses, al año, a los 3 y a los 5 años.

Resultados: Se incluyeron un total de 54 pies intervenidos (27 en cada grupo) en el estudio. No se observaron diferencias entre ambos grupos en la escala AOFAS en ninguno de los momentos posquirúrgicos evaluados. Se encontraron diferencias en cada grupo por separado en la escala AOFAS y en las complicaciones de cada técnica con respecto al factor edad.

Discusión: Las complicaciones y la satisfacción de las técnicas empleadas en cirugía podológica de Keller-Brandes y hemiimplante parecen ser dependientes de la edad del paciente y del tiempo de evolución posquirúrgico. La técnica de Keller-Brandes ha mostrado ser más ventajosa en pacientes mayores de 55 años de edad, de cualquier sexo, pero al cabo de 3-5 años es común la aparición de metatarsalgias por transferencia. La técnica de hemiimplante parece ser más ventajosa en pacientes de 55 años de edad o menos.

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Introduction

Hallux rigidus deformity can be defined as a degenerative arthritis of the first metatarsophalangeal joint (cartilage degeneration inside the joint that can occur in any other joint of the human body) that is characterized by pain and progressive loss of movement of the joint accompanied with dorsal bone spurs in the base of the phalanx and the metatarsal head.^{1,2} Hallux rigidus is the second most common disorder that affect the big toe with a estimated incidence of 2.5% in the adult population, although it can appear also in young people with other types of arthritis.³

Treatment of this condition can pose a considerable challenge for the clinician. On one side, conservative measures tend to be ineffective in the long run^{4,5} and in the other side, there exists controversy regarding which is the best surgical treatment for patients with hallux rigidus, specially in advanced cases. Whereas in the initial cases decompression osteotomies may have a place in the therapeutic armamentum of this condition, in advanced cases surgical treatments are based on joint destruction in the form of resection arthroplasty (Keller procedure), implant (or hemi-implant) arthroplasty or arthrodesis.^{6,7}

Regarding these last techniques, there is no enough evidence yet about which is the best procedure that involves destruction of the joint for advanced cases of hallux rigidus. With the purpose of getting more knowledge with these techniques, the present paper tries to compare the results of the Keller arthroplasty and hemi-implant arthroplasty in a cohort of hallux rigidus patients. This work is intended to compare advantages and disadvantages

of both techniques based in radiographic measures, AOFAS scale and complications rates of both techniques.

Patients and methods**Population**

Population of the present study was composed by all patients with hallux rigidus in stages III and IV² that consecutively underwent surgery that consisted in Keller arthroplasty or hemi-implant arthroplasty during the year 2004 in two clinical offices (situated in Madrid and Ciudad Real), where the senior author of this paper (L.D.A.) worked at that time. Patients were followed during 5 years post surgery. Exclusion criteria consisted in the presence iatrogenic hallux rigidus from previous surgeries, neurological diseases, rheumatic diseases, joint infections and osteomyelitis, and patients without radiographic or clinical information at 1 year, 3 years and 5 years postop. Because the number of cases in the Keller arthroplasty group was bigger than that of the hemi-implant group, cases of the Keller arthroplasty group were randomly selected till the same number of cases were achieved in both groups. The present study followed the ethical principles for medical research of the World Medical Association Declaration of Helsinki.⁸

Surgical techniques

All patients underwent an arthroplasty procedure for the first metatarsophalangeal joint for hallux rigidus treatment

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