



ORIGINAL ARTICLE

Proximal interphalangeal joint replacement: A comparison between the volar and dorsal approach[☆]



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Received 13 May 2013; accepted 1 April 2014

KEYWORDS

Arthroplasty;
Interphalangeal;
Approach;
Volar;
Dorsal

Abstract

Introduction: Arthropathy of the proximal interphalangeal (PIP) joint symptoms is very restrictive, and in some cases arthroplasty is required. In most of the reported series of PIP silicone arthroplasty, the technique described is the dorsal approach. As far as we know, the role of the volar approach in PIP arthroplasty has still not been adequately assessed.

Objectives: To retrospectively review the patients who had PIP joint arthroplasty, and to study the clinical and radiographic outcomes in relation to the approach: volar or dorsal.

Methods: A total of 22 PIP joint replacements were performed between 2005 and 2010. The mean age was 56 years and the mean follow-up period was 29 months. The implant used in all patients was the Avanta[®] PIP Soft-Skeletal Implant (Avanta Orthopaedics, San Diego, USA). The dorsal approach was performed in 14 joints, and a volar approach in 8 joints. The preoperative clinical evaluation included a visual analog scale (VAS) and the range of motion (ROM). The preoperative ROM mean was $-15^{\circ}/60^{\circ}$ in both groups. The VAS and the ROM in the last follow-up visit were recorded and compared with preoperative values.

Results: The postoperative ROM of the dorsal approach group had a mean of $-15^{\circ}/60^{\circ}$, and that of the volar approach was $-2^{\circ}/62^{\circ}$.

Conclusion: It was found that the volar approach in this series offers the advantages of maintaining the integrity of the extensor mechanism, resulting in a complete restoration of the extension in the range of motion.

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[☆] Please cite this article as: Natera L, Moya-Gómez E, Lamas-Gómez C, Proubasta I. Artroplastia de la articulación interfalángica proximal: comparación entre el abordaje palmar y dorsal. Rev Esp Cir Ortop Traumatol. 2014;58:303–308.

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PALABRAS CLAVE

Artroplastia;
Interfalángica;
Abordaje;
Palmar;
Dorsal

Artroplastia de la articulación interfalángica proximal: comparación entre el abordaje palmar y dorsal**Resumen**

Introducción: La artropatía de las articulaciones interfalángicas proximales (AIP) cursa con síntomas muy restrictivos, siendo algunos casos tributarios de artroplastia. En la mayoría de las series de artroplastias de las AIP la técnica utilizada es a través de un abordaje dorsal. El papel del abordaje palmar en la artroplastia de las AIP todavía no se ha valorado suficientemente.

Objetivo: Revisar retrospectivamente los pacientes intervenidos de artroplastia de la AIP, y determinar si las realizadas por vía palmar consiguen un rango de extensión mayor que las realizadas por vía dorsal.

Pacientes y métodos: Entre 2005-2010 se realizaron 22 artroplastias de AIP. La media de seguimiento fue de 29 meses. El implante que se utilizó en todos los pacientes fue el implante de silicona de AIP modelo Avanta® (Avanta Orthopaedics, San Diego, California, EE. UU.). Se realizó un abordaje dorsal en 14 articulaciones y un abordaje palmar en 8. La valoración clínica preoperatoria incluyó la escala visual analógica (EVA) y el arco de movimiento. El arco de movimiento preoperatorio medio era de $-15^{\circ}/60^{\circ}$ en ambos grupos. En la última visita del seguimiento, la EVA y el rango de movimiento se registraron y se compararon con los valores preoperatorios.

Resultados: El arco medio de flexo-extensión postoperatorio del grupo del abordaje dorsal era de $-15^{\circ}/60^{\circ}$, y el del abordaje palmar de $-2^{\circ}/62^{\circ}$.

Conclusión: En nuestra serie hemos observado que las artroplastias de AIP realizadas por vía palmar consiguen un rango de extensión mayor que aquellas realizadas por vía dorsal. El abordaje palmar ofrece las ventajas de mantener la integridad del mecanismo extensor.

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Introduction

Proximal interphalangeal (PIP) joint arthropathy entails highly restrictive symptoms. Although many patients respond to conservative treatment, some cases require surgical treatment, even arthroplasty. The classical silicone implants introduced by Swanson in the 70s have demonstrated a significant reduction of pain and a discreet increase of the movement range.¹ Subsequently, surface arthroplasties were introduced, which used chromium-cobalt as the proximal component and high-molecular weight polyethylene as the distal component.² More recently, the use of implants with pyrolytic carbon components has been gaining acceptance.³⁻⁵ The results obtained both with the Swanson model and with more recent prostheses made of pyrolytic carbon are uniformly satisfactory.⁶⁻⁸ The PIP can be accessed through dorsal,² lateral⁸ and volar⁷ approaches. The most commonly employed technique in most published PIP arthroplasty series has been the dorsal approach.^{9,3} The most frequent cause of reinterventions in PIP arthroplasties is extensor apparatus dysfunction.¹⁰ The volar approach offers several theoretical advantages over the dorsal approach. It offers surgeons the possibility of avoiding incisions on the extensor apparatus and, therefore, does not entail prolonged postoperative immobilization, thus almost eliminating the possibility of postoperative adhesences and allowing rehabilitation to start almost immediately. The objective of this work was to retrospectively review patients undergoing PIP arthroplasty and to determine whether those conducted through a volar approach achieved a greater range of extension than those carried out through a dorsal approach.

Patients and methods

A total of 22 PIP arthroplasties were conducted on 17 patients between 2005 and 2010. Of these 14 were carried out through a dorsal approach and 8 through a volar approach. All the procedures were conducted by experienced surgeons from the Hand Surgery Unit of our center (C.L., I.P.).

The mean follow-up period was 29 months. The indications for surgery included pain with joint destruction and reduction of joint balance. The mean age was 56 years. Out of the total, 10 patients were female and 7 were male. The preoperative diagnosis was of primary osteoarthritis (PO) in 8 cases, rheumatoid arthritis (RA) in 4, post-traumatic osteoarthritis (PTO) in 3 and psoriatic arthritis (PA) in 2 cases. The operated fingers were the middle in 11 cases, the index in 6 and the ring finger in 5 cases. All cases were distributed by approach, type of pathology and number of arthroplasties as follows: dorsal approach 7 PO, 3 RA, 2 PTO and 2 PA, volar approach 4 PO, 2 RA, 1 PTO and 1 PA. The implant used in all cases was the Avanta® model (Avanta Orthopedics, San Diego, CA, USA). In the past, the dorsal approach was the usual technique to conduct PIP arthroplasties at our unit. Subsequently, we became aware of the extension deficit generated by such arthroplasties and decided to carry them out through a volar approach. At present, all PIP interventions conducted at our unit are performed through a volar approach. We decided to assess the functional results obtained with the last 8 PIP arthroplasties conducted through a volar approach with a minimum representative follow-up and compare them with those with a comparable minimum representative follow-up

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