



Original Article

APSI scaphoid hemiarthroplasty – long-term results[☆]

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ABSTRACT

Objective: This study is aimed at evaluating the long-term results of proximal scaphoid hemiarthroplasty for post-traumatic avascular necrosis at this institution.

Methods: Twelve patients who underwent this procedure were identified, and the mean follow-up time was 6.5 years (range: 5–8 years). All patients were male, with a mean age of 39 years (range: 28–55 years). In eight patients, the non-dominant limb was affected. The procedure was carried out through a dorsal approach and all patients underwent the same rehabilitation protocol. Cases were evaluated regarding complications, pain, range of motion, functional status (Mayo Wrist Score), and disability (QuickDASH Score).

Results: No immediate post-operative complications, such as infection or dislocation of the implant, were observed. All patients presented with peri-implant osteolysis at follow-up, on a radiograph study. None of the patients was forced to abandon their previous professional activity, although about 50% required some type of adaptation at their workplace. The mean functional capacity was, according to the Mayo Wrist Score, of 67.5 points (range: 50–80), corresponding to a satisfactory degree of function. The QuickDASH disability score presented a mean of 25 (range: 3–47.7).

Conclusion: The results of this series are in line with previously published studies about this technique. Hemiarthroplasty with a pyrocarbon implant is a safe technique for the treatment of post-fracture avascular necrosis of the scaphoid proximal pole. This technique allowed for satisfactory functional results at a mean follow-up of 6.5 years.

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Hemiarthroplastia do escafoide com APSI – resultados funcionais em longo prazo

RESUMO

Objetivo: Avaliar os resultados em longo prazo da hemiarthroplastia do escafoide proximal no tratamento da osteonecrose avascular pós-traumática na instituição.

Palavras-chave:

Hemiarthroplastia

[☆] Study conducted at Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal.

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Osso escafoide
Necrose
Punho

Métodos: Foram identificados 12 pacientes submetidos a esse procedimento. O tempo médio de seguimento foi de 6,5 anos (entre cinco e oito). Todos os pacientes eram do sexo masculino, com média de 39 anos (entre 28 e 55). Em oito pacientes o membro afetado foi o não dominante. O procedimento foi feito por meio de uma abordagem dorsal e todos os pacientes foram submetidos ao mesmo protocolo de reabilitação. Todos os casos foram avaliados quanto à ocorrência de complicações, dor, amplitude de movimento, capacidade funcional (*Mayo Wrist Score*) e incapacidade (*QuickDASH Score*).

Resultados: Não foram observadas complicações no período pós-operatório imediato, como infecção ou luxação do implante. No fim do período de seguimento, todos os casos apresentavam osteólise peri-implante no estudo radiográfico. Nenhum dos pacientes abandonou a sua atividade profissional prévia à cirurgia, embora em cerca de 50% dos casos tenha sido necessário algum tipo de adaptação no local de trabalho. A capacidade funcional média foi, de acordo com o *Mayo Wrist Score*, de 67,5 pontos (entre 50 e 80), correspondeu a um nível de função satisfatório. O escore de incapacidade *QuickDASH* apresentou uma pontuação média de 25 (entre 3 e 47,7).

Conclusão: Os resultados desta série encontram-se em linha com os estudos publicados sobre essa técnica. A hemiartroplastia do escafoide com implante de pirocarbono é uma técnica segura para o tratamento da necrose avascular do polo proximal do escafoide após fratura. Essa técnica permitiu obter um resultado funcional satisfatório após uma média de 6,5 anos de seguimento.

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Introduction

The scaphoid is the most commonly fractured carpal bone. It presents a complex three-dimensional anatomy and a precarious vascular supply, especially proximally.¹⁻⁵

The loss of bone continuity results in injury to the scaphoid vascularization and, consequently, impairs mechanism of resolution of the fracture.⁵ In proximal-third fractures, complete loss of vascularization of this segment can be observed in up to 40% of the cases, with osteonecrosis of the proximal segment.^{6,7}

Consolidation fracture at the scaphoid level generally progresses to osteoarthritis, according to the scaphoid nonunion advanced collapse (SNAC) pattern, with pain and functional disability at wrist level. There is no consensus on the treatment of these lesions.⁸⁻¹⁰

The surgical treatments classically indicated for the treatment of SNAC lesions are: partial resection of the scaphoid; proximal carpectomy; intracarpal arthrodesis (lunar-capitate-trapezium-trapezoid four-corner arthrodesis). These procedures present specific technical complications – scaphoid resection and proximal carpectomy are associated with an increased risk of progression to wrist osteoarthritis and decreased grip strength; in turn, arthrodesis procedures are associated with a decrease in the range of motion.¹¹⁻¹⁵

In more advanced cases, with generalized intercarpal and radiocarpal osteoarthritis, arthrodesis or total wrist arthroplasty may be indicated. Radiocarpal arthrodesis is associated with an important limitation in hand and wrist function. Total wrist arthroplasty is a technique without consistent results in the literature; short-term functional improvements have been observed, but long-term high rates of complications, such as aseptic detachment, have been observed.¹⁶⁻¹⁹

Partial or total scaphoid resection (proximal fragment) results in a collapse of the proximal row. Adaptive Proximal Scaphoid Implant (APSI – Tornier Cie., Montbonnot, Saint Martin, France) hemiarthroplasty uses a mobile pyrocarbon interposition implant to replace the proximal pole of the scaphoid. This technique aims at avoiding a proximal row collapse, maintain carpal kinematics during wrist movements, and minimize the evolution to carpal collapse and osteoarthritis.²⁰

Most studies published in the scientific literature on the use of this type of implant present only short-term results.²⁰⁻²³ The present study was aimed at evaluating the long-term results of interposition hemiarthroplasty of the scaphoid with a mobile pyrocarbon implant in the patients from this institution. The complications associated with the procedure, pain, range of motion, functional capacity, disability, and patient satisfaction with the procedure were assessed at the end of a mean follow-up time of 6.5 years.

Material and methods

Twelve cases of this type of hemiarthroplasty were retrieved at this institution. All patients were male, with a mean age of 39 years (range: 28–67 years).

In eight patients, the non-dominant side was affected. Of the 12 patients evaluated, eight performed professional activities with high physical and functional demands on the wrist.

Preoperative images were collected in all patients, from simple wrist radiographs to computed tomography and nuclear magnetic resonance when the attending surgeon deemed it necessary.

The biographic data and the classification of patients according to the SNAC degree (according to the classification proposed by Vender et al.⁸) observed in the initial radiographic

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