

ORIGINAL ARTICLE

**Scaphoid fractures treated with a volar percutaneous approach. Analysis and results in 92 cases** ☆



G. Luengo Alonso<sup>a,\*</sup>, V. Jiménez Díaz<sup>a</sup>, L. García Lamas<sup>a</sup>, M.A. Porrás Moreno<sup>a</sup>,  
D. Cecilia López<sup>a,b</sup>

<sup>a</sup> *Unidad Mano y Codo, Hospital Universitario 12 de Octubre, Madrid, Spain*

<sup>b</sup> *Universidad Complutense, Departamento de Cirugía, Madrid, Spain*

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**KEYWORDS**

Scaphoid fracture;  
Percutaneous  
fixation;  
Volar approach;  
Osteosynthesis

**Abstract**

*Objective:* Herbert type B1 and B2 scaphoid fractures can be treated by orthopaedic treatment or surgery. The aim of this study is to analyse results and complications of scaphoid waist fractures treated using the percutaneous volar approach.

*Material and method:* We present a retrospective study of 92 patients, treated in our institution from 2006 to 2016 using a volar percutaneous fixation. Mean Follow-up was 16 months (range 12–48). Injuries were classified using Hebert's classification, including B1 and B2 fracture types; the other fracture types following this classification system were excluded. Polytrauma patients, dorsal approach, fractures associated with distal radius injuries, patients treated using another surgical technique and patients with non follow-up were also excluded. Functional results were evaluated using the DASH questionnaire. Consolidation was established as the presence of bony bridges crossing the fracture site on X-rays, associated with absence of pain.

*Results:* The average time to fracture healing was 6.6 weeks (range 5–11). After 12 months of follow-up, the average wrist range of motion was 70° of extension (range 58–75) and 70° of flexion (range 62–80). Regarding functional evaluation, the average DASH questionnaire score was 42. The most frequent complication was non-union in 4 cases (4.44%). Average surgical time was 25 min.

*Conclusions:* Volar percutaneous fixation is a simple and quick technique for a specialist surgeon, characterised by low morbidity and complication rates compared to ORIF and orthopaedic treatment, which accelerates the patient's functional recovery.

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\* Corresponding author.

E-mail address: [gluenal@gmail.com](mailto:gluenal@gmail.com) (G. Luengo Alonso).

**PALABRAS CLAVE**

Fractura de  
escafoides;  
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Abordaje volar;  
Osteosíntesis

**Fracturas de escafoides tratadas con técnica percutánea volar. Análisis y resultados de 92 casos****Resumen**

**Objetivo:** Las fracturas de escafoides Herbert tipo B1 y B2 se pueden tratar tanto de manera ortopédica con inmovilización como de manera quirúrgica. El objetivo de este estudio es analizar los resultados clinicofuncionales y las complicaciones de las fracturas de escafoides tratadas con fijación percutánea mediante abordaje volar.

**Material y método:** Estudio retrospectivo de 92 pacientes, tratados en nuestro centro, entre 2006 y 2016, mediante fijación percutánea volar. Seguimiento medio de 16 meses (rango 12-48). La clasificación de las fracturas se realizó según la clasificación de Herbert, incluyendo los tipos de fractura B1 y B2. El resto de los tipos fueron excluidos. Se excluyeron a los pacientes politraumatizados y los abordajes dorsales, las fracturas asociadas a fracturas de radio y a los pacientes sin seguimiento. Los resultados funcionales se evaluaron utilizando el cuestionario DASH. El criterio de consolidación se estableció con ausencia de dolor en el examen físico y presencia de consolidación en las proyecciones radiográficas.

**Resultados:** El tiempo medio para la consolidación fue de 6,6 semanas (rango 5-11). A los 12 meses de seguimiento, el rango promedio de movimiento fue 65° de extensión (rango 58-75) y 75° de flexión (rango 72-80). Obtuvimos una media de 42 puntos según el cuestionario DASH. La complicación más frecuente fue la pseudoartrosis en 4 casos (4,4%). El tiempo de cirugía medio fue de 25 min.

**Conclusiones:** La fijación percutánea volar es una técnica simple y rápida para un cirujano especializado, caracterizada por bajas tasas de morbilidad y complicaciones, en comparación con otras técnicas. Permite acortar el tiempo de convalecencia y acelera la recuperación funcional del paciente, aparte de ser coste-efectiva.

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**Introduction**

Scaphoid fractures are the most common carpal fracture and account for almost 60% of all of them.<sup>1</sup> The incidence of these fractures varies depending on the references that are consulted, from 22 to 141 per 100,000 individuals per year in the European population.<sup>1-5</sup>

In spite of their frequent occurrence, these fractures are always a challenge for diagnosis as well as treatment. Early diagnosis and appropriate treatment are necessary to prevent kinetic alterations in the wrist, together with the feared early onset arthritis that is associated with incorrect consolidations or pseudoarthritis.<sup>6-9</sup>

The aim of this study is to analyse our clinical-functional results in the treatment of Herbert B1-B2 carpal scaphoid fractures using percutaneous surgery with a volar percutaneous approach, as well as to evaluate the radiological and functional results of the same 12 months after surgery. All of this forms the basis of a preliminary study.<sup>10</sup>

**Material and method**

A retrospective study was undertaken of a total of 129 consecutive cases of carpal scaphoid fractures treated in our hospital. The study covers the period from January 2006 to January 2016. A series of inclusion criteria were established: fractures that occurred from 2006 to 2016, B1-B2 type fractures according to Herbert's classification, i.e., transverse

or short oblique fractures, ones treated using percutaneous volar surgery, and lastly treatment of the fracture within the first 12 days. Exclusion criteria were also set: any other type of fracture classification, fractures associated with fractures of the distal third of the radius, ones treated using any other kind of approach, patients with multiple trauma and lastly, those who were not followed up or when this took place earlier than 12 months, or when they were followed-up in other hospitals.

Of the 129 cases, 19 patients had multiple trauma and 7 had types of fracture other than the B1-B2 types in Herbert's classification, and in 6 cases treatment occurred after the 12 day limit. In 5 cases the requisite follow-up was lacking. This left 92 cases of scaphoid fracture in 92 patients (Fig. 1).

Demographic data were recorded, together with the injury mechanism, associated lesions and postoperative complications in the final group of patients. Of the 92 patients, 80 were men and 12 were women, with an average age of almost 27 years old. The B1 type of fracture was the most frequent, at 63 cases, as opposed to 29 B2 fractures. The average follow-up in our sample was 16 months, with a range of from 12 to 48 months.

**Protocol for action in carpal scaphoid fractures**

Apart from physical examination, when there is the suspicion of carpal scaphoid fracture a series of radiological images

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