

# XXII

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SECM  
MURCIA  
6, 7 Y 8 MAYO 2015

## Que nos aporta la artroscopia en las fracturas intrarticulares del radio distal, análisis de 30 casos.

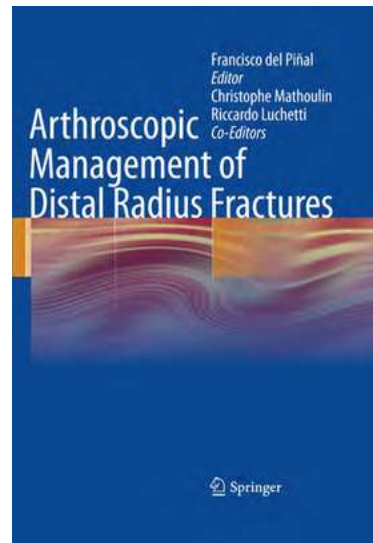
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# Introducción y objetivos:

- La artroscopia de muñeca como técnica de ayuda en el tratamiento de las fracturas del radio distal, se esta haciendo cada vez mas frecuente, nos permite no solo evaluar la reducción de la fractura y la presencia de lesiones asociadas, si no que es útil para mejorar la reducción y tratar lesiones asociadas.



It is pertinent to stress at this point that the arthroscope is just a tool to improve reduction, and expertise in the management of distal radius fractures with the classic techniques is more important than the arthroscopic part itself. The maxim is, "classics first and then innovation" – ignoring this will inevitably lead to unwanted problems and bad results.

If you are yet not convinced that the scope is *the* tool, as a simple exercise I recommend you to insert an arthroscope inside a joint with a fracture that fluoroscopically *seems* to be reduced. Who knows? You may just change your mind, and find this book useful. After all "seeing is believing," as Marc Garcia-Elias writes in the Foreword.



# Introducción y objetivos:



- La artroscopia de muñeca nos permite evaluar de forma mas precisa que el fluoroscopio la correcta reducción de la fractura.
  - “The number of fracture lines and presence of step and gap deformity can be adequately assessed using clinical and fluoroscopic assessment. However, the magnitude of step and gap deformity may be underestimated.”



Edwards CC. Intra-articular distal radius fractures: arthroscopic assessment of radiographically assisted reduction. J Hand Surg. 2001;26A:1036-41.

ORIGINAL ARTICLE

### Arthroscopic Assessment of Intra-Articular Distal Radius Fractures After Open Reduction and Internal Fixation From a Volar Approach

Kevin Lantz, MD, Martin I. Bovee, MD, Joseph A. Stofko, DR, Charles A. Goldfarb, MD

**Purpose:** The objective of this study was to assess the accuracy of intra-articular distal radius fractures after open reduction and internal fixation (ORIF) using a volar approach. The purpose of this study was to determine if the use of arthroscopy after ORIF of distal radius fractures could be used to assess the accuracy of the reduction and internal fixation. The purpose of this study was to determine if the use of arthroscopy after ORIF of distal radius fractures could be used to assess the accuracy of the reduction and internal fixation.

**Methods:** Seven patients with intra-articular distal radius fractures who had undergone ORIF through a volar approach and internal fixation were included in this study. The patients were followed up for a minimum of 6 months. The patients were followed up for a minimum of 6 months. The patients were followed up for a minimum of 6 months.

**Results:** The mean age of the patients was 55 years. The mean time from injury to surgery was 12 months. The mean time from surgery to follow-up was 18 months. The mean time from surgery to follow-up was 18 months. The mean time from surgery to follow-up was 18 months.

**Conclusion:** The use of arthroscopy after ORIF of distal radius fractures can be used to assess the accuracy of the reduction and internal fixation. The use of arthroscopy after ORIF of distal radius fractures can be used to assess the accuracy of the reduction and internal fixation.

**Types of study/level of evidence:** Diagnostic

**Keywords:** Arthroscopy, distal radius fractures, reduction, internal fixation

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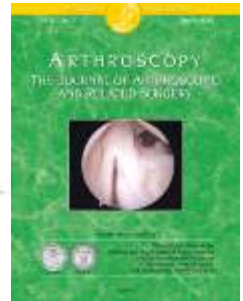
**Keywords:** Arthroscopy, distal radius fractures, reduction, internal fixation



# Introducción y objetivos:



- Mejores resultados funcionales
  - “AA reduction and fixation of intra-articular distal radius fractures permits a more thorough inspection of the ulnar-sided components of the injury. At follow-up evaluation, patients who underwent AA procedures had a greater degree of supination, flexion, and extension than patients undergoing FA surgery.”



## Arthroscopic Reduction Versus Fluoroscopic Reduction in the Management of Intra-articular Distal Radius Fractures

David S. Rock, M.D., Jeff Valke, M.A., Gary G. Peshlag, M.D., Beth Parsons Smith, Ph.D., and Gary R. Kuzma, M.D.

**Purpose:** Although arthroscopy offers an unparalleled view of intra-articular pathology, its use in the treatment of intra-articular distal radius fractures remains controversial. This study was designed to compare functional and radiologic outcomes of arthroscopically assisted (AA) versus fluoroscopically assisted (FA) reduction and internal fixation of distal radius fractures. **Types of Study:** Retrospective, case-matched comparison of 2 different procedures. **Methods:** Between January 1995 and December 1999, 13 patients with comminuted intra-articular distal radius fractures underwent AA external fixation and percutaneous pinning. Fifteen patients underwent external fixation and FA reduction and pinning. Patients in both groups were matched for fracture pattern and age. **Results:** Follow-up evaluation consisted of an evaluation of grip strength and range of motion, as well as radiographic evaluation of palmar tilt, radial shortening, ulnar tilt, and degenerative changes. Health-related quality of life outcomes were assessed using the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire. Patients who underwent AA surgery had significantly improved supination compared with those who underwent FA surgery ( $P = .01$ ,  $P = .02$ ). AA reduction also resulted in improved ulnar extension (mean,  $71^\circ \pm 69^\circ$ ;  $P = .01$ ) and wrist flexion (mean,  $38^\circ \pm 59^\circ$ ;  $P = .02$ ). Radiol shortening, ulnar tilt, and ulnar variance angles, and DASH scores were similar for both groups. **Conclusions:** AA reduction and fixation of intra-articular distal radius fractures permits a more thorough inspection of the ulnar-sided components of the injury. At follow-up evaluation, patients who underwent AA procedures had a greater degree of supination, flexion, and extension than patients undergoing FA surgery. **Level of Evidence:** Level II, prospective cohort study. **Key Words:** Arthroscopy—arthroscopic reduction—fluoroscopic reduction—distal radius fractures—distal radius.

Arthroscopically assisted (AA) reduction and fixation has been proposed for the management of intra-articular fractures of the tibia, femur, glenoid, scapula, wrist, and ankle.<sup>1-12</sup> Potential advantages of the arthroscopic technique include (1) superior visualization of the articular surface of the fracture,<sup>13</sup>

identification and potential treatment of ligamentous and chondral lesions, and (2) reduced morbidity associated with arthroscopy procedures compared with arthroscopy procedures. Outcomes of arthroscopic management of distal radius fractures have been reported to provide superior reduction when compared with fluoroscopic management in both retrospective and prospective studies.<sup>14-16</sup> Despite these reports, controversy remains regarding whether or not AA reduction and fixation provides superior outcomes compared with traditional reduction and fixation using fluoroscopy. The specific goal of this study involving patients with intra-articular distal radius fractures was to evaluate whether or not AA reduction and reduction provided superior outcomes compared with fluoroscopically assisted (FA) fixation and reduction.

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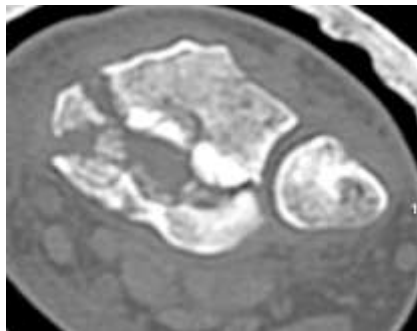
Address correspondence and reprint requests to David S. Rock, M.D., Department of Orthopaedic Surgery, Wake Forest University School of Medicine, Medical Center Blvd, Winston-Salem, NC 27157-1070. E-mail: drs@wakehealth.edu  
© 2004 by the Arthroscopy Association of North America  
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doi:10.1054/jars.2004.07.019

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 30, No 4 (March) 2004, pp 313-318 315



# Material y métodos:

- Hemos revisado 30 fracturas intrarticulares de radio distal tratadas mediante osteosíntesis con placa volar en 28 casos y tornillos canulados en 2 .



5



## Technical Tips for (Dry) Arthroscopic Reduction and Internal Fixation of Distal Radius Fractures

Francisco del Pino, MD, Dr Med

Contrary to general belief, arthroscopic assisted reduction in distal radius fractures can be done in an expeditious manner and with minimal consumption of operating room resources. This article presents the steps for a pleasant arthroscopic experience in detail. The technique proposed combines the benefits of rigid fixation with volar locking plates (for the extra-articular component) and arthroscopic control of the reduction (for the articular component). It is important that the operation be carried out using the dry arthroscopic technique. However, arthroscopy is just an addition to conventional methods. Thorough knowledge of and facility with classic techniques of distal radius fracture treatment is essential for a good result. *J Hand Surg 2011, 36A: 1984-1992. Copyright © 2011 by the American Society for Surgery of the Hand. All rights reserved.*

**Key words:** Wrist arthroscopy, distal radius fracture, intra-articular fracture, volar locking plate

**R**EDUCING THE RISK necessary to the main goal after an articular distal radius fracture, and arthroscopy has some inherent inaccuracy.<sup>1-4</sup> On the other hand, the arthroscopic allows us to see inside the joint with light and magnification. Nevertheless, despite well-potential comparative published studies<sup>5-9</sup> that support the use of the arthroscope when dealing with articular distal radius fractures, there is general resistance to use the arthroscope.<sup>7</sup> This is sometimes justified as resulting from a small risk of compartment syndrome, or the fact that it is time- and resource-consuming. The unconvincing reason, however, lies in the technical difficulties and cumbersome of combining the classic (wet) wrist arthroscopy with the open reduction and internal fixation part itself. On the one hand, massive tissue infiltration makes the latter extremely awkward, or the other hand, worse

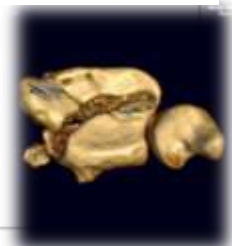
resulting out through the incisions and portals obliges us to combine the less effective Kirschner-wire and external fixation methods,<sup>10,11,12</sup> limiting the use of the more stable volar-locking plate<sup>13,14</sup> when arthroscopy is used.

Arthroscopy without distending the joint with water (so-called "dry" arthroscopy)<sup>15</sup> has many advantages over the wet (classic) technique but is practiced by few surgeons.<sup>16,17</sup> This is understandable because, as a principle, one avoids changing an efficient and familiar technique for another that seems to add no benefit. Yet, there is no other single field in wrist arthroscopy where the dry technique can make such a huge difference and ease the procedure, compared with the wet technique, as when dealing with articular fractures of the wrist. Dry arthroscopy permits an unimpeded contribution between the open fixation part and the possibility of watching the cartilaginous reduction and any associated soft tissue injury.

The purpose of this article is to present technical tips for using the arthroscope when dealing with distal radius fractures. Because it is important to be acquainted with the dry technique, the first part of this report is devoted to familiarizing the reader with its intricacies, and the second part is the fracture treatment itself.

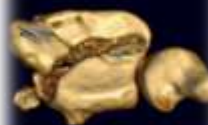
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Corresponding author: Francisco del Pino, MD, Dr Med, Instituto de la Mano, Facultad 3, 28002 Sevilla, Spain (e-mail: fdel@instituto.com).  
DOI: 10.1016/j.jhsa.2011.05.008  
0368-8464/11/3612-1984-09\$36.00/0

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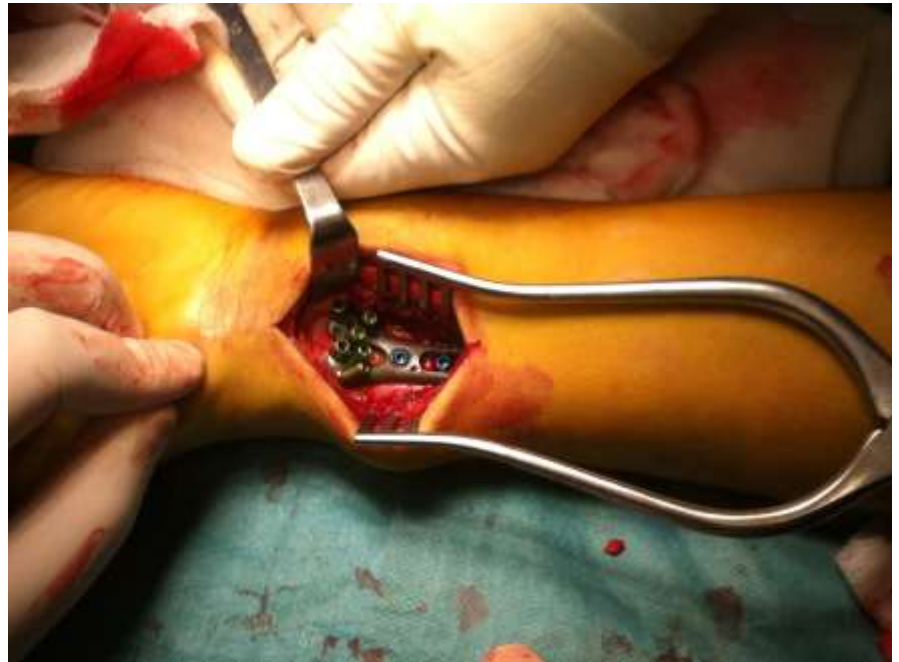
# Material y método:

- 30 pacientes:
  - Edad media de 47 años, (22-70).
  - 18 varones, 12 mujeres.
  - 17 derecho, 13 izquierdo.
  - El tiempo medio desde la fractura a la cirugía es de 8,6 días, (3-19).



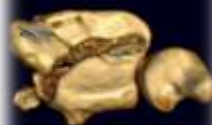
# Material y método:

- Técnica quirúrgica:
  - Anestesia por bloqueo axilar.
  - Isquemia preventiva.
  - Abordaje anterior del FCR.
  - Reducción y síntesis con placa volar, control escopia, fijación proximal definitiva.
  - Fijación epifisaria
    - Tornillos
    - Bulon
    - Aguja de K.



# Material y método:

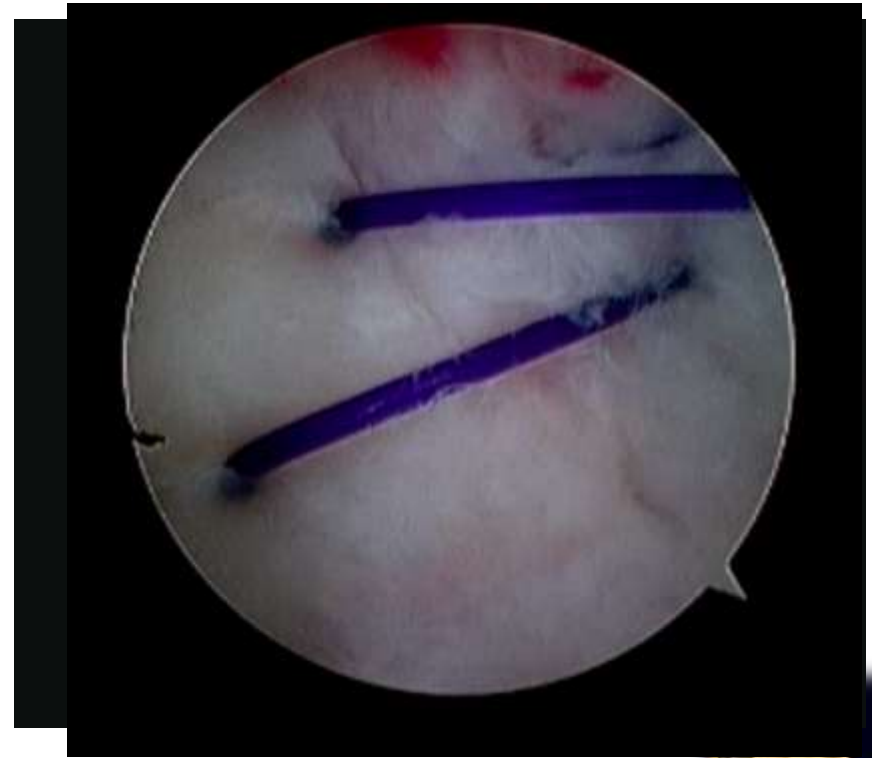
- Técnica quirúrgica:
  - Artroscopia de muñeca.
    - Torre de tracción AWT.
    - Artroscopia seca.
    - Revisión radiocarpiana.
    - Mediocarpiana.
  - Gestos artroscópicos.
  - Fijación definitiva.
  - Cierre de la herida.
  - Tiempo medio de la cirugía de 67 minutos. (42 - 87)





# Resultados:

- Hemos evidenciado lesiones del FTCC en 13/30,
  - 2 reinserciones por inestabilidad RCD.
  - 2 suturas a capsula, por lesiones periféricas.
  - 4 desbridamientos lesiones centrales.
  - 5 no tratamiento, 2 lesiones radiales, 3 periféricas pequeñas.



# Resultados:

- Lesiones EL en 9/30:
  - 2 completas asociadas a 2 fracturas de estiloides.
  - 2 tipo III de Geissler,
  - 2 tipo II.
  - 3 tipo I.
  - lesiones LP en 2/30.

Arthroscopic stage (EWAS)
I
II lesion of membranous SL
II A partial lesion (involving)
II B partial lesion (involving)
II C complete SLCC tear, jr
IV complete SLGrowth St. gr
V



ARTICLE IN PRESS  
SCIENTIFIC ARTICLE

## Arthroscopically Diagnosed Scapholunate Ligament Injuries Associated With Distal Radial Fractures: A 13- to 15-Year Follow-Up

Asa Månberg, MD, Tommy Lindén, MD, PhD, Mats Geijer, MD, PhD, Magnus Tzipt, MD, PhD

**Purpose** To evaluate the natural history of untreated complete or partial scapholunate (SL) ligament tears associated with displaced distal radial fractures.

**Methods** Between 1995 and 1997, 31 consecutive patients aged < 80 years with displaced distal radial fractures were examined arthroscopically to assess for concomitant soft tissue injuries. Thirty-one of 31 patients had an SL ligament tear, 10 had a complete tear (Lundén grade 3), and 21 had a partial tear (Lundén grades 1 and 2). Thirty-two patients had AO type C fractures, 3 had type-B fractures, and 16 had type-A fractures. In 2010, 47 of the 31 patients were still alive, and they were invited for an interview, clinical examination, and radiography.

**Results** Thirty-eight of the 31 original patients participated in the long-term follow-up. Mean grip strength was 83% relative to the contralateral hand in patients with a complete tear, as compared with 92% in patients with partial or no SL tears (nonsignificant). Median Disabilities of the Arm, Shoulder, and Hand questionnaire score was 2 (range, 0–53) for complete SL tears, compared with 9 (range, 0–70) for the others (nonsignificant). No differences were found regarding visual analog scale pain or wrist motion/function ratings. None of the patients developed a static SL dissociation or a SL-advanced collapse wrist.

**Conclusions** No major differences were found in the subjective, objective, or radiographic outcome after a complete (grade 3) or partial (grade 1 or 2) SL untreated tear associated with displaced distal radial fractures. It should be noted that none of the patients had a grade 4 SL tear, which may have a different outcome. *J Hand Surg Am.* 2017; 42(11):2111–2117. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.

**Key words:** distal radius fracture, scapholunate ligament.

**L**igamentous injuries are common in distal radius fractures (DRFs).<sup>1</sup> Apart from triangular fibrocartilage complex injuries, scapholunate (SL) ligament injuries are the most common.<sup>2</sup> The SL ligament

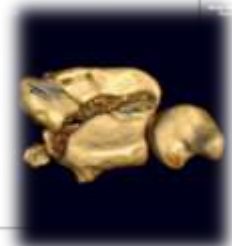
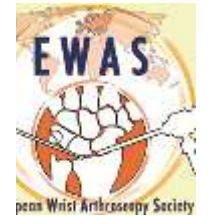
is an essential structure of the intercarpal wrist segments,<sup>3–5</sup> and tears may lead to a change in the carpal kinematics and secondary degenerative changes.<sup>6,7</sup> There is no consensus regarding whether or not these injuries should be treated surgically at the time of fracture.<sup>8</sup>

A DRF with an SL ligament injury induces a high-energy injury.<sup>9,10</sup> According to Mayfield,<sup>11</sup> an isolated SL ligament injury can be classified as a stage of progressive periwrist instability. By analogy, in some DRFs, the energy that strikes the wrist at impact and causes the fracture may also involve the soft tissues.

We report a prospective, long-term follow-up of patients who sustained DRFs in the period 1995–1997, and who, apart from fracture treatment, also had

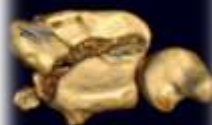
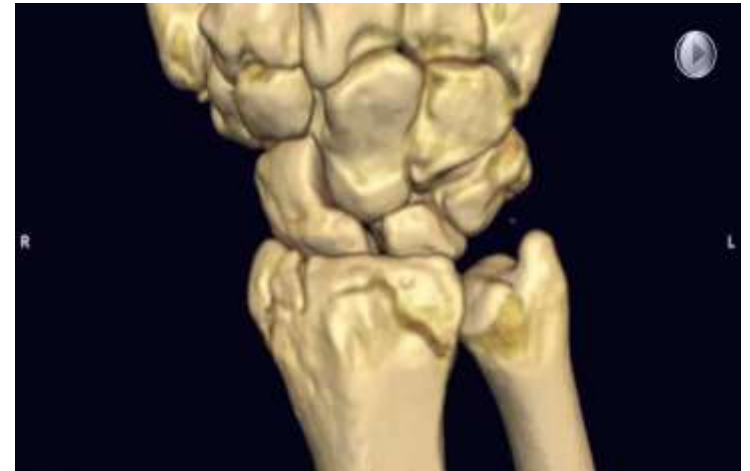
From the Department of Hand Surgery and Orthopedics, and the Units of Medical Statistics and Biomechanics, Lund University, Lund, Sweden, and Lund University Hospital, Malmö, and University Hospital, Århus, Denmark. Received for publication March 31, 2017; accepted for publication June 16, 2017. The authors thank the staff of the hand surgery department for their assistance in the conduct of the study. Copyright © 2017 Wolters Kluwer Health | Lippincott Williams & Wilkins. DOI: 10.1097/JHS.0000000000000510

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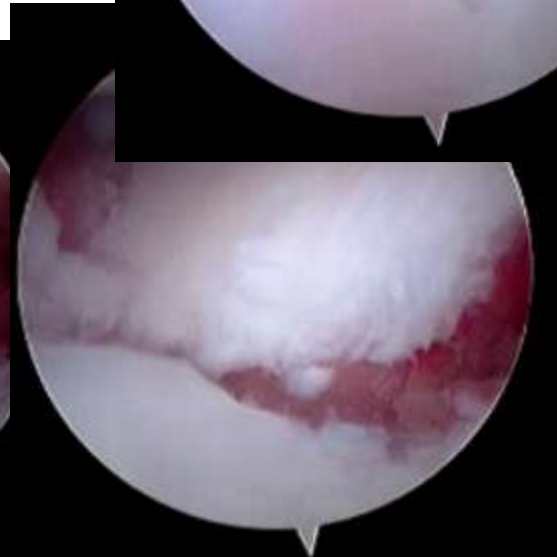
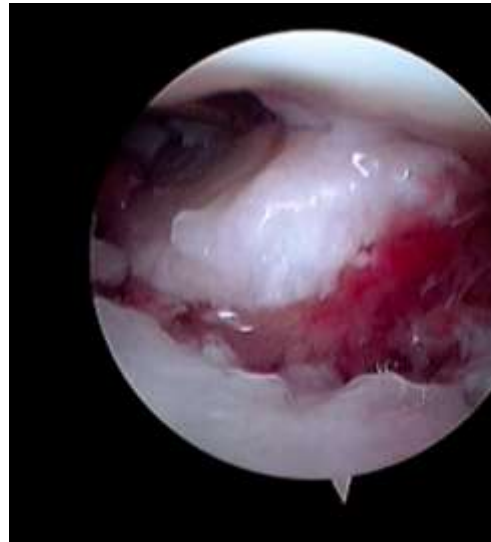
# Resultados:

- En 4 casos no se estabilizaron los fragmentos epifisarios antes de la artroscopia
  - 2 fracturas de estiloides.
  - 2 hundimientos tipo Die-punch.



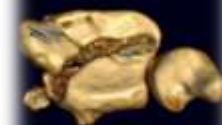
# Resultados:

- Fue necesario modificar la reducción obtenida mediante control fluoroscópico, tras la artroscopia en 6 casos.
- El tiempo medio de la cirugía fue de 66 minutos (42-87).



# Resultados:

- Se han realizado reintervenciones:
  - En los 6 pacientes que se trataron con agujas de K las lesiones ligamentosas.
  - 1 paciente precisó la liberación del canal carpiano a las 6 semanas de la cirugía inicial y posteriormente a los 9 meses se le retiró el material de síntesis.



# Discusión:

- El tiempo medio de la cirugía fue de 66 minutos (42-87).
- **Desventajas:**
  - Tiempo prolongado de cirugía.
  - Mas recursos (fluoroscopio, torre de artroscopia)
  - Experiencia del cirujano
  - Extravasación y síndrome compartimental.
- **Ventajas:**
  - Visión directa de la articulación.
  - Valoración de lesiones acompañantes.
  - Descartar tornillos intrarticulares
  - Lavado del hematoma
  - Artroscopia seca evita extravasación



EVIDENCE-BASED MEDICINE

### Intra-Articular Fracture of the Distal Radius: Arthroscopic-Assisted Reduction

Gaetano Herzberg, MD, FRC<sup>1</sup>

**THE PATIENT**  
A 25-year-old man has an isolated, displaced articular fracture of the distal radius after a fall from a bicycle. Neurovascular examination is normal. Initial radiographs and computed tomography show dorsal displacement, ulnar positive variance, and a displaced articular fracture between the scaphoid and lunate facets. There is no impingement of the articular surface or the metaphysis.

**THE QUESTION**  
Is arthroscopic visualization of the articular surface useful for such a fracture?

**CURRENT OPINION**  
There is consensus that an active, healthy patient with a displaced articular fracture of the distal radius will benefit from surgical treatment,<sup>1</sup> but there is no consensus on the preferred method of reduction and fixation.<sup>2</sup> There are advocates of closed reduction and percutaneous pinning, either extra-focal<sup>3</sup> or intra-focal,<sup>4</sup> including external fixator with or without supplemental K-wire fixation,<sup>5,6</sup> dorsal plating,<sup>7,8</sup> ligament-specific fixation<sup>9-11</sup>, and—particularly popular now—open reduction and internal fixation with a volar plate<sup>12</sup> through a classic Henry approach.

The advocates of arthroscopic-assisted reduction cite advantages such as direct visualization and reduction of articular displacement, the opportunity to diagnose and treat associated ligamentous injuries, removal of articular cartilage debris, and lavage of the radiocarpal joint.<sup>13-15</sup> Arthroscopic reduction is less invasive than open reduction of articular fragments of the distal radius. Open visualization of the articular surface is achievable only through a dorsal exposure, and it can destabilize and perhaps devitalize the fracture fragments. At present, arthroscopic-assisted reduction is not widely used, perhaps because (1) many surgeons are not facile with the arthroscope, (2) there are concerns about compartment syndrome or acute carpal tunnel syndrome with fluid extravasation, and (3) some believe that the reduction on image intensification is adequate.

**THE EVIDENCE**  
In 1996, Kink and Jupter<sup>16</sup> reported that radiocarpal arthritis at an average 6.7 years after an articular fracture of the distal radius correlated with articular step-off of more than 2 mm and was the most important determination of an unsatisfactory result using the Gerhart and Weeber rating. However, the number of patients was small, and the methodology was insufficient compared to the current standards.<sup>17</sup> Other studies corroborated this finding, such as one that examined 45 patients aged 17 to 79 years with C2 and C3 Association for the Study of Internal Fixation-type distal radius fractures and found that the degree to which articular step-off and gap between fragments were improved by surgery was strongly correlated with improved outcome.<sup>18</sup> On the other hand, Catalano<sup>19</sup> and Goldberg<sup>20</sup> showed that short- and long-term functional outcomes did not correlate with the magnitude of the residual step-off and gap displacement, with the caveat that—in contrast to Kink and Jupter—most of these patients had good restoration of extra-articular alignment with surgical treatment, and few had major articular incongruities.

A few studies suggest that arthroscopic monitoring of articular alignment is superior to image intensification alone.<sup>21-23</sup> One randomized, prospective study reported that arthroscopy led to better modified Mayo wrist scores, wrist and forearm motion, and radiographic alignment—but not Disabilities of the Arm, Shoulder, and Hand scores—2 years after injury.<sup>24</sup> An earlier prospective study, in which patients were treated by a single surgeon but randomized according to im-

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# Discusión:

- Lesiones acompañantes.
  - 13/30 FTCC.
  - 9/30 EL.
  - 2/30 LP.



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**Tabla 1 – Fracturas de la extremidad distal del radio. Incidencia de lesiones asociadas diagnosticadas por artroscopia**

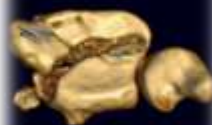
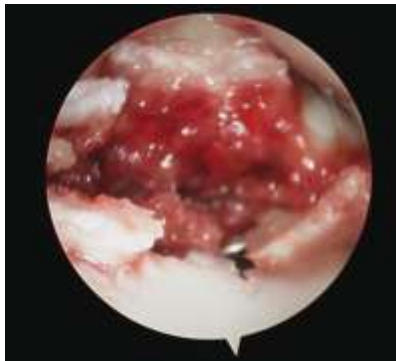
Autor (año)	N.º de FEDR (tipo)	% de lesión del CFCT	% de lesión del LEL	% de lesión del LLT
Geissler et al. <sup>22</sup> , 1996	60 (IA)	49	32	15
Lindau et al. <sup>16</sup> , 2000	50 (IA + EA)	78	54	16
Mehta et al. <sup>18</sup> , 2000	31 (IA)	58	85	61
Shih et al. <sup>23</sup> , 2001	33 (IA)	54	18	12
Mathoulin et al. <sup>24</sup> , 2001	27 (IA)	26	37	15
Hanker et al. <sup>15</sup> , 2001	173 (IA)	61	8	12
Khanchandani y Badia <sup>25</sup> , 2013	27 (IA)	63	29	4

CFCT: complejo fibrocartilago triangular; EA: extraarticular; IA: intraarticular; LEL: ligamento escafolunar; LLT: ligamento lunotriquetal.



# Conclusión:

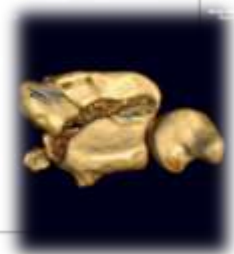
- La artroscopia de muñeca nos permite evaluar la correcta reducción de las fracturas articulares, las lesiones ligamentosas acompañantes.
- Se han tratado algunas lesiones ligamentosas.
- Podemos mejorar la reducción obtenida con control fluoroscópico.





# Conclusión:

- Creemos que nos es muy útil para evaluar aquellas fracturas que pueden movilizarse de forma precoz y retrasando la movilización en aquellas que presenta lesiones acompañantes aunque no actuemos directamente sobre ellas.
- Control de la síntesis.



**gracias**

