International Journal of Research in Medical Sciences
Santos LG et al. Int J Res Med Sci. 2024 Oct;12(10):3904-3906
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20242959

Case Report

Scapholunate advanced collapse as a complication of a chronic scaphoid fracture

Leonardo González Santos[1]*, Rodrigo E. Ferrero[2], Ana L. Pérez[2], Amador Jiménez[2], Sergio Sandoval[2], Elizabeth D. Rodríguez[2]

[1]Department of Surgery, Naval Medical Center, Mexico City, Mexico.
[2]Department of Plastic Surgery, Regional Hospital Lic. Adolfo López Mateos, Mexico City, Mexico

Received: 12 September 2024
Accepted: 25 September 2024

***Correspondence:**
Dr. Leonardo González Santos,
E-mail: leosantos.glez@gmail.com

ABSTRACT

Advanced scapholunate collapse (SLAC) is a common cause of wrist osteoarthritis. Watson HK and Ballet FL described SLAC injuries in 1984. They concluded that the incompetence of the scapholunate ligament led to a sequence of degenerative changes in the radio scaphoid junction in early stages and later in the Midcarpal joint, including a pan carpal injury. We describe the case of a male with an old scaphoid bone fracture and scapholunate collapse. Several treatment options are considered. However, the decision between performing a proximal carpectomy or total arthrodesis depends on several factors, including clinical evaluation and imaging studies. This clinical case, we performed a proximal carpectomy with favorable results at functional and aesthetic level.

Keywords: Collapse, Carpectomy, Scapholunate

INTRODUCTION

Advance scapholunate collapse accounts for 72% of cases of wrist osteoarthritis.[1] The SLAC wrist is the result of a scapholunate interosseus ligament (SLIL) injury. Causes include traumatic and non-traumatic factors. The injury is the result of a lack of union of scaphoid fracture. It may remain asymptomatic and undiagnosed for long periods, associated with a failure rate of 88%.[2] The images begin with standard posteroanterior, lateral wrist X-ray and bilateral comparative projections with a clenched fist that may reveal a deformity due to instability of the dorsal intercalated segment (DISI) with a relative widening of the scapholunate interval on the affected side.[3,4]

Pathophysiology

The SLIL is the primary stabilizer between the scaphoid and the semilunar, so damage produces the SLAC wrist. Non-traumatic causes include rheumatoid arthritis, dehydrated calcium pyrophosphate deposition disease, neuropathic disease or amyloid deposition disease. The main factor of traumatic cause is the rupture of SLIL as a result of a fall on the hyperextended wrist.[5] If not treated, a gradual clinical and structural deterioration occurs due to progressive injury of the periscaphoid ligament and secondary degenerative arthritis of the radioscaphoid joint, carpal collapse and midcarpal arthritis.[2]

CASE REPORT

A 66-year-old male patient with a history of systemic arterial hypertension and chronic obstructive pulmonary disease in control, states that approximately 6 months ago he suffered blunt trauma to his left hand when carrying a 30-gram object, subsequently presenting edema, pain and functional limitation. He was evaluated and sent home with oral analgesics. Without improvement, he went to the plastic surgery service where the physical

examination showed spasm and pain in the dorsal region and metacarpal base of the left hand, arcs of movement in ipsilateral wrist extension 80°/20°, flexion 80°/34°, cubital deviation 34°/6°, radial deviation 32°/10°, flexion limited interphalangeal joints. Imagine simple studies show proximal level fracture trace of the scaphoid (Figure 1). And tomography shows a large bone collapse on the semilunar, subluxation of the semilunar (Figure 2). Treatment started with hyaluronic acid infiltration, without improvement, so proximal carpectomy was chosen as the definitive treatment, with acceptable results both in esthetics and function (Figure 3).

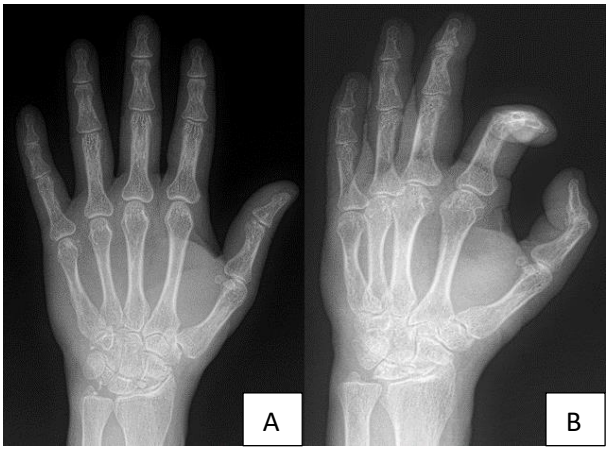

Figure 1: Initial anteroposterior (A) and oblique (B) radiograph showing bone continuity solution in the ecaphoid of left hand.

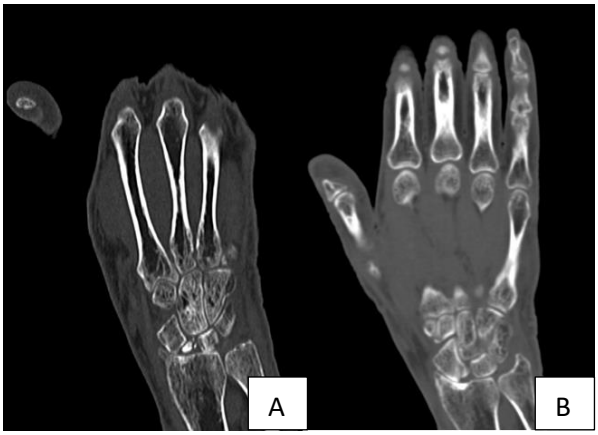

Figure 2: Computerized axial tomography of the left hand showing subluxation (A) and collapse (B) of the semilunar.

Classification

The SLAC of the wrist will have an osteoarthritis pattern that shows the progression of the injury. Watson and Ballet originally devised the 3-stage SLAC classification. Localized osteoarthritis of the scaphoid fossa begins at the styloid tip (radial styloid peak), indicative of Stage I SLAC of the wrist.[6] Progressive narrowing of the joint space and sclerosis affecting the entire scaphoid fossa of the distal radius is indicative of Stage II SLAC of the wrist. Stage III SLAC of the wrist involves sclerosis and narrowing of the joint space between the lunate and lunate. Finally, the large one will migrate proximally into the space created by scapholunate dissociation.[7,8]

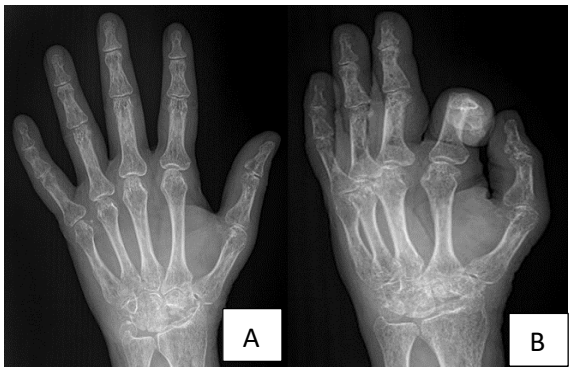

Figure 3: Anteroposterior (A) and oblique (B) radiograph of the left hand 3 months after proximal carpectomy.

DISCUSSION

A cause of wrist osteoarthritis is the incompetence of scapholunate ligament that led to a sequence of degenerative changes at the radio scaphoid junction in early stages (I and II) and later the mind carpal joint (stage III).[5] Treatment depends on the clinical status of the patient, starting with non-invasive management until the surgical approach, of which total arthrodesis and proximal carpectomy. Arthrodesis involves the fusion of the bones of the wrist with the aim of achieving a stable wrist with a powerful and painless grip, at the cost of compromising mobility.

It is indicated in cases of advanced osteoarthritis of the wrist, as sequelae of joint fractures or serious ligamentous injuries, the technique of choice being the placement of an osteosynthesis plate.[9] In contrast, according to Aravinthan et al, proximal row carpectomy is a surgical technique that preserves motion. The above is achieved with the excision of the bones of the entire proximal row of the carpus (scaphoid, lunate and pyramidal), which allows the proximal pole of the capitate to articulate with the semilunar fossa of the radius.[10] In the case of our patient, due to the integrity of the chondral surfaces of the semilunar fossa of the radius and the proximal pole of the capitate, fusion of the 4 corners was successfully performed, which is usually one of the main limitations.

As reported by Vazquez et al. in a study from January 2010 to 2015 where pre- and postoperative pain was evaluated using the visual analogue scale and the Quick-DASH satisfaction scale where 71 patients were evaluated, 65 had no complications and were satisfied with the procedure and only 2 showed persistence of

pain.[11,12] Our patient was able to return to his activities 2 months after surgery and is currently pain-free.

CONCLUSION

Advanced scapholunate collapse is a pathology with multiple causes; it is imperative to suspect in patients who have suffered a contusion or fall on the wrist and has pain and limited mobility persist over time. Although there are different treatment options, they should be chosen according to their needs.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Kale NN, Foote J, Medvedev G. Use of wrist denervation in the treatment of SLAC and SNAC wrist by ASSH members. J Wrist Surg. 2022;12(03):280-6.
2. Andronic O, Nagy L, Burkhard MD, Casari FA, Karczewski D, Kriechling P, et al. Long-term outcomes of the four-corner fusion of the wrist: A systematic review. World J Orthopedics. 2022;13(1):112-21.
3. Lane R, Tafti D, Varacallo M. Scapholunate advanced collapse. Stat Pearls. 2024.
4. Villeneuve Bargemon JB, Merlini L, Mathoulin C, Levadoux M. Arthroscopic radiocarpal tendinous inter-position for grade 2 scapholunate advanced collapse-surgical technique. J Hand Surg. 2022;27(05):889-94.
5. Maris S, Apergis E, Apostolopoulos A, Melissaridou D, Koulouvaris P, Papagelopoulos PJ, et al. Scapholunate advanced collapse (SLAC) and Scaphoid nonunion advanced collapse (SNAC): A review of treatment options for Stage II. Cureus. 2024;25:88-97.
6. Duraku LS, Hundepool CA, Hoogendam L, Selles RW, Heijden BEPA, Colaris JW, et al. Two-Corner fusion or Four-Corner fusion of the wrist for midcarpal osteoarthritis? A multicenter prospective comparative cohort study. Plastic Reconstructive Surgery. 2022;149(6):1130e-9e.
7. Artuso M, Protais M, Soubeyrand M. Arthroscopic proximal carpal row replacement by semitendinosus and gracilis graft (CArpus Row Plasty Using the Semitendinosus: CARPUS procedure). An anatomical study of 16 cases. Orthopaedics Traumatol Surg Res. 2022;108(7):103124.
8. Colman M, Kazzi WE, Salvia P, Feipel V, Schuind F. Three-Corner Arthrodesis (lunate-hamate-capitate) : clinical and kinematical evaluation. Acta Orthopaedica Belgica. 2020;86:62-72.
9. Roulet S, Nguyen MV, Cohen G, Sos C, Servasier L, Laulan J, et al. Total arthrodesis for non-rheumatoid wrists: Outcomes at 5 and 20 years of follow-up. Orthopaedics Traumatol Surg Res. 2023;109(3):103522
10. Aravinthan N, Siddiqui S, Khan M, Moro J, Pino PA, Prada C. Proximal row carpectomy with soft tissue interposition: a systematic review of clinical outcomes. Hand. 2024;9:84-92.
11. Vásquez M, Díaz J, Hernández E. Proximal carpectomy versus four-cornered arthrodesis in patients with lesions SLAC and SNAC. Mexican Orthopedic Act. 2019;33
12. Ahmadi AR, Duraku LS, Van Der Oest MJW, Hundepool CA, Selles RW, Zuidam JM. The never-ending battle between proximal row carpectomy and four corner arthrodesis: a systematic review and meta-analysis for the final verdict. J Plastic Reconstructive Aesthetic Surg. 2022;75(2):711-21.

Cite this article as: Santos LG, Ferrero RE, Pérez AL, Jiménez A, Sandoval S, Rodríguez ED. Scapholunate advanced collapse as a complication of a chronic scaphoid fracture. Int J Res Med Sci 2024;12:3904-6.