

Scapholunate Advanced Collapse with Capitate loss: Use of autologous bone graft during Capitate arthroplasty

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Abstract

Goubier, *et al.* in France proposed in 2011 the replacement of the head of the capitate by a pyrocarbon prosthesis in wrist osteoarthritis due either to Scapholunate advanced collapse (SLAC) or scaphoid non-union advanced collapse (SNAC) complicated of midcarpal arthritis and radiolunate arthritis or lunate loss, whatever the condition of the radius cartilage. Authors of this manuscript report their management of a particular case of wrist osteoarthritis due to a SLAC lesion at the stage III of Watson, complicated with an important capitate loss due to a partial capitate necrosis discovered during the procedure. Autologous bone graft when implanting the capitate prosthesis is a possible solution in case of capitate partial necrosis if it remains a partial and safe cortical bone. It should be considered besides other procedures like lunate-triquetrum-hamate-capitate (4 corners) fusion or capitulunate arthrodesis with scaphoid and triquetrum.

Keywords: *Wrist Osteoarthritis; Scapholunate Advanced Collapse; Scaphoid Non-Union Advanced Collapse; Capitate Arthroplasty; Autologous Bone Graft*

Introduction

Scapholunate dissociation or scaphoid pseudarthrosis may lead respectively to wrist osteoarthritis called Scapholunate advanced collapse (SLAC) and scaphoid non-union advanced collapse (SNAC) [1]. Goubier, *et al.* in France proposed in 2011 the replacement of the head of the capitate by pyrocarbon prosthesis in wrist osteoarthritis [2]. First indications were SLAC and SNAC lesions complicated with midcarpal arthritis and radiolunate osteoarthritis or lunate loss, whatever the condition of the radius cartilage. These conditions were described as the third stage of wrist joint degenerative changes by Watson [1]. Another indication was when osteoarthritis is discovered on head of the capitate during a procedure of first row carpectomy or few years after first row carpectomy, in case of degenerative changes of the head of the capitate [2]. But how to proceed when we have an important capitate loss due to necrosis in such cases? Authors of this manuscript report their treatment of a particular case of wrist osteoarthritis due to a SLAC lesion stage III associated to a very important capitate loss [3].

Case Report

It was a 55-year-old carpenter who presented an increasing wrist pain after a fall on the right hand that occurred 25 years ago. He consulted at that moment and several times later for continuous pain in his wrist but was treated for a sprain. It is the persistence of the pain, worsening as time goes by that motivated the patient to consult in our centre. At the examination, the right wrist was not swelling. Palpation was painful when mobilizing in flexion and extension quoted 7/10 (Visual Analog Scale staging). The range-of-motion was 45°

for flexion and 40° for extension. The average grasp strength was 20 kg. The patient was not febrile. The left wrist was unpainful with normal range-of-motion. The rest of musculoskeletal examination and general examination were normal. Standard X-Ray of the right wrist showed radiolunate and midcarpal arthritis with a central capitate geode. There was no carpal dislocation but the alignment between radius, lunate and capitate was not harmonious. Arthro-scann confirmed the diagnosis as right wrist arthritis complicated of SLAC lesion classified Watson stage III and capitate bone loss. He underwent surgery under regional anesthesia with the tourniquet. Dorsal approach was performed. The terminal branch of the posterior interosseous nerve was divided above the radioulnar joint after opening dorsal retinaculum. After capsulotomy and lesions investigations, we performed excision of lunate, scaphoid and triquetrum. The capitate examination showed cartilage defects and central bone necrosis which contraindicated either first row carpectomy or capitate prosthesis at first intention. We decided to use cancellous scaphoid homogenates as autologous bone graft. Firstly we cut the capitate necrotic part with pliers, and then we cut horizontally the capitate proximal pole using an oscillating saw. The capitate central part was empty and we revived it prudently with a 16 mm rasp in order to fill it before implanting a 14 mm pyrocarbon prosthesis. Intraoperative frontal and lateral fluoroscopic control of prosthesis axis was satisfying. We closed the capsule, and then the extensor retinaculum and we placed a suction drain to prevent hematoma before closing the skin. The wrist was immobilized in a palmar splint during 3 weeks with rehabilitation that started after two weeks when pain evaluation was 4/10 (VAS). At six months follow-up, pain evaluation was 2/10, the grasp strength 15 kg and the range-of-motion were 30° for flexion and 35° for extension. The patient was satisfied of the operation and returned to work.

Discussion

In SLAC or SNAC lesions with midcarpal joint osteoarthritis, proximal row resection is not indicated. In such cases, lunate-triquetrum-hamate-capitate (4 corners) fusion or capitulunate arthrodesis with scaphoid and triquetrum resection is generally proposed [2]. In our patient there was a capitate necrosis so these two procedures were no longer indicated. Total wrist arthrodesis was therefore an alternative. The advantage would have been an important pain relief but with a considerable loss of range-of-motion [4]. Since our patient was an active manual worker and because of his young age (55 years old), this procedure would have been detrimental for him. Another alternative was total wrist prosthesis. The advantage would have been a better range-of-motion but with greater risks like infection or bone loosening, recurrent surgery. The Resurfacing Capitate Pyrocarbon prosthesis (RCPI) was according to us the best alternative to reduce the pain with less risk than arthrodesis or total prosthesis in preserving the range-of-motion. The inconvenience was still the capitate necrosis with worse quality of cortical bone to allow good hold of the implant. We attempted RCPI with an autologous bone graft using cancellous scaphoid homogenates with success. Our fear was the implant migration during rehabilitation or a loosening around the prosthesis. The post-operative X-Rays controls were satisfying and we noted a good prosthesis fixation at six months follow-up. That ameliorated the pain considerably.

Conclusion

RCPI is a procedure that can be considered with autologous bone graft in case of an important capitate loss associated to SLAC or SNAC lesions stage III besides other procedures like lunate-triquetrum-hamate-capitate (4 corners) fusion or capitulunate arthrodesis with scaphoid and triquetrum.

Conflict of Interests

None.

Bibliography

1. Watson HK and Ballet FL. "The SLAC wrist: scapholunate advanced collapse pattern of degenerative arthritis". *Journal of Hand Surgery* 9.3 (1984): 358-365.
2. Goubier JN, et al. "Capitate Pyrocarbon Prosthesis in Radiocarpal Osteoarthritis". *Techniques in Hand and Upper Extremity Surgery* 15.1 (2011): 28-31.
3. Goubier JN and Teboul F. "Capitulunate arthrodesis with compression screws". *Techniques in Hand and Upper Extremity Surgery* 11.1 (2007): 24-28.
4. Houshian S and Schroder HA. "Wrist arthrodesis with the AO titanium wrist fusion plate: a consecutive series of 42 cases". *Journal of Hand Surgery* 26.4 (2001): 355-359.

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