

# Arthroscopic Treatment of Scaphotrapeziotrapezoid Osteoarthritis

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## KEYWORDS

• STT arthritis • Distal scaphoid resection • Wrist prosthesis

Scaphotrapeziotrapezoid (STT) joint osteoarthritis is less known than other types of wrist arthritis. This disease accounts for only 13% of all wrist arthritis sites.<sup>1</sup> Isolated lesions of this joint are rare and their therapeutic management is hard. The only treatment proposed for long was STT arthrodesis, a procedure of which the technical difficulty has caused numerous complications.<sup>2</sup> Pseudoarthrosis is common, and STT arthrodesis has been incriminated in the occurrence of radio-scaphoid osteoarthritis. Techniques of distal resection combined with interposition of biologic tissues such as tendons (flexor carpi radialis) have been described in the 1990s.<sup>3</sup> In other reports, interposition of a palmar or dorsal capsular prosthesis was combined with resection.<sup>4</sup> It was reasonable to carry out such procedures with arthroscopic aid to prevent extensive scar and the instability due to ligament lesions.<sup>5–8</sup>

## METHODS

The anatomy of the STT joint is simple. The concavity of the proximal trapeziotrapezoid joint matches the convexity of the scaphoid distal pole. The stabilization of this joint depends on the scaphotrapezial ligament, which is thicker on its palmar face. There are 2 important entities involved in such stabilization: the dorsal capsular reinforcement of the STT ligament and the palmar radioscaphocapitate ligament. This joint has close relationships with the radial artery that comes ahead of the joint and with the dorsal branch of this artery, which crosses back the scaphotrapezoid joint. The terminal branches of the radial nerve also pass in this area.

## THE SURGICAL TECHNIQUE

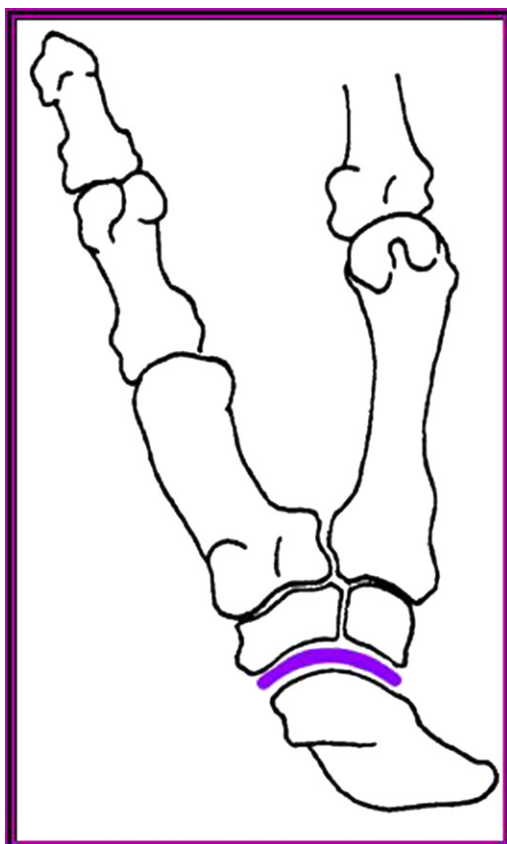
Patients are placed in the supine position. Traction is applied following the thumb axis using a Chinese fingertrap. Traction of 2 to 3 kg is sufficient. The joint is filled first with water via a midcarpal portal. The radial midcarpal portal is selected on principle. This portal allows initiating both the arthroscope and the arthroscopic aid and the examination of the joint (**Fig. 1**). Then the 1–2 midcarpal or STT portal is marked out using a needle. Much attention must be paid to the position of the radial artery and the radial nerve branches. As in any arthroscopic portal realization, small transverse incisions are performed in the skin only; then the joint is reached using a foam rubber forceps so as to prevent any lesion of the important parts in the area. A Spanish working group has described a palmar portal for which we have no experience.<sup>9</sup> Performing direct dorsal portal may be considered, provided the trapezial axis, and the specific round shape of this joint is taken into account. A sucking mechanical drill is inserted via the 1–2 portal. Resection is made, beginning at the internal dorsal side and pursued progressively under visual control until the palmar part of the scaphoid distal tubercle (**Fig. 2**). A resection of at least 2 to 3 mm is necessary. In case no implant has to be inserted, portals are left open or closed simply by Steristrips. In case of pyrocarbon implant interposition, the STT portal is slightly enlarged so as to ease the implant passage. There are 2 implant sizes (small and large; **Fig. 3**). Testing implants are inserted under arthroscopic control. Once the final implant is placed, a knot is performed on the joint capsule and the skin is closed by separate stitches.

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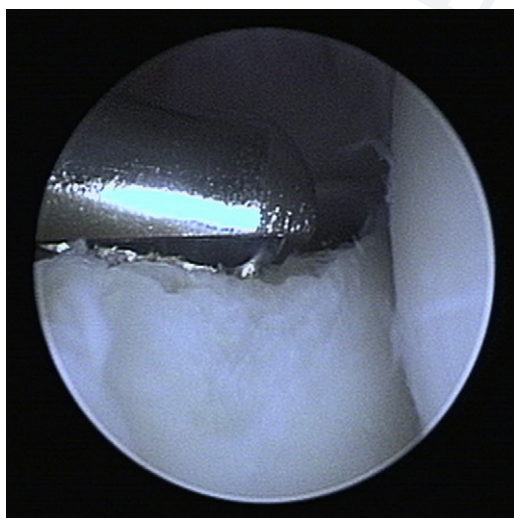
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**Fig. 1.** Outlined particular shape of the STT joint; this shape is to be taken into account when initiating the arthroscope and performing the scaphoid distal resection.



**Fig. 2.** Arthroscopic view showing the beginning of the resection; the capitatum is on the left, and the distal pole of the scaphoid is at the bottom of the figure.



**Fig. 3.** The 2 sizes of interposition scaphoid trapezium pyrocarbon implants. Notice the concavity of the proximal face that adequately matches the convexity of the scaphoid distal pole.

Commissural immobilization splint is always fitted for a 3-week period; then, patients can use their hands normally. Most often, rehabilitation is not necessary. From 2002 to 2005, we operated on 26 patients with isolated STT osteoarthritis. All had already undergone unsuccessful preoperative medical treatment combining orthosis-based immobilization, nonsteroidal antiinflammatory therapy, and corticoid infiltration. Treatment duration averaged 8 months (range, 3–18 months). In all patients, radiological assessment showed complete disappearance of the STT joint space. Sometimes, osseous cystic reaction was observed at the level of the scaphoid distal pole. Systematic front and side radiographies were performed so as to measure scapholunate angles and verify that no disaxation was present as a result of a lesion of intrinsic ligaments, which could constitute a reason for absolute contraindication.<sup>10</sup> The trapeziometacarpal joint was of course screened for any arthritic lesion that could also constitute a contraindication.

All patients were reassessed regularly, with an evaluation of mobility, muscle strength, pinch, pain, and return to prior activity. Outcome satisfaction was also assessed.

Data were analyzed in terms of the Green-O'Brien score.<sup>9</sup> When possible, comparisons with the contralateral side were performed.

## RESULTS

### *Isolated Resection of the Scaphoid Distal Pole*

The study population includes 13 women with an average age of 58 years (range, 52–64 years). In terms of the Green-O'Brien score, the analysis shows a mean preoperative value of 50, increased to 90 postoperatively (**Table 1**). Only 1 complication occurred: a transient dysesthesia on the

**Table 1**

	Preoperative Value	Postoperative Value
Pain	15	25
Motor Capacity		
Ulnar Deviation	15	25
Radial Deviation	5–15	20–25
Flexion	20	25
Extension	25	25
Occupation	15	25
Strength	5	15
Total Score	50	90

dorsal side of the thumb because of the irritation of a sensitive radial nerve branch. These dysesthesias resolved spontaneously. We observed a progressive compression of the scaphotrapezial space, but no pain phenomena occurred subsequently. Longer follow-up is necessary to confirm absence of pain recurrence (Fig. 4).

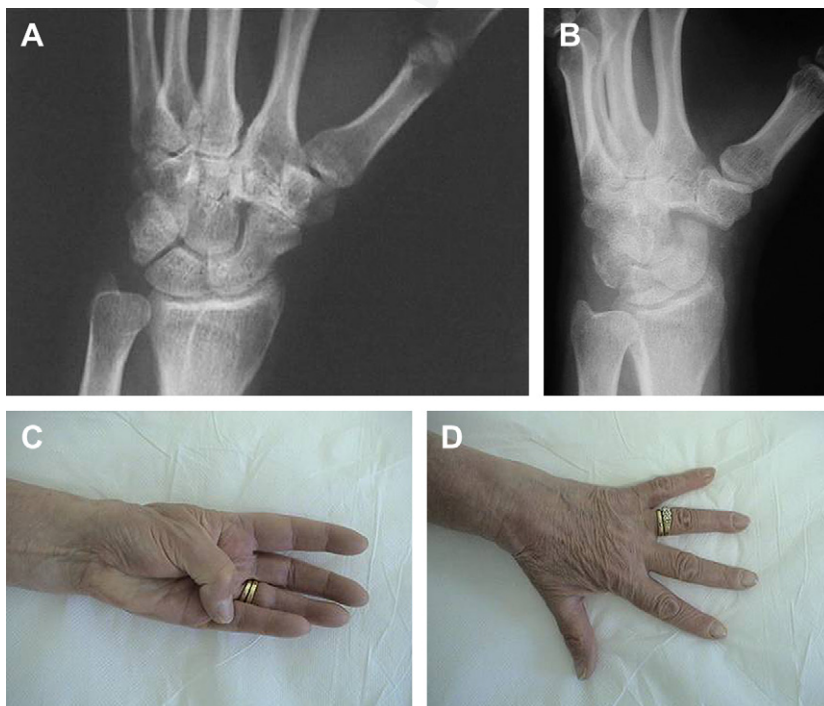
#### ***Interposition Scaphoid Trapezium Pyrocarbon Implants***

We operated on 13 patients using this technique, 12 women and 1 man. Their ages averaged 62

years (range, 48–79 years). All patients presented with disabling pains that worsened for several months and was refractory to conventional therapy, with a significant reduction of muscular and pinch strength and preservation of mobility. The average duration of the follow-up was 20 months (range 11–27 months). Overall mobility was improved in all patients; pain disappeared completely in 12 cases and diminished in 1 case. Two implant dislocations occurred in relation with a therapeutic mistake. In fact, the resection of the distal pole was insufficient, and it left a medial bone wall responsible for inadequate insertion of the implant. Affected patients underwent reinsertion by the same technique, including resection and reinsertion of the implant. Patients experienced no other problem postoperatively. No infectious complication had to be reported, and painful phenomena disappeared completely. Muscular strength, that is, grip and pinch, increased in all patients (Fig. 5).

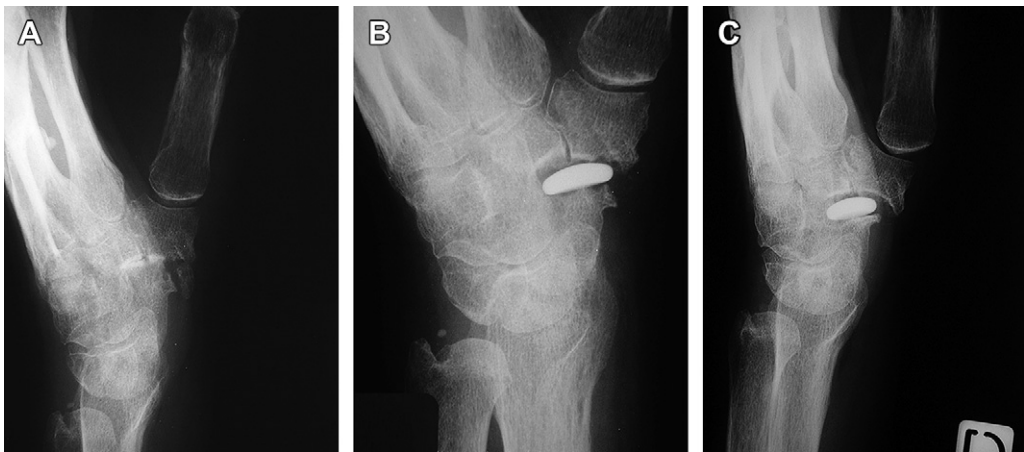
#### **DISCUSSION**

The outcome quality of such isolated resections is consistent with other results reported in the literature.<sup>6,11</sup> Nevertheless, it seems that progressive compression develops in the axis with time, with an impingement phenomenon at the level of the STT joint.



**Fig. 4.** (A) Isolated lesion of the STT joint in a 53-year-old female patient. (B) Outcome 4 years after isolated resection. (C, D) Good overall mobility, and no pain.





**Fig. 5.** (A) Isolated osteoarthritis of the STT joint in a 61-year-old female patient. (B) Radiograph of the inserted implant at 2 weeks. (C) Radiograph of the inserted implant at 4 years; the patient uses her hand normally and without experiencing any pain; the implant is still perfectly in place and very stable.


Inserting an interposition scaphoid trapezium pyrocarbon implant is likely to prevent this problem. However, this insertion necessitates strictly conforming to the surgical technique and procedure, in particular, regarding the resection of the distal pole. The advisability of a trapezial and trapezoid proximal resection may be considered because it seems to be more logical, but, from a technical point of view, the proximal part of the trapezium and the trapezoid being much more compact, its resection using miniaturized drills is obviously more difficult. In our 2 series, radiocarpal angles were not modified even at late assessments, after 4 years of follow-up. In case of peritrapezial osteoarthritis, these techniques may not be realized, and concerned patients should undergo preferably combined trapeziectomy and ligamentoplasty.

When the rules of interposition implant insertion are strictly and adequately respected, in particular, when the scaphoid distal pole is sufficiently resected, the outcome quality optimized by the mini-invasive portal access and the arthroscopic assistance suggest selecting some indications, although these should remain rare.

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