

THE SAUVÉ-KAPANDJI PROCEDURE FOR POSTTRAUMATIC WRIST DISORDERS : FURTHER EXPERIENCE

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A prospective survey was conducted to evaluate the outcome of the Sauvé-Kapandji procedure for post-traumatic wrist disorders.

Eighty four patients were treated, all with posttraumatic disorders of the distal radioulnar joint, 73 as an isolated procedure, 11 in combination with another wrist procedure.

There was significant pain decrease and high patient satisfaction (74%). The range of motion increased in the flexion/extension arc from 109° to 124° (p = 0.006) and, in those with limited forearm rotation, from 71° to 134° (p = 0.006). According to the Mayo Clinic wrist score, we obtained 20 excellent, 34 good, 18 fair and 12 poor results. Complications were rare.

Keywords : wrist ; distal radioulnar joint ; Sauvé-Kapandji.

Mots-clés : poignet ; articulation radio-cubitale distale ; Sauvé-Kapandji.

INTRODUCTION

Recent papers have stressed the importance of the distal radioulnar joint (DRUJ) in wrist fractures and other posttraumatic wrist conditions (15, 17). Despite advances in the diagnosis of these disorders with MRI and arthroscopy, treatment options remained limited. In 1936, Sauvé and Kapandji (14) described an original technique for dealing with recurrent dislocation of the DRUJ. Several papers from 1991 till now have reported on this technique which consists of arthrodesis of the DRUJ and creation of a pseudarthrosis proximal to the fusion mass (fig. 1). The indications have been extended to practically all disorders of the DRUJ

(2, 4-13, 16). We have performed this procedure rather than other salvage procedures such as the distal ulnar resection and Bowers' hemiresection interposition technique (1) for posttraumatic disorders of the DRUJ. The aim of this prospective survey is to present the results of this procedure with special attention to the subjective outcome and the evolution of grip force and range of motion. The preliminary results have been reported previously (18).

PATIENTS AND METHODS

Starting in 1991 we have conducted a prospective survey on the Sauvé-Kapandji procedure (SK). Only patients with posttraumatic disorders of the DRUJ were included. A detailed history was taken, pain was evaluated with a visual analogue score (VAS), range of motion of the wrist (flexion, extension and rotation) was measured with a goniometer, grip force was measured with a Jamar dynamometer. All procedures were performed by the senior author (LDS) or under his direct supervision. The operative technique has been described extensively (6, 9, 11, 18). We find it important to start mobilization on the first postoperative day.

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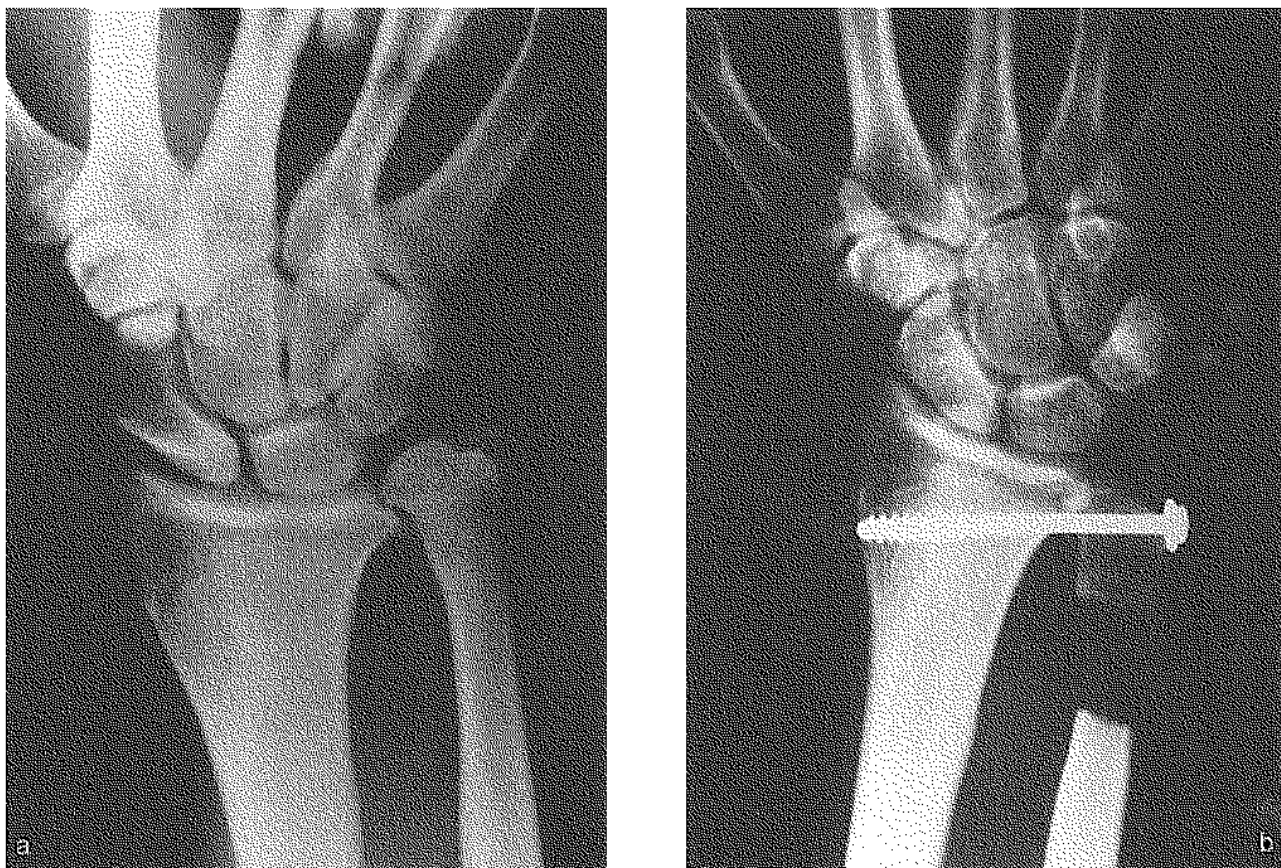


Fig. 1. — Typical postoperative aspect following a Sauvé-Kapandji procedure. a : preoperative view ; b : postoperative view.

The patients were reviewed on a regular basis and the follow-up was discontinued when the patients considered they had a good and stable result. A minimum of one year follow-up was obtained for each patient. At the last follow-up examination, the patients were asked for residual pain (VAS), satisfaction and complications. Grip force and range of motion were measured. Working capacities were checked and the Mayo wrist score was calculated (3).

During the period 1991-1998, 125 SK procedures were performed. We could retrieve 84 patients with sufficient data, 44 males and 40 females, with a mean age of 41.6 years (range 17 to 80). Most of them had a malunited Colles fracture (51) or an extended TFCC (triangular fibrocartilage complex) tear (17), 4 had a disorder of the DRUJ following resection of the radial head and 12 had a post-traumatic DRUJ osteoarthritis from various origins. There were 40 left and 44 right wrists. Inflammatory pathology of the DRUJ was excluded.

Eleven patients had a combined radiocarpal fusion and SK procedure, 73 had an isolated SK procedure. Results were statistically analyzed. A paired t-test was performed on all available preoperative and postoperative data. Significance level was set at $p < 0.01$.

RESULTS

The Mayo Clinic wrist score was 76.0 with 20 excellent, 34 good, 18 fair and 12 poor results. Pain decrease was significant ($p < 0.001$) with a mean VAS decreasing from 4.72 (SD 1.8) preoperatively to 1.46 (SD 1.72) postoperatively. There were no significant differences between the post-fracture group, the TFCC-related and the other groups. Most patients could resume their previous jobs ($N = 43$ or 68%), 4 had to change, 16 were still unemployed, 17 were retired or had no job ; in 3 cases

their professional activity remained obscure. The flexion/extension progressed from an arc of 109° preoperatively (SD 40.78) to 124° postoperatively (SD 40.00) ($p = 0.006$). Rotation was normal in 43 patients preoperatively and remained so, it was not clearly specified in 31 files and in the remaining 10 patients there was an increase from 71° (SD 48.8) to 134° (SD 54.9) ($p = 0.006$). The grip force achieved 64.7% of the contralateral side and increased from 14.5 kg (SD 11.72) preoperatively to 19.3 kg (SD 12.86) postoperatively ($p < 0.001$). Overall patient satisfaction was more than 80% in 62 patients (74%), and was less than 50% in 16 patients (19%), 6 were undecided. Complications were limited with 4 reossifications of the created gap, 3 cases of reflex sympathetic dystrophy, one case of severe radial impingement of the proximal ulnar stump, one important hematoma, 3 screw perforations of the cortex of the radius requiring reoperation and one stress fracture of the radius.

DISCUSSION

Several papers have been published on the Sauvé-Kapandji procedure over the last 10 years. Most series were limited or concerned a mixed population. This is one of the largest series published, prospectively studied and excluding rheumatoid patients. Several drawbacks of this procedure, frequently mentioned in the literature but not always proven, were not found in our survey.

There is confirmation of a good subjective outcome: there is marked improvement of pain and a high patient satisfaction (74%). This is also clearly seen in a high frequency of resuming the previous job. The allegedly decreased grip force is not confirmed. Although the final grip force remained below the contralateral side (65%), there was significant improvement from the preoperative status. One of the most annoying complications mentioned by several publications is radial impingement of the proximal ulnar stump. This was frequently observed during the course of the follow-up period, but only one patient complained about it at the follow-up examination. Since we did not stabilize the proximal stump, we think several technical details

can be considered to explain this low incidence. We performed the osteotomy of the ulna as distal as possible leaving about 0.8 cm of the ulnar head. The approach to the ulna was strictly lateral between the flexor and the extensor carpi ulnaris, leaving both undisturbed and suturing the pronator quadratus to the extensor carpi ulnaris tendon sheath. Immediate postoperative mobilization, the absence of any cast or orthosis and tonification exercises at 10 weeks postoperatively can also be considered as favorable factors to avoid impingement.

All clinical studies on the Sauvé-Kapandji procedure agree on the fact that favorable results are obtained in the majority of the cases. In the series of Sanders *et al.* (13), all patients had good or excellent results. Eight of the 15 cases reported by Gordon *et al.* (4) and 15 of the 23 nonrheumatoid patients from Taleisnik (16) were painfree. In the large series of Condamine *et al.* (2) (69 cases, 41 rheumatoid arthritis) 50% were painfree. Similar results were reported by Millroy *et al.* (9) (81% painfree), Nakamura *et al.* (11) (7/15 painfree), Mikkelsen *et al.* (8) (8/12 painfree), Rothwell *et al.* (12) (27/28 painfree), Minami *et al.* (10) and Lamey and Fernandez (7).

The relevances of this study are numerous and different from previous publications. It is the largest published patient population, all operations were done in one center by one surgeon. Patient retrieval was high (68%). Several indications for SK have been suggested but for this study, only posttraumatic DRUJ disorders were withheld. Most patients had enough preoperative data and the set-up of the study was prospective.

The conclusion is unanimous about the outcome concerning pain, increased range of motion and grip force. Instability of the proximal stump of the ulna, although not very frequent, remains unresolved. This study on a large group confirms previous findings.

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SAMENVATTING

L. De Smet, H. Van Ransbeeck. The Sauvé-Kapandji operatie voor post-traumatische stoornissen van distaal radio-ulnair gewricht.

Om de waarde van de Sauvé Kapandji procedure te evalueren werd een prospectieve studie opgestart. Vieren-tachtig patiënten, allen met een posttraumatisch letsel van het distaal radio-ulnair gewricht (DRUJ) werden aldus behandeld. Bij 73 was dit de enige ingreep, bij 11 werden er andere procedures simultaan uitgevoerd. Er was een significante pijnvermindering en een goede subjectieve beoordeling (74%). Het bewegingsamplitude verbeterde in flexie/extensie van 109° tot 124° (p = 0.006). Bij deze met voorafgaandelijk een beperkte rotatie was er toename van de onderarm rotatie van 71° tot 134° (p = 0.006). Volgens de Mayo pols score waren er 20 uitstekende, 34 goede (samen 64%) ; 18 matige en 12 slechte resultaten. Er waren slechts minimale complicaties.

RÉSUMÉ

L. De Smet, H. Van Ransbeeck. L'opération de Sauvé-Kapandji dans les séquelles post-traumatiques du poignet : expérience nouvelle.

Les auteurs ont réalisé une étude prospective pour évaluer les résultats de l'opération de Sauvé-Kapandji dans la pathologie post-traumatique du poignet. Ils ont traité 84 patients qui présentaient tous une pathologie d'origine traumatique au niveau de l'articulation radio-cubitale distale : l'opération de Sauvé-Kapandji a été réalisée de façon isolée dans 73 cas, associée à un autre geste chirurgical sur le poignet dans 11 autres cas.

Les auteurs ont constaté une réduction significative de la douleur et un haut degré de satisfaction des patients (74%). L'amplitude de mouvement en flexion-extension est passée de 109° à 124° (P = 0,006) ; les patients qui avaient une limitation de la pronosupination ont vu leur arc de mobilité en rotation passer de 71° à 134° (P = 0,006). Sur base du score de la Mayo Clinic pour l'évaluation du poignet, il y avait 20 résultats excellents, 34 bons, 18 médiocres et 12 mauvais. Les complications ont été rares.