ARTHROSCOPIC TREATMENT OF TRIANGULAR FIBROCARTILAGE COMPLEX LESIONS OF THE WRIST

L. DE SMET, A. DE FERM, A. STEENWERCKX, D. DAUWE, B. ZACHEE, G. FABRY

The arthroscopic treatments (suture, debridement and "wafer" resection of the distal ulna) performed for TFCC lesions in 42 patients were retrospectively reviewed. Overall results were disappointing, with a better outcome for isolated lesions, for sutured TFCC's and degenerative lesions.

Keywords : wrist ; TFCC ; arthroscopy.
Mots-clés : poignet ; ligament triangulaire ; arthroscopie.

INTRODUCTION

Treatment of lesions of the triangular fibrocartilage complex (TFCC) is a subject of debate. Conservative as well as operative options have been proposed. Direct approach to the TFCC (1-5) as well as indirect "decompressive" procedures on the ulna (6-11) have their proponents. The application to the wrist of arthroscopic techniques used in knee surgery has opened new perspectives. Although several authors published on this subject, results are scarse.

We report our series of arthroscopic treatment, repair and "ectomy" of TFCC lesions.

MATERIALS AND METHODS

From December 1991 to November 1993 we performed 129 wrist arthroscopies. In 49 patients a TFCC lesion was found and arthroscopically treated. In March 1994 we reviewed 42 patients with 43 wrists involved (6 did not respond) (table I). Eleven were treated for a type I_B lesion (12-13) ; a suture according to the technique of Zachee *et al.* (14) could be placed. In types I_A, I_C and II) (12, 13) debridement with a suction punch and powered shaver was achieved, and in 10 cases an arthroscopic wafer procedure was also done. The mean age was 32 years, ranging from 15 to 61 years ; there were 16 males and 26 females ; 19 right wrists, 22 left wrists and 1 bilateral case.

The mean follow-up was 29 months ranging from 17 to 43 months. In 18 wrists the TFCC lesion was the only abnormality found in the wrist ; other lesions could be detected in 25 wrists : 10 scapholunate ligament ruptures, 6 lunatotriquetral dissociations and cartilage lesions in 12 wrists. We based our evaluation on the subjective pain relief and the patient's satisfaction. We used a pain and function evaluation system (table II), and asked the patient to evaluate satisfaction and disappointment.

Differences were sought between results with isolated or combined lesions, and results of different techniques, using the Chi-square test ; $p < 0.05$ was taken as the significant difference ; $p < 0.1$ was considered as a trend.

RESULTS

Overall results were disappointing. Only 18 of the patients were satisfied with the procedure. The overall score was 46.7 (from 10 to 80) which classified 14 wrists as good (> 60), 16 as satisfactory and 13 as poor results (< 40).

Isolated TFCC lesions had better results : 10 out of the 18 patients were satisfied with a mean score of 66 (range 35 to 80). This was a trend ($p = 0.1$) compared to those with a combined pathology : 8 satisfied, scoring 71.6 (range 54 to 80).

University Hospital Pellenberg, Department of Orthopedics, K.U. Leuven, B-3212 Pellenberg.
Correspondence and reprints : L. De Smet.

Table I. — Summary of patients

Patient	Sex/ Age	Trauma	Clinical symptoms	Radiographs (U.V.)	Arthrography	Arthroscopy : Associated pathology	Treatment	FU (m)	Score	Satisfaction	Further surgery
1	M 35	Yes	UWP	+	1	SL	Shaving	42	80	Yes	
3	F 35	No	UWP	0	1	Cart.ulna	Shaving	35	26	No	Sauvé Kapandji
5	M 34	Yes	?	+	2	SL	Shaving	33	32	No	denervation, Darrach fusion
7	F 34	Yes	UWP	+	ND	SL, TL, Cart.rad	Shaving	31	22	No	fusion
8	M 34	Yes	UWP	+	1 + 2		Shaving	33	77	Yes	—
9	F 33	Yes	UWP	+	1 + 2	TL	Shaving	28	47	No	—
12	F 42	No	UWP	+	1	Cart.lun, triq, rad	Shaving	43	36	?	Sauvé Kapandji
13	F 42	No	UWP	+	1	Cart.lun., SL.	Shaving	43	36	?	Sauvé Kapandji
14	M 43	Yes	?	0	1 + 2	SL	Shaving	39	46	No	Triscaph arthrodesis
16	F 39	No	RWP	0	1	SL	Shaving	43	34	No	—
22	F 33	No	UWP	+	1		Shaving	19	40	No	Sauvé Kapandji
23	M 30	No	UWP	—	1 + 2	Cart.triq.	Shaving	42	72	Yes	—
24	M 30	Yes	UWP	0	1	Cart.rad.	Shaving	26	57	No	—
32	M 21	No	UWP	0	1		Shaving	31	50	No	—
33	F 23	No	?	0	no		Shaving	19	61	Yes	—
34	M 24	Yes	UWP	+	1		Shaving	30	69	Yes	—
35	F 25	Yes	?	0	1		Shaving	17	36	No	—
36	F 24	Yes	?	0	1	Cart.lun., Südeck	Shaving	20	13	No	denervation
37	F 15	Yes	UWP	0	ND	TL	Shaving	41	38	No	—
38	F 16	Yes	UWP	0	no		Shaving	41	80	Yes	—
39	F 18	No	?	+	ND	TL	Shaving	22	54	?	ligamentoplasty
43	F 26	Yes	UWP	+	no		Shaving	31	77	Yes	—
2	F 36	No	UWP	+	no		Wafer	23	44	No	wrist fusion
6	F 35	Yes	UWP	0	1 + 2	Cart.rad.	Wafer	35	58	?	ligamentoplasty
10	F 61	No	UWP	+	ND	Cart.Triq.	Wafer	23	80	Yes	—
11	F 51	No	UWP	+	ND	Cart.ulna	Wafer	26	35	Yes	—
15	M 41	Yes	?	0	no		Wafer	29	18	?	open wafer resection

Table I. — Summary of patients (*continued*)

19	F 40	No	UWP	+	no	Cart.STT	Wafer	20	45	No	—
29	M 28	No	UWP	+	no		Wafer	25	18	?	ligamentoplasty
30	F 27	No	?	0	1		Wafer	28	61	Yes	—
31	F 21	No	?	0	2	TL	Wafer	22	14	No	open wafer resection
40	M 20	No	?	+	ND	SL	Wafer	21	80	Yes	—
4	F 32	Yes	UWP	0	ND	Cart.ham.	Suture	18	10	No	—
17	F 41	No	?	+	no	SL	Suture	28	57	Yes	Sauvé Kapandji
18	F 40	No	?	0	ND	SL	Suture	37	54	Yes	Triscaph arthrodesis
20	M 39	No	RWP	0	no		Suture	20	45	?	—
21	F 37	Yes	UWP	+	no		Suture	31	19	No	ligamentoplasty
25	M 30	Yes	?	+	1		Suture	21	65	Yes	—
26	M 29	No	?	+	no		Suture	23	80	Yes	—
27	M 29	No	UWP	+	no		Suture	28	77	Yes	—
28	M 28	No	UWP	no	no		Suture	18	61	Yes	—
41	F 32	Yes	UWP	0	2	TL	Suture	29	40	No	Sauvé Kapandji
42	F 25	No	?	+	ND	SL	Suture	38	61	Yes	ligamentoplasty

SL : Scapholunate ligament tear
TL : Triquetrolunate ligament tear
cart : Cartilage damage
lun : lunate, rad : radius, ham : hamatum, triq : triquetrum,
STT : scaphotrapezoid joint
? : not decided, unknown
UWP : ulnar wrist pain
ND : not done
no : normal
1 : leakage to the distal radioulnar joint
2 : leakage to the midcarpal joint

Table II. — Pain score

1. Pain during activity	
No pain |_____| Intolerable pain	
(15 points) (0 points)	
2. Pain at rest	
No pain |_____| Intolerable pain	
(15 points) (0 points)	
3. Nocturnal pain	
I have no pain at night	10 points
moderate pain at night	5 points
severe pain (disturbed sleep due to the wrist pain)	0 points
4. Level of activity-work/recreational activities	
I do all kinds of work/recreational activities	20 points
I do most kinds of work/recreactional activities but have to avoid a heavy load on my wrist	12 points
I do not do any kind of work/recreational activities that puts a load on my wrist	5 points
I cannot do anything with the hand (wrist)	0 points
5. Activities of daily living	
I can do all kinds of housework	20 points
I can do most kinds of housework except some of the heavy cleaning, laundry, etc.	12 points
I cannot do any of the housework because of the wrist	5 points
I cannot do anything with my hand because of the wrist (need help with personal hygiene)	0 points
Questionnaire/score for subjective assessment of pain and level of activity.	

Sutures did remarkably well : 7 of the 11 patients were satisfied with a score of 66.3 (range 54-80), compared to the "ectomy" surgery which scored 48 (range 18 to 20) and with 10 of the 32 satisfied ; the difference was not significant but can also be considered as a trend ($p = 0.1$) (Chi square test).

Nineteen wrists required additional surgery.

There was no correlation between age or gender and result. Patients mentioning trauma had a worse outcome, (6/19) than those not recalling trauma (12/24) (Chi square, $p = 0.26$, not significant). There was no significant correlation between preoperative symptoms, ulnar variance or arthographic findings.

DISCUSSION

The role of TFCC lesions in ulnar wrist pain is not clear. In hominids a communication between the radiocarpal (RCA) and distal radioulnar joint (DRUJ) exists (15, 16). In man both compartments are isolated, and communication is the consequence of ruptures or degenerative perforations of the TFCC (12, 13).

Palmer (13) made a clear distinction between traumatic TFCC lesions (= Group I) and degenerative perforations (= Group II). Micik, Viegas and Ballantyne and Fortems *et al.* (17, 18, 19) have found an increasing incidence of TFCC perforations with advancing age. The existence of a communication between the RCA and DRUJ in patients over 40 years old without a history of trauma does not necessarily represent the cause of the symptoms.

The parallelism between knee menisci and the TFCC suggested an arthroscopic approach, and one could hope for a similar favorable outcome. As far as we know results of arthroscopic debridement of the TFCC have been published once (23).

Table III. — Review of recent literature

	Year	N	Good results
"Ectomy" surgery			
Vander Linden (4)	1986	33	30
Coleman (20)	1960	14	all
Imbreglia (10)	1983	16	14
Menon (2)	1989	16	11
Ulnar shortening			
Boulas (7)	1990	10	9
Darrow (8)	1985	36	28
Wafer			
Bilos (6)	1991	7	6
Feldon (9)	1992	13	all
Reinsertion TFCC			
Hermansdorfer (1)	1991	13	10
Hagert (22)	1987	10	10
Cooney (21)	1994	33	26

More than half of 23 patients had persisting symptoms.

Treatment of TFCC lesions has been poorly documented. The results of suturing and resections (or debridements) with or without additional surgery on the ulna (shortening, wafer-procedure) are limited (table III).

This survey has several important shortcomings : it is a retrospective one and it was practically impossible to detect in retrospect the mechanism of trauma, and sometimes even impossible to distinguish between a traumatic event or a degenerative process. In this series we were able to follow 89% of the patients, with a minimal follow-up of 17 months, of a consecutive series over a 2-year period. The overall result is rather disappointing, compared to other similar (open) procedures (table III), but similar to the only documented series of arthroscopic treatment (23).

There are several reasons for these results. First of all, these procedures were done in the beginning of the experience of the authors and results are negatively influenced by the learning curve.

In the follow-up we concentrated almost completely on pain relief, probably the most difficult parameter to measure. The rationale for this evaluation was that we treated patients whose major complaint was pain, rather than functional impairment.

Probably the most important reason for the high failure rate was a diagnostic one. When the TFCC lesion is the sole finding during arthroscopy of a wrist with ulnar pain, one could speculate that this lesion is the cause of the pain, and treatment gives acceptable results.

We are aware of the heterogeneity of this series, but the purpose of this survey was to evaluate the results of arthroscopic surgery for TFCC lesions, and to document them with hard data, which fails in most papers. The discovery of a (degenerative) TFCC lesion and its debridement with or without a wafer procedure do not guarantee a successful outcome, particularly when it is combined with other ligamentous or cartilaginous lesions.

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SAMENVATTING

L. DE SMET, A. DE FERM, A. STEENWERCKX, D. DAUWE, B. ZACHEE, G. FABRY. Arthroscopische behandeling van TFCC letsels van de pols.

Bij 42 patiënten werden de resultaten van de arthroscopische behandeling van TFCC letsels geëvalueerd. Het globale resultaat is ontgoochelend met een beter resultaat bij geïsoleerde letsels, degeneratieve letsels en TFCC-suturen.

RÉSUMÉ

L. DE SMET, A. DE FERM, A. STEENWERCKX, D. DAUWE, B. ZACHEE, G. FABRY. Traitement arthroscopique des lésions du ligament triangulaire du carpe.

Les résultats du traitement des lésions du ligament triangulaire du carpe par voie arthroscopique ont été évalués chez 42 patients. Le résultat global est décevant avec cependant un score plus favorable pour les lésions dégénératives, les lésions isolées et les sutures du ligament.