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ORIGINAL STUDY

Evaluation of current treatment techniques for distal radius fractures amongst Belgian orthopaedic surgeons

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This online questionnaire was initiated to investigate if a consensus on the treatment of distal radius fractures amongst orthopaedic surgeons in Belgium exist. Two cases were presented : an extra-articular fracture, with dorsal displacement (Frykman type I) and a displaced intra-articular fracture (Frykman type VII). Treatment of choice and rationale of choice were investigated. 158 responses were collected. In case of a Frykman type I, the majority of surgeons would have performed a closed reduction and intrafocal K-wiring (37.3%) or volar plating (34.8%). In case of a Frykman type VII, volar plating was the primary treatment of choice (66.5%), closed reduction and K-wiring was chosen in 24.7% and external fixation in 4.4%. We cannot conclude on a consensus in treatment choice amongst Belgian orthopaedic surgeons. Compared to previous research, an increase in the use of volar plating in intra- as well as in extra-articular distal radius fractures was noticed.

Keywords : distal radius fracture ; questionnaire.

INTRODUCTION

Several techniques to treat displaced distal radius fractures (DRF) to achieve a stable, painless wrist with good function are described (*1,11*). In the elderly, a satisfying outcome does not necessarily equal an anatomically reduced wrist, especially in the low-demand (*2,4*). Only few epidemiological studies were published that measure how often and why treatment techniques are applied (*3,12,13*). We designed a national online survey to investigate current concepts on treatment of displaced DRF amongst Belgian orthopaedic surgeons.

MATERIALS AND METHODS

All members of the Flemish and French speaking Orthopaedic Association (BVOT and SORBCOT) (554 members) were invited by e-mail to fill out an online questionnaire on two cases : case 1 an intra-articular (IA) fracture, with dorsal displacement (Frykman type VII) and case 2 an extra-articular (EA) fracture, with dorsal displacement (Frykman type I) (*5*). Besides their radiological presentation, additional clinical information as being closed fractures on the non-dominant hand, in elderly women, was provided (Fig. 1, 2).

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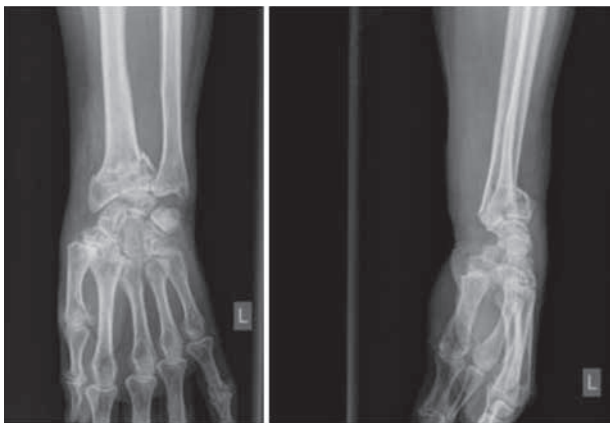

Fig. 1. — Case 1 (IA), x-ray distal radius AP and lateral view, female 73 y.

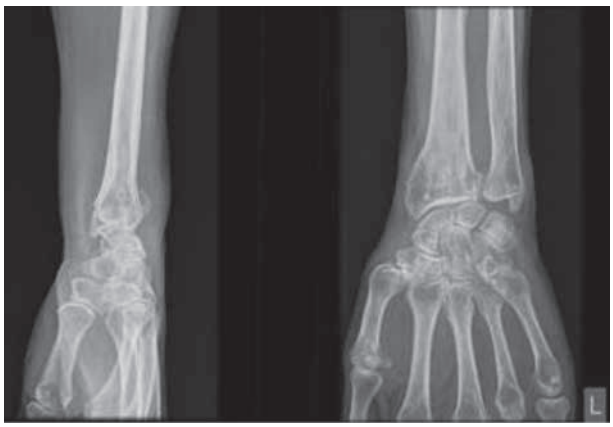

Fig. 2. — Case 2 (EA), x-ray distal radius lateral and AP view, female 78 y.

Questioning focused on demographics of the respondents, treatment of choice for the presented cases, follow-up protocol including radiological and clinical reevaluation frequency and prescribed postoperative analgesia. Rationale for treatment of choice in both cases was questioned (seven options ; one or more could be marked).

RESULTS

158 responses (response ratio 28.5%) were received. The respondents mostly worked in non-academic hospitals (85% versus 12% academic) and resided in the Flemish region of Belgium (69%), the French speaking region (15%), Brussels capital region (11%), the Netherlands (3%) and in 2% of respondents these data were missing 24.7% of respondents were hand surgeons, 24% trauma surgeons, 46.8% general surgeons (residents 16.5% and 4.4% missing)

In case 1 (Frykman type VII fracture) volar plating was the preferred treatment of choice (66.5%) above closed reduction under anesthesia and K-wiring (24.7%) and external fixation (4.4%). Volar plating was treatment of choice for hand surgeons in 92%, trauma surgeons in 60.5%, general surgeons in 63.5% and residents (92.3%) (Fig. 3). Surgeons with a longer work experience tended to use all techniques without a clear preference. More experienced surgeons in treating distal radius fractures (50-150 DRF operations/year) favor volar plating in 81.6% of the cases. Regional differences were noted : surgeons from the French speaking region preferred volar plating in 39%, compared to 74% in Flanders and 65% in Brussels capital region.

In case 2 (Frykman type I fracture), closed reduction and K-wiring (37.3%) was chosen in 37.3% and volar plating in 34.8%. Closed reduction under anesthesia and casting (19.6%), casting without manipulation (5.1%) and external fixation (6%) were less preferred treatment options. Hand surgeons (64%) tended to use volar plating more often than other surgeons (Fig. 4). We did not find a clear difference in treatment choice according to work experience or work region. Experienced surgeons tend to perform volar plating in the majority of cases.

Surgeons indicated ‘best functional outcome’ as primary rationale for their treatment of choice in 64.6% for case one and 45.5% in case two (Table I). In case 1 (IA) the hand surgeons in 76.9%, trauma surgeons in 57.9% and general surgeons in 63.5%, chose best functional outcome as primary rationale. Evidence based medicine as rationale is mentioned by trauma and general surgeons in 10.5 and 14.9%, 38.5% of the hand surgeons mentioned EBM. 25.6% of the trauma surgeons chose for the option “simple and easy” where only 7.7% of the hand surgeons used this option (Table II). In case 2 (EA) best functional outcome was again primarily chosen by hand

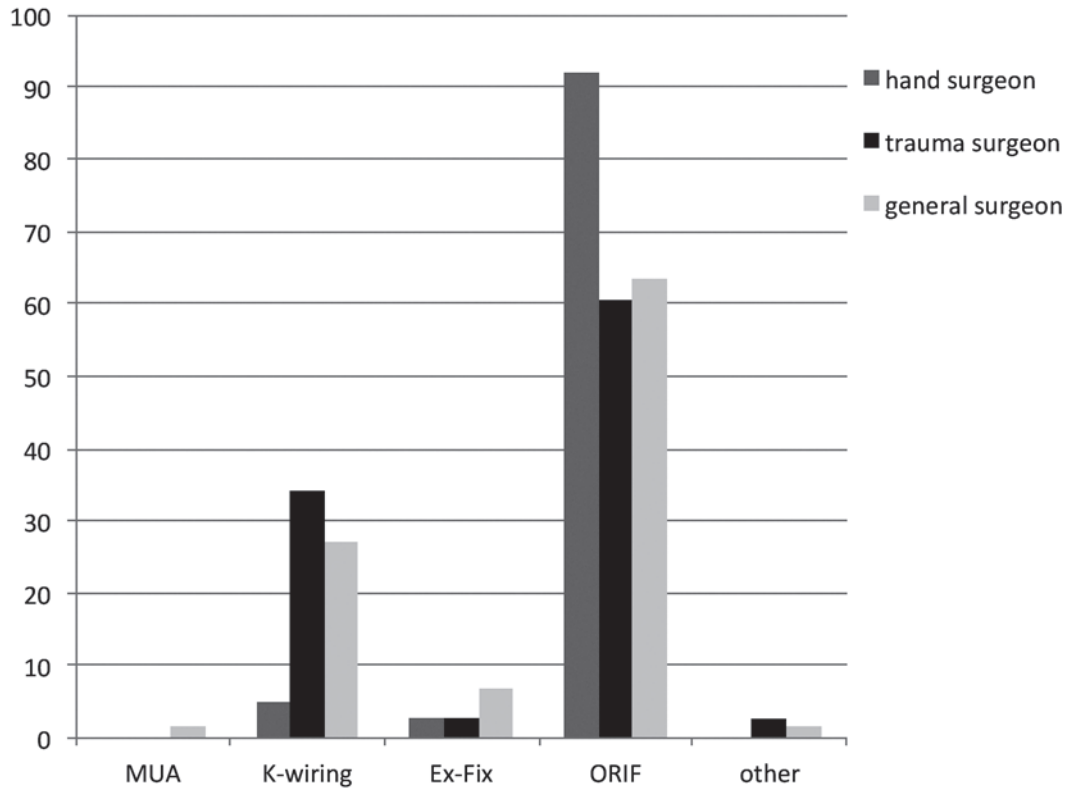

Fig. 3. — Case 1, Treatment of choice by specialty (IA in%)

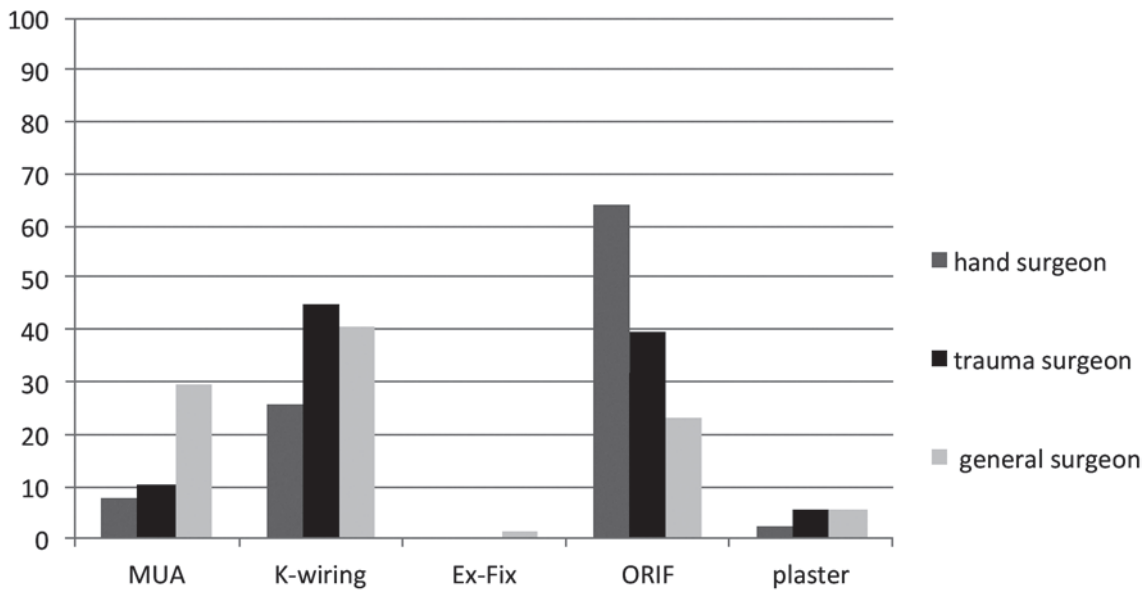

Fig. 4. — Case 2, Treatment of choice by specialty (EA in%)

Table I. — Treatment rationale case 1 (IA) DRF and case 2 (EA) DRF

Treatment rationale		
	case 1 IA DRF	case 2 EA DRF
Best functional outcome	64.2%	44.7%
Economical	22%	32.7%
Less complications	22.6%	26.4%
Personal education	25.8%	22.6%
Simple- easy	15.7%	26.4%
Most experience	19.5%	19.5%
Evidence based medicine	18.9%	15.7%

surgeons in 61.5%, trauma surgeons in 42.1% and general surgeons in 39.2%. Evidence based medicine was elected by the trauma – and general surgeons in 7.9 and 12.2%, 33.3% of the hand surgeons chose EBM. Personal education is chosen in 28.9, 25.7 and 12.8% by the trauma surgeon, general surgeon and the hand surgeons (Table III).

Postoperative protocols varied substantially in the number of follow-up consultations and follow-up radiographs. Most frequently the protocol consisted of a clinical and radiological follow-up on the 1st, 2th, 6th week and after 3 months. Acetaminophen was analgesia of choice in both cases (97.5/97.4%). 7% of the surgeons prescribed in both cases ascorbic acid (vitamin C) as prophylaxis for complex regional pain syndrome.

DISCUSSION

There is still no clear consensus on how to treat displaced distal radius fractures in the elderly (*2,4*). This study investigated the treatment options and their rationale of Belgian orthopaedic surgeons for two different types of displaced distal radius fractures. Where other studies merely focused on treatment preference, this study examined treatment preference as well as its rationale (*3,14*).

Hull *et al* published a study (2010) in which five cases, different DRF, were presented to 50 Orthopaedic surgeons from the UK, while our study had 158 responders or 28.5% of the Belgian Orthopaedic society. In the study of Hull *et al*, 52% of the surgeons preferred a volar locking plate as a treatment option for all fracture types (*7*). In our study 66.8% of the respondents indicated volar plating as their treatment option of choice for the intra-articular and 34.8% in extra-articular fractures. Since both studies differed in presented fracture types and study design, comparing results is difficult. In both studies though, there was a clear tendency to use volar plating, especially by registrars. In the study of Hull *et al*, most surgeons performed one or more clinical follow-ups and one or two radiological controls after surgery. In our series a much wider variety was noticed in clinical and radiological controls, which can possibly be explained by the existing differences in insurance systems between the UK and Belgium, and lack of universally applied guidelines.

Table II. — Treatment rationale case 1 (IA) DRF, devided by subspecialisation

Treatment Rationale			
case 1 (IA)	hand surgeon	trauma surgeon	general surgeon
Best functional outcome	76.9%	57.9%	63.5%
Economical	33.3%	23.7%	13.5%
Less complications	28.1%	31.6%	16.2%
Personal education	7.7%	25.6%	32.4%
Simple- easy	7.7%	25.6%	12.2%
Most experience	23.1%	28.9%	28.4%
Evidence based medicine	38.5%	10.5%	14.9%

Table III. — Treatment rationale case 2 (EA) DRF, devided by subspecialisation

Treatment Rationale			
case 2 (EA) DRF	hand surgeon	trauma surgeon	general surgeon
Best functional outcome	61.5%	42.1%	39.2%
Economical	26.1%	28.9%	28.4%
Less complications	28.2%	25.6%	24.3%
Personal education	12.8%	28.9%	25.7%
Simple- easy	28.2%	25.6%	24.3%
Most experience	20.5%	21.1%	20.3%
Evidence based medicine	33.3%	7.9%	12.2%

Table IV. — Comparison of the study of Nazar versus van Schaik of the use of volar plating in the displaced DRF (IA-EA)

Intraarticular DRF	handsurgeon	others
Nazar	63%	23%
vSchaik	92%	63%
Extraarticular DRF		
Nazar	63%	18%
vSchaik	64%	29%

Nazar *et al* conducted a postal survey in 2009 with a comparable amount of respondents and comparable proposed fracture types (intra- and extra-articular DRF) to evaluate the treatment of choice (Nazar 2009) (*9*). Like in our study, no clear consensus amongst the questioned surgeons was found. Nevertheless, there seems to be an increase in the use of volar plating. In the intra-articular fracture an increased use by hand surgeons from 63% to 92% and by general surgeons from 23% to 63% was found. (Nazar versus van Schaik) In the extra-articular fracture group the use by general surgeons increased from 18% to 29% (Nazar versus van Schaik) (Table IV). Both studies differed in the presented patient age : patients were elderly in our study, under 50 years old in the study of Nazar (*9*). The treatment of low-demanding elderly patients is much debated nowadays (*6*). Although we presented two elderly patients, without any information on their activity level, still an increase in volar plating was seen. This increase in use of volar plates was also previously described by others (*3,6,11,14*). Previous studies didn't question on rationale for the chosen technique. Evidence on which technique provides best functional outcome was already extensively examined. Volar plating is suggested to provide better functional outcome in the short term, but there is no conclusive evidence on the long term (*1,4,6,8,10,11*). No time of measurement was specified after surgery when 'best functional outcome' was evaluated in this questionnaire.

Evidence based medicine is only seldom used as an argument for treatment choice in both cases by the trauma and general surgeons, while the hand surgeons mentioned this as a justification in one third of the cases. Although there is still no conclusive evidence, maybe the hand surgeons follow the current tendency of using the volar plate more often. A quarter of the trauma surgeons chose in case 1 (IA) for the option simple and easy, where only few of the hand surgeons used this option. Hand surgeons perform rarely K-wiring as a technique and probably believe volar plating is not so simple and easy. Personal education is for the trauma – and general surgeon more often a reason to choose for a certain treatment option as it is for the hand surgeon. This could explain why K-wiring is more often chosen by the trauma and general surgeons, especially in case 2. Since volar plating is a more recently applied treatment, several surgeons were probably only educated in using k-wiring instead of volar plating.

Limitations of the study : this online survey proposed two cases based solely on radiological diagnosis, patients age and hand dominance. No additional details were provided on parameters influencing decision making in real life, like patient

history, trauma mechanism, patient expectations and time delay between diagnosis and actual surgery, cost and operation room availability.

Possible inclusion bias was accepted since respondents were authorized to categorize themselves in three pre-selected subspecialties. Respondents were possibly also limited in provided answers to choice, like treatments options.

CONCLUSION

We cannot conclude on a clear consensus in treatment choice amongst Belgian orthopaedic surgeons. Compared to previous research an increase in the use of volar plating in intra- as well as in extra-articular distal radius fractures was noticed.

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