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Surgical treatment of radial head isolated Mason III fractures

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ABSTRACT

Introduction: In this retrospective study we have analyzed a consec series of patients affected by isolated radial head Mason III fractures and with bone resection or prosthesis.
Patients and methods: This study includes 24 p d by fractures mentioned above and treated between July 2009 and November 2015.
15 patients (average age 48 y.o.) have been trea prosthesis. The remaining 9 (average age 573) have been treated with a capitel instead
From a clinical point of view, have evaluated t atients according to main performance indicators such as range of motion, pai nstability and May ow Performance Score as parameters.
Results: We have found simil esults in bot oup, with an average MEPS value of 95 in the prosthesis group and 966 in the adial h resection up.
The range of motion v imila betwe 3° and 1203° in the first group and between 4,4° and 120° in the second one. No s cant on has detected in any patient.
Discussion: According to m cent literature, it is not precisely defined how to treat isolated Mason III fractures, contrary to what is d d in more complex pattern, in which prosthesis are now evaluated as the best ation.
Due to radi d limited co ibution to elbow stability, in absence of other bony or ligamentous lesions bo itelle y and hesis can be good treatment in this kind of fracture.
Acco t experience and to the most recent literature, we recommend prosthesis in patient nger tha y.o., high demanding or manual worker, while in other cases we think that radial ead r tion can be the treatment of choice.

Introduction

The aim of s re pecti dy is to enlight the indications, m ods of t ment and results that can be achieved in th gical mana ment of isolated Mason III radial head fractures.

We introduce o clini experience analyzing the results obtained in patients t d at the Units of Orthopaedics and Traumatology of the "Policlinico San Matteo" in Pavia and at "Guglielmo da Saliceto" hospital in Piacenza.

The study has been focused on these fractures because of the limited instability provided by this kind of lesions, which is the reason why treatment indications are controversial.

Starting from the latest researches about this topic, we have analyzed clinical results obtained remotely both through resection and prosthesis of radial head. The aim was to assess whatever one of the two treatments may currently be preferred.

Patients and method

The group of patients consists of 24 people surgically treated for radial head isolated Mason III fracture between July 2009 and November 2015.

The patients were treated by specialists surgeons of the Units of Orthopaedics and Traumatology of the "Policlinico San Matteo" in Pavia and "Guglielmo da Saliceto" hospital in Piacenza. We treated 15 patients by prostehsis and 9 patients by capitellectomy.

Results were clinically evaluated through direct measurement of the range of motion at last inspection carried out at the elbow, the persistence of pain or any instability of the joint and through the use of Mayo Elbow Performance Score, a clinical score that

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considerate the parameters set out above in addition to the recovery of the ability of perform ADL by the patient.

The age of the patient was between 32 and 72 y.o. in the first group,with 7 patients older then 50 and 8 younger.

In the second group the range of age was between 35 and 8,with 6 patients older then 50 and 3 younger.

All the pateints included in the study were affected by an isolated radial head fractures without any other lesion affecting the interested elbow.

We considered in this study only patients affected by isolated radial head fracture,being any other associated lesion of the elbow an exclusion criteria.

Every patient was treated with almost immediate mobilization of the elbow and regularly evaluated at 1,3, 6, 12 months clinical and radiological follow-up at the outpatient department of the Clinic.

We performed standard x-rays (antero-posterior and lateral view) of the elbow at 1,3,6,12 months.

Results

Results achieved in prosthesis group have been very good, with an average value of MEPS of 95 recorded during last clinical control (range 80 and 100).

The range of motion detected in patients was good too, with average values of 120.3° (70° -140°) for the flexion and 1.3° (0° -10°) for the extension.

The clinical outcome was not affected by considerable complications in any case, both early and delayed.

During last clinical examinations, 3 patients complained of mild pain at the elbow during the joint motion and in a single case there was a slight valgus instability Table 1.

The dispersion of MEPS values measured was greater than in the other group.

At last control 8 of 15 patients had a MEPS value of 100, 4 of 95 a single patient of 85 and 2 a value of 80.Fig. 1

Patients undergoing resection of the radial head [illegible] been 9

Also in this group the clinical results [illegible] were [illegible] positive with an average MEPS score [illegible]6.6.

The average value of flexion was [illegible]° (90° [illegible]140°), while the average extension was 4.4° (0° [illegible]°).

In two cases there was a mild [illegible]bility [illegible]ess in valgus while only a patient complained of a slig[illegible]in at [illegible]control Table 2.

Analyzing the dispersion of MEPS values in relation to age we can find a rather uniform distribution of values, with a score of 100 in 4 cases, 95 in 4 and 90 in a single patient Fig. 2.

During the radiological follow-up we did'nt found any case of loosening or periphrostetic bone resorption (Figs. 3 and 4).

Discussion

Radial head isolated Mason III fractures in absence of capsule-ligamentous lesions are those whom treatment is more controversial.

During past years, the evolution of prosthesis has improved the clinical results of this treatment and today in literature several studies recently published have bee[illegible]owing extremely positive results [1–3].

In more complex pattern (f[illegible]res as[illegible]ated with capsular or ligamentous lesions with [illegible]upracor[illegible]lar fractures), most of authors have bee[illegible]greeing [illegible]roposi[illegible]he prosthesis as a treatment of choice [illegible]ractures im[illegible]ible to be fixed [4].

The situation is d[illegible]re[illegible]ithin fractu[illegible]analyzed in this study, in which there is not a clea[illegible]ence of a superiority of one of the two treatments.

The diss[illegible]rity of the pathol[illegible]cal pattern from a biomechanical point o[illegible]ar, considering that in this kind of injury the contributio[illegible]f the [illegible]head to the stability of the joint is significantly [illegible]i[illegible]portan[illegible] [5], and so it is reasonable to attend [illegible]so the r[illegible]ion can offer excellent results [6].

On the othe[illegible]nd it is also obvious to attend that prosthetic replacement sho[illegible]a offer a better elbow function, much more similar to [illegible]physiologic biomechanics of the joint [7].

In our [illegible]dy we had extremely positive results with both [illegible]MEPS values obtained by resection and prosthesis are similar (96.6 and 95 respectively) and can be considered excellent.

The average range of motion obtained during last clinical control was very good in both surgeries and results are similar, with no statistically significant differences in favor of one of the 2 treatments.

Slight residual pain was observed in 3 patients undergoing prosthesis and in one patient in the resection group.

We must underline that residual pain was always defined mild and not interfering with the execution of the activities of daily life and with work by all these patients.

Table 1
Prosthesis group.

Name	[illegible]te of born	[illegible]Age	Date of surgery	Prosthesis	Lato	Flexion	Extension	MEPS	Note
M.G.	[illegible] 1945	[illegible]3	30 07 2009	Evolve	L	0	140	80	Mild pain and instability
B.E.	17[illegible]077	[illegible]2	19 03 2010	Evolve	L	0	110	95	
D.M	25 0[illegible]	[illegible]38	04 06 2010	Evolve	R	0	90	95	
G.C.	18 05 1[illegible]	36	13 07 2010	Evolve	L	0	100	100	
B.C.	22 12 197[illegible]	30	20 10 2010	Evolve	L	10	70	80	Mild pain
L.J.	15 11 1983	27	23 06 2011	Recon	L	0	140	100	
P.M.	12 10 1939	72	27 04 2012	Recon	R	0	140	100	
B.S.	21 03 1952	62	11 04 2014	RHS	R	0	140	100	
S.D.	22 06 1969	45	28 08 2014	RHS	L	0	140	100	
S.P,	16 11 1968	45	20 06 2014	Recon	R	0	140	100	
O.S.	25 05 1978	36	26 08 2014	Recon	R	0	115	100	
M.F.	29 03 1951	63	20 11 2014	RHS	R	0	90	95	
M.L.	13 04 1957	58	17 04 2015	Slide Loc	L	0	140	95	
D.C.	24 07 1960	54	05 06 2015	Slide Loc	L	0	140	100	
Q.E.	26 02 1956	59	23 10 2015	Slide Loc	L	10	110	85	Mild pain
Mean		**48**				**1,3**	1203	**95**	

1. Dispersion Age-M[illegible] prosthesis.

A residual instability was detected in [illegible] patie[illegible] under[illegible] resection of the radial head and in on[illegible]tient o[illegible]e prosthesis group.

The observed instability has [illegible] mild[illegible] none of the 3 patients reported any limitations in [illegible] secon[illegible] to it.

All patients in our study defined the[illegible]lves sa[illegible]fied with the outcome.

It should also be noticed t[illegible] analyzing [illegible]rays of two patients with lower MEPS be[illegible]g to th[illegible]esth[illegible] group, we noticed an overstuffing of th[illegible]ipla[illegible]e mo[illegible]mon problem leading to unsatisfactory [illegible]nical resu[illegible]ccording to the majority of the authors [8].

We also analyzed the clinical results obtained in patients above and below 50 years with the 2 treatments and we have found no influence of this factor on the final outcome.

In the most recent literature there are a lot of studies with a long follow-up reporting good results with both radial head resection or prosthesis, but we found few authors who compared results obtained with these two treatment in isolated Mason type III fractures.

We found very interesting the study published by Lópiz et al. [9] that is similar to the one we present.They reported better results with radial head resection because of the higher rate of complications found with prosthesis.

Table 2
Radial head resection group.

Name	Date of born	Age	Date of surgery	Side	Extension	Flexion	MEPS	Note
Z.A.	04 04 1964	46	30 12 2010	R	0	140	100	
S.G.	28 01 1936	74	06 12 2010	L	0	90	95	
D.N.	17 03 1932	81	13 06 2013	R	0	140	100	
S.A.	08 01 1957	56	21 08 2013	R	0	110	95	Mild instability
M.V.	15 07 1968	45	19 03 2014	R	0	140	100	
P.L.	26 12 1943	70	20 08 2014	R	0	110	100	
C.S.	20 02 1980	35	10 03 2015	L	10	120	95	
B.B.	18 12 1961	53	05 10 2015	R	0	140	95	Mild instability
F.A.	17 06 1959	56	25 11 2015	L	30	90	90	Mild pain
Mean		573			**4,4**	**120**	966	

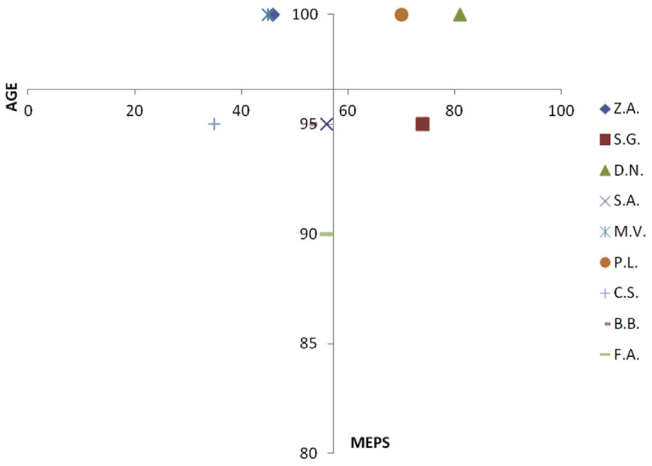

Fig. 2. Dispersion Age-MEPS capitellectomy.

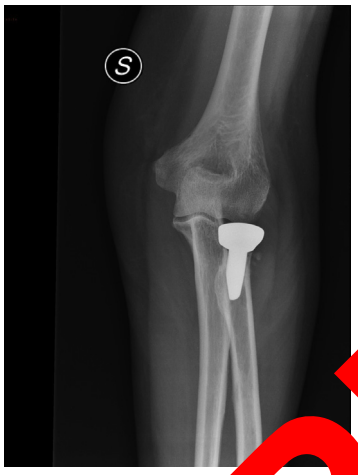

Fig. 3. Prosthe

Fig. 4. Radial head resection.

Another study that regards this kind of lesions is the one published by Pogliacomi et al that did not found evidence of the superiority of one of the purposed treatment in this kind of fractures [10].

Conclusion

Radial head isolated Mason III fractures represents an area of orthopedics in which there no gold-standard treatment. The results obtained with both the resection of the radial head and the prosthesis have been described as very positive by many authors.

The data obtained in our analysis seems to follow the same path, proving that both treatments can achieve excellent long-term functional results.

We also found that age in our series had not affected results for both treatment, which were similar in patients younger and older than 50 years.

The limits of our study are the sma number of patients, due, due to the incidence quite limited is kind of fractures, and follow up still of short-medium l nt.

We have not found any co cation ated to loosening or implant wear in patients un arthro sty and any symptoms reported to a tal radi ar in lity in patients undergoing resection radial hea gh both conditions can sometimes dev a long time

Related to this issue, important to remember that radiological findings of a prox radial migration greater than 3 mm after ars in patients un going radial head resection is described ne third of cases, but this finding is symptomati ly in imately 10% of patients [11].

In conclus sider g our experience and the analysis of literatu ile in fractures associated with other injuries here is clear ev nce of the superiority of the prosthesis, in the lesions treated i is study we would recommend as a treatment of choice r l head resection in patients over 50 y.o. in absence of gh func al request; in patients younger then 50 y.o., in manual worker we believe that prosthetic replacement can be the better solution.

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