ORIGINAL RESEARCH

Comparison of outcome of supracondylar fracture of humerus treated with crossed pin and lateral pins

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ABSTRACT

Background: A supracondylar fracture of the humerus is a type of break in the bone located just above the elbow, involving the distal humerus (the lower end of the upper arm bone). The present study was conducted to compare outcome of supracondylar fracture of humerus treated with crossed pin and lateral pins. **Materials & Methods:** 68 cases of supracondylar fracture of humerus of both genders were divided into 2 groups of 34 each. Group I were treated with crossed pin and group II with lateral pins. Parameters such as the mode of injury, the affected sideand complications were recorded. **Results:** Out of 68 patients, males were 30 and females were 38. In group Iand group II, side was right in 18 and 17 and left in 16 and 17. Mode of injury was fall in 25 and 29, RTA in 7 and 3 and violencein 2 each. Complications were radial nerve palsy in 1 and 2, ulnar nerve palsyin 3 and 5, pin tract infection in 0 and 2 and cubitus varus deformity in 1 each. Outcome was excellent in 30 and 26, good in 4 and 6 and fair in 0 and 2 patients respectively. The difference was significant (P< 0.05). **Conclusion:** Because crossover pinning was more stable than two parallel lateral pinning, it was judged to be superior.

Keywords: crossed pin, humerus, supracondylar fracture

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INTRODUCTION

A supracondylar fracture of the humerus is a type of break in the bone located just above the elbow, involving the distal humerus (the lower end of the upper arm bone). This type of fracture is particularly common in children, often resulting from a fall onto an outstretched arm.¹ Supracondylar fractures can be classified based on the displacement and direction of the fracture. In type I (Non-displaced), the bone is cracked but remains properly aligned. In type II (Displaced with intact posterior cortex), the bone is displaced but the posterior cortex remains intact. In type III (Completely displaced), the bone is completely displaced and there is no cortical contact.^{2,3}

The displaced supracondylar fracture of the humerus, after reduction, is fixed with pins and is immobilized in a plaster slab.⁴ The two principal configurations which have been reported in the literature for displaced supracondylar fractures are two lateral parallel pin fixation and cross (medial and lateral) pin fixation. The result of a close reduction and percutaneous pin fixation is directly related to the

functional and aesthetic outcome.⁵ The known consequences include instability, redisplacement, late malunion with varus deformity, and iatrogenic ulnar nerve damage. When treating displaced supracondylar fractures of the humerus in children, cross pinning was found to be more biomechanically stable than lateral pin.⁶The present study was conducted to compare outcome of supracondylar fracture of humerus treated with crossed pin and lateral pins.

MATERIALS & METHODS

The present study was conducted on68 cases of supracondylar fracture of humerus of both genders.All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 34 each. Group I were treated with crossed pin and group II with lateral pins.Parameters such as the mode of injury, the affected sideand complications were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS Table I Distribution of patients

Total- 68					
Gender	Male	Female			
Number	30	38			

Table I shows that out of 68 patients, males were 30 and females were 38.

Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Side	Right	18	17	0.95
	Left	16	17	
Mode of injury	Fall	25	29	0.16
	RTA	7	3	
	Violence	2	2	
Complications	Radial nerve palsy	1	2	0.05
	Ulnar nerve palsy	3	5	
	pin tract infection	0	2	
	Cubitus varus deformity	1	1	
Outcome	Excellent	30	26	0.04
	Good	4	6	
	Fair	0	2	

Table II shows that in group I and group II, side was right in 18 and 17 and left in 16 and 17. Mode of injury was fall in 25 and 29, RTA in 7 and 3 and violence in 2 each. Complications were radial nerve palsy in 1 and 2, ulnar nerve palsy in 3 and 5, pin tract infection in 0 and 2 and cubitus varus deformity in 1 each. Outcome was excellent in 30 and 26, good in 4 and 6 and fair in 0 and 2 patients respectively. The difference was significant (P < 0.05).



Graph I Assessment of parameters

DISCUSSION

The common symptoms are severe pain in the elbow and upper arm, swelling and bruising around the elbow, inability to move the elbow, deformity of the elbow (in severe cases) and numbness or tingling in the hand (if there is nerve involvement) etc.⁷When treating children with displaced supracondylar fractures of the humerus, effective reduction is essential to attaining superior functional and cosmetic benefits as well as maintaining the reduction until the fracture heals without problems.⁸ The pin fixing method is seldom without controversy. Two lateral pins are used, and they can be arranged in a divergent or parallel arrangement. The latter has a lower risk of ulnar nerve injury and is consequently more popular due to its greater biomechanical stability.⁹ According to research on adult cadavers and artificial pediatric bone models, the fixation of lateral pins may not be

sufficiently stable against torsional pressures, and additional lateral pins may be inserted as needed to control rotational instability.¹⁰The present study was conducted to compare outcome of supracondylar fracture of humerus treated with crossed pin and lateral pins.

We found that out of 68 patients, males were 30 and females were 38.Chakraborty et al¹¹compared the efficacy of the two recommended methods of internal fixation of the displaced supracondylar fractures, Gartland's Type II and Type III of the humerus in children. Out of the 92 patients, 56 (60.9%) were fixed with a medial lateral cross pin and 36 (39.1%) were fixed with lateral two parallel pins. The average age of the patients who were fixed with the medial lateral cross pin was $7.5\pm$ SD 2.3 years and that of those who were fixed with the lateral two parallel pins was $7.6\pm$ SD 3.0 years. 24 (26.1%) patients had type II and 68 (73.9%) had type III fractures.

We found that in group I and group II, side was right in 18 and 17 and left in 16 and 17. Mode of injury was fall in 25 and 29, RTA in 7 and 3 and violence in 2 each. Complications were radial nerve palsy in 1 and 2, ulnar nerve palsy in 3 and 5, pin tract infection in 0 and 2 and cubitus varus deformity in 1 each. Outcome was excellent in 30 and 26, good in 4 and 6 and fair in 0 and 2 patients respectively. Devkota et al¹² in their study 79 patients were treated by cross K-wires and in 23 cases lateral two K-wires were put. In cross K-wire group(N=79) 70.8% had excellent, 22.7% good, 3.8% fair and 2.5% had poor results at eight weeks follow up which was improved to 91.1% excellent, 6.3 good, 1.2% fair and 1.26% poor results at 14 weeks follow up. In lateral K-wire group (N=23) 70% had excellent, 21.7% good, 4.3% fair and 4.3% had poor result at eighth week which was improved to 91.3% excellent, 4.3% good, 4.3% fair and no poor result at 14th week follow up. Eight patients got superficial pin tract infection and seven patients sustained ulnar nerve injury post operatively.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that because crossover pinning was more stable than two parallel lateral pinning, it was judged to be superior.

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