



STUDY OF FRACTURE SUPRACONYLAR INTECONDYLAR HUMERUS TREATED WITH JESS FIXATION

Orthopaedics

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ABSTRACT

BACKGROUND : Fractures of distal humerus account for 2% of fractures in adults. Fractures of the distal humerus are often the result of a fall (low-energy injury) or a direct blow onto the back of the upper arm when the elbow is held in a flexed position (high-energy injury). Fractures due to falls are most common in the elderly while those resulting from trauma are more common in the younger population. In surgical procedure open reduction internal fixation or closed reduction with JESS fixation can be done.

The aim of study is to evaluate fracture supracondylar intercondylar humerus treated with JESS fixation.

MATERIALS AND METHODS : The study was a case series study and was conducted for period between May 2011 to September 2013. The treatment of supracondylar intercondylar fracture humerus with JESS fixation.

RESULTS & CONCLUSION : JESS fixation has advantage of higher union rate, low ulnar nerve palsy, low rate of infection. It provides good short term as well as midterm results.

KEYWORDS

Supracondylar intercondylar humerus, JESS fixator.

BACKGROUND

Fractures of the distal humerus accounts for 2% of fractures in adults. The incidence varies according to gender and age with a higher incidence seen among males in 12-19 year age groups while a higher incidence was seen in middle ages and elderly females.

The management of distal humeral fractures have evolved over the last few years. Worldwide application of the AO principles of plate and screw fixation during the late 1980s and early 1990s remained the only breakthrough for quite sometime. Recent major advancements in the management of these injuries include the widespread availability of CT scans with three dimensional reconstruction, recognition of the more complex articular shear fractures, understanding the benefits of the parallel plates and the selective use of total elbow arthroplasty.

Problems faced in distal humerus fractures are due to close proximity of fracture to the neuro-vascular structures, supra condylar Ridge is very thin & narrow, fixation difficult due to comminution.

In intra articular fracture of the lower end humerus the primary goal is to achieve a stable and mobile elbow. Fractures managed by closed reduction and cast application usually give poor results. Fractures managed by traction give better results but are not acceptable.

MATERIALS AND METHODS

It was a case study. The purpose of the study was to evaluate results of using JESS fixator for treatment of supracondylar intercondylar fracture humerus

The present study is a study of 30 cases of supracondylar humerus fracture treated with JESS fixation from MAY 2011 to SEPTEMBER 2013 at tertiary care hospital. Each patient with injury around elbow joint was reviewed in emergency department and examined thoroughly including general, local and systemic examination which includes vitals and to rule out associated head, abdominal, chest, pelvic injury. Also examination of associated injuries and xrays was done to assess the fracture pattern.

Inclusion criteria

- All fractures of supracondylar-intercondylar humerus were evaluated and classified according to AO classification.
- Both male and female patients aged above 18 years

Exclusion Criteria

- Isolated lateral condyle and medial epicondyle fractures.
- Compound distal humerus fracture.
- Comorbid patients.

Fracture was evaluated by xrays, CT-scan and classified according to

AO classification. All patients were admitted and temporary immobilized in the form of above elbow POP slab. In supination. Patients were evaluated from cardiopulmonary point of view and if necessary physician fitness was taken before surgery and essentially in all elderly patients.

RESULTS AND OBSERVATION

AGE IN YEARS	No. OF PATIENTS	PERCENTAGE
<30	10	33.3%
31-40	7	25%
41-50	5	16.6%
51-60	5	15%
61-70	1	3.3%
71-80	1	5%
>80	1	1.6%
Total	30	100%

Table 1. Age distribution of patient

In present study age varied from 18 to 80 years. 74.9% of the patients belong to the age group of 18 years.

Sex	No. Of Patients	Percentage
Male	23	76.6
Female	7	23.3

Table 2. Gender distribution

There was a male preponderance with Male:Female ratio near 3:1. Males were found working outdoor, involved in manual labor, farming working at heights etc.

Mode of injury	No of patients	Percentage
Motor vehicular accidents	11	36.6
Blunt trauma/assault	09	30
Fall from height	08	26.6
Sports injury	02	6.6
Fire arm injury	0	
Pathological fracture	0	

Table 3. Mode of Injury

In present study, 36.6% having motor vehicular accident, 30% having blunt trauma/assault injury, 26.6% having fall from height.

Side	No. of patients	Percentage
Right	13	45%
Left	17	55%
Total	30	100%

Table 4. Side distribution

In present study left side affected more than right.

Occupation	No. of Patients	Percentage
Diamond worker	2	6.66
Farmer	5	16.66
House wife	4	13.6
Jari worker	2	6.66
Manual worker	7	23.33
Painter	1	3.3
Retired	2	6.66
Student	3	10
Textile Worker	4	13.6
Total	30	100

Table 5. Occupation.

In present study there was predominance of worker.

No Of Days	No of patients	Percentages
05	01	3.3
06	14	46.6
07	12	40.0
10	01	3.3
11		
13	01	3.3
14	01	3.3
Total	30	100

Table 6. Hospital stay in days

In present study average hospital stay of patients in JESS fixation between 6-7 days after day of injury.

Type of Fracture	No of patients	Percentage
Type 13A- Extraarticular fracture		
1. Apophyseal avulsion	-	-
2. Metaphyseal simple	2	6.6
3. Metaphyseal multifragmentary	2	6.6
Type 13B – Partial articular fracture		
1. Sagittal lateral condyle	-	-
2. Sagittal medial condyle	-	-
3. frontal	-	-
Type 13C – Complete articular fractures		
1. Articular simple, metaphyseal simple	12	40
2. Articular simple, metaphyseal multifragmentary	10	33.33
3. Articular, multifragmentary	4	13.3

Table 7. Fracture classification

In present study 40% patients have C1 Articular simple, metaphyseal simple and 33.3% have C2 Articular simple, Metaphyseal multifragmentary fracture.

No. Of Days	No. Of Patients	Percentage
02	03	10
03	14	46.6
05	12	40
06	01	3.3
Total	30	100

Table 8. Starting of mobilization

In JESS fixation 97% patient were mobilized at 5 days after operation.

Time in weeks	JESS	Percentage
<10 weeks	14	46.6
10-14	10	33.3
14-18	3	10.0
18-22	2	6.6
>22	1	3.3
Total	30	100

Table 9. Time taken for union

In JESS most of the patients (90%) united within <18 weeks. 46.6% of patients united within <10 weeks. The average time for union was 10.5 weeks. One united in 18 weeks and second in 20 weeks.

In months	No of patients	Percentage
<10	14	46.6

10-12	4	13.3
12-14	6	20
14-18	4	13.3
>18	2	6.66
Total	30	100

Table 10. Duration of follow up

In present study average follow up period is 11.06 months

Complication	No of patients	Percentage
Post traumatic stiffness	3	10
Superficial Infection/ Pin tract infection	2	6.66
Non union	1	3.33
Ulnar nerve neuropraxia	0	-
Implant failure	1	3.33
Heterotropic Bone Formation	0	-

Table 11. Complications

From above study it is seen that only 3 patients having elbow stiffness and pin tract infection seen in two cases. Non union was observed in 1 patient. No ulnar nerve palsy was noted.

	No. of Patients	Percentage
Excellent (>90)	11	36.6
Good (75-89)	16	53.3
Fair (60-74)	2	6.6
Poor (<60)	1	3.3
Total	30	100
Mean		86.
SD		12.67
P value		0.04

Table 12. Mayo Elbow Performance Score

Twenty seven (90%) of the thirty patients achieved good to excellent ROM as determined by MEPS.

DISCUSSION

The main goal of present study is to evaluate the results of JESS fixation in the treatment of supracondylar intercondylar humerus fractures.

The surgical goal of fixation of distal humeral intercondylar fractures are to reconstruct the articular surface and to fix the distal humeral articular complex to the medial and lateral columns. It has been noted that stable fixation and appropriate postoperative rehabilitation yield good to excellent results in 75% to 80% of patients.

In present study 40% patients have C1 Articular simple, metaphyseal simple and 33.3% have C2 articular simple, metaphyseal multifragmentary fracture. The "Classification variable" has not demonstrated any substantial correlation and has no adverse influence in this study but long term results suggest that C1, C2 & C3 type of fractures have more pain & stiffness.

The patients in the present study were all age with wide range between 18 to 80 years. 74.9% of the patients belong to the age group of 18 to 60 years and mean age was 41.1 year.

Majority of patients in our series Male 76.6%. This goes to show male preponderance in series can be attributed to the fact that most of the traumas were as a result of motor vehicular accidents and fall from height.

The most common site of injury in the present series left side 55%. Right side was affected in 45% of patients.

In present study 36.6% having motor vehicular accident, 30% having blunt trauma/assault injury, 26.6% having fall from height.

Time taken for union in JESS fixation was <18 weeks. The average time for union was 11.06 weeks. One patient has non union due to very obese patient, k wire loosening. In present study in JESS fixation only 1 patient was found elbow stiffness. Elbow stiffness was assessed by MEPS. Good result achieved in JESS fixation due to early mobilization, no soft tissue dissection, triceps aponeurosis intact.

In present study there was no case of iatrogenic ulnar nerve palsy in

JESS fixation.

Twenty seven of the thirty patients achieved good to excellent ROM as determined by MEPS.

Good movements were achieved in cases where physiotherapy was started early. In our study in JESS fixation 97% patient were mobilized at 5 days after operation.

Moreover this JESS external fixator offers the advantage of component removal in any clinic, without the use of anaesthesia.

Excellent to good results were seen in JESS in present study.

CONCLUSION

The present study was aimed to evaluate the results of JESS fixation in the treatment of the fracture of the supracondylar intercondylar humerus.

From the above observation it is clear that jess fixation has following advantages.

- Higher union rate
- Lower rate of infection
- Lower ulna nerve complication
- Less time required for the procedure
- Lesser inventory needed
- More versatile, can be extended to associated fracture.
- Technique simpler can be one by relatively junior consultants.
- Triceps function preserved so extension mechanism of elbow preserved
- Allows earlier mobilization
- Allows adjustment and readjustment of frame
- Removal of frame done without anaesthesia.
- Technique can be applied to osteoporotic bone.
- Cost effective.

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