

Original Research Article

DCP vs LCDCP in forearm fractures: a comparative study of functional outcomes

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ABSTRACT

Background: Forearm fractures in general, and diaphyseal fractures in specific, are one of the most common fractures which accounts for about 31% of upper limb fractures seen in emergency. Early reduction and fixation is necessary in order to restore the function of forearm so as to be able to carry out their daily activities. The objective of this study was to compare the functional outcomes of forearm fractures fixed with DCP and LC DCP.

Methods: The present study was a hospital based study, and a prospective, comparative study. A total of 40 patients with fracture of both bones forearm were taken up for the study, and randomly divided into 2 groups of 20 patients each. They were followed up for a period of 1 year.

Results: The majority of patients were males (31 males and 9 females), involving age group 21-30. The left side was more common than right in both groups. The site of fracture was middle one-third of forearm in both groups (60% in group A and 65% in group B). The time for union was on average 4 weeks for LC DCP and DCP. ROM was full in 85% in DCP group and 90% in LC DCP group. Overall results were comparable in both groups. Excellent in 34 cases (18 in LC DCP, 16 in DCP), satisfactory in 5 cases (2 in LC DCP, 3 in DCP) and unsatisfactory in one case treated with DCP.

Conclusions: LC DCP provides slightly better functional outcome in terms of time taken for union, early mobilisation and range of motion. However, it is more expensive than DCP.

Keywords: Forearm fractures, LC DCP, DCP, Functional outcome

INTRODUCTION

For many years, surgeons have faced difficulties in restoring the anatomy and function of the fractured forearm. An early method of treatment was usually immobilisation of the forearm in a plaster cast for long periods of time. This resulted in non union and malunion and gave very poor functional results. Mere anatomical, rigid fixation with plates, to achieve union through primary bone healing also gives poor results due to periosteal stripping and excessive soft tissue loss. Hence, the recent emphasis is on "biological" fixation of long bone fractures. Conventional plating results in destruction

of the periosteum due to vascular compromise by pressure on the blood vessels by the plate.² This resulted in poor healing, increased risk of refracture on removal of implant. To counter these problems, the idea of "Limited contact dynamic compression plate" was developed¹. It has advantages over conventional plating, which include reduced risk of infections due to better blood supply, better rates of union and reduced risk of refracture.³ These advantages remain theoretical, so there is a need for a randomised, control trial to compare the functional outcomes of forearm fractures treated by conventional plating and limited contact plating.

Objective of the study

- To compare the functional outcome of DCP and LC-DCP in forêrm bone fractures.

METHODS

It was a hospital based study. Patients coming to the Orthopaedics OPD and casualty department of Yenepoya medical college and hospital, Manglore with forearm fractures were taken up for the study after satisfying the inclusion criteria. From January 1st 2017 to December 31st 2017.

Inclusion criteria

Inclusion criteria were patients with both bone fracture of forearm; patients aged between 15 and 60; patients available for follow up.

Exclusion criteria

Exclusion criteria were compound fractures of forearm bones; patients below the age of 15 years and above the age of 60 years; patients with compound fractures; patient medically unfit for surgery; patients not available for follow up.

40 patients with forearm fractures satisfying the inclusion criteria were taken up for the study, and divided into 2 groups of 2 patients each. One group (Group A) was treated with DCP, and the other group (Group B) was treated with LC DCP. Considering the above aims and objectives, the study was undertaken to compare the functional outcomes of DCP and LC DCP fixation in forearm fractures. The patients were followed up for a period of 3 months.

RESULTS

The majority of patients were males (31 males and 9 females), involving age group 21-30. The left side was more common than right in both groups. The site of fracture was middle one-third of forearm in both groups (60% in group A and 65% in group B). The time for union was on average 4 weeks for LC DCP and DCP. ROM was full in 85% in DCP group and 90% in LC DCP group.

Overall results were comparable in both groups. Excellent in 34 cases (18 in LC DCP, 16 in DCP), satisfactory in 5 cases (2 in LC DCP, 3 in DCP) and unsatisfactory in one case treated with DCP.

Table 1: Time of union underwent plating in weeks.

		Group			
		LC DCP		DCP	
		Count	Column N (%)	Count	Column N (%)
Time of union (weeks)	4	15	75.0	18	90.0
	6	3	15.0	0	0
	7	0	0	2	10.0
	8	2	10.0	0	0
	Total	20	100.0	20	100.0

Table 2: Range of movements compared in DCP and LC-DCP.

		Group			
		LC DCP		DCP	
		Count	Column N (%)	Count	Column N (%)
ROM	Full	18	90.0	17	85.0
	Good	2	10.0	3	15.0
	Total	20	100.0	20	100.0

Table 3: Complications observed in DCP and LC-DCP.

		Group			
		LC DCP		DCP	
		Count	Column N (%)	Count	Column N (%)
Complications	Present	2	10.0	4	20.0
	Absent	18	90.0	16	80.0
	Total	20	100.0	20	100.0

Table 4: Results.

		Group			
		LC DCP		DCP	
		Count	Column N (%)	Count	Column N (%)
Results	Excellent	18	90.0	16	80.0
	Satisfactory	2	10.0	3	15.0
	Un satisfactory	0	0	1	5.0
	Total	20	100.0	20	100.0



Figure 1: (A) Pre OP- DCP; (B) post OP- DCP.



Figure 2: (A) pre op LC-DCP, (B) post op LC-DCP.

DISCUSSION

Forearm fractures commonly occur due to increasing road traffic accidents. Forearm fractures is more common

in second and third decades of life. Males predominate in terms of high incidence of fractures.⁴ Majority of cases were middle third. Open reduction and Internal Fixation is the treatment of choice for the early mobilization of

forearm and wrist.⁶ The fracture fragments should be fixed as early as possible to achieve anatomical reduction with rigid internal fixation.³ The quality of fixation has a definite bearing on the functional recovery. In the early days of plating, DCP was the preferred method of fixation, as it provided good compression across the fracture site.⁷ For many years, this remained largely unchanged. However, studies showed that DCPs caused vascular compromise in the periosteum due to constant pressure by the plate, and also involved extensive periosteal stripping, all of which resulted in poor fracture healing. The 3.5 mm LC-DCP properly applied is an excellent method for internal fixation of fractures of the forearm.⁵ It was observed that the fracture gap was obliterated or greatly diminished by compression plates. A minimum of 7 cortices has to be fixed on either side of the fracture.⁸ It is not necessary to strip more than one third of the diameter of the shaft for most of the distance required for application of the plate and compression apparatus. After LC-DCP fixation, postoperative support given in the form of arm pouch in most instances can be discontinued after the soft tissues have healed and rapid return to full, painless motion can be anticipated. The average union time for the LC-DCP was less comparing to the DCP. This may be due to the biomechanical advantages of LC-DCP preserving the periosteal blood supply. The limited contact dynamic compression plating of forearm fractures produce excellent results, the advantages being early mobilization, early union and hence prevention of fracture disease. The only disadvantage is that it is more expensive than DCP.

The conclusion of our study was that limited contact dynamic compression plating has a definite advantage over dynamic compression plating with respect to time of union and screw placement in comminuted fractures, but the duration of surgery and surgical technique virtually remains unchanged.

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Ethical approval: The study was approved by the institutional ethics committee

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