

## Outcome of Fracture Both Bones Forearm Treated With Locking Compression Plate-A Prospective Study

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### Abstract -

**AIM :-** To study the functional outcome of treating diaphyseal fractures both bones forearm with Locking Compression Plates. To analyse the complications of using Locking Compression Plates. To study the duration of union using LCP

**METHODS :-** Over a period of one and a half years starting from August 2013 to July 2015

30 cases of fracture both bones of forearm were included in the study. All cases were treated by open reduction and internal fixation with 3.5mm LCP by a single surgeon. The functional outcome was assessed using "Anderson et al, scoring system"

**RESULT :-** Using the Anderson et al scoring system 70.4% of the patients had excellent results, 25.9% with satisfactory results and 3.7% non union.

**Conclusion :-** We observed that the 3.5mm LCP, properly applied, is an excellent method for internal fixation of fractures of the forearm bone.

**Keywords –** Both bones, diaphyseal, LCP

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### I. Introduction :-

The human forearm serves an important role in upper extremity function, facilitating placement of the hand in space thus helping to provide the upper extremity with its unique mobility<sup>1</sup>. The presence of the proximal and distal radioulnar joints allows supination and pronation, and such movements are important to all of us in usual activities of daily living. Moreover, the forearm serves as the origin for muscles inserting on the hand. Therefore fractures involving the bones of the forearm present unique problems not encountered with fractures of other long bones and may significantly affect the function of upper limb. The human forearm is adapted more for mobility than stability. Anatomical reduction and internal fixation of forearm fractures can facilitate restoration of function and is now the standard of treatment for fractures of shaft of the forearm. This is supported by the good results of rigid plate fixation. The limited contact dynamic compression plates (LC-DCP), developed in 1991, was said to reduce the bone-plate contact by approximately 50% to minimise the disruption of periosteal blood vessels beneath the plate<sup>2</sup>. But the LC-DCP still relied on the plate-bone interface for stability and the problem of confluent contact areas was not completely resolved. Later on, the Point Contact Fixator (PC-Fix), which did not have surface contact with the bone but only point contacts, was developed. Locking compression plate (LCP) was devised by combining the features of a LC-DCP and a PC-Fix<sup>2</sup>. In LCP (Locking compression plate), the aim of which is to achieve the smallest surgical incision and to preserve blood supply to the bone and adjacent soft tissues and stability at the fracture site. The basic locked internal fixation technique aims at flexible elastic fixation to initiate spontaneous healing, including its induction of callus formation. With reference to the mechanical, biomechanical and clinical results, the new AO LCP with combination holes can be used, depending on the fracture situation, as a compression plate, a locked internal fixator, or as an internal fixation system combining both techniques. The LCP with combination holes can also be used, depending on the fracture situation, in either a conventional technique (compression principle), bridging technique (internal fixator principle), or a combination technique (compression and bridging principles). A combination of both screw types offers the possibility to achieve a synergy of both internal fixation methods. If the LCP is applied as a compression plate, the operative technique is much the same as conventional technique, in which existing instruments and screws can be used. The internal fixator method can be applied through an open but less invasive or a MIPO Approach<sup>3</sup>

## **II. Materials And Methods**

This was a single site study, carried out at Jubilee Mission Medical College , Thrissur between August 2013 to July 2015. Ethical clearance was obtained from the institute's ethical committee. There were 30 patients included in the study. All cases were diagnosed to be diaphyseal fractures of both bones of forearm. Compound fractures of forearm bones, Patients not willing for surgery, medically unfit for surgery patients below skeletal maturity, Patients with neurovascular deficits were excluded from the study. The limb was then immobilized in above elbow plaster of paris slab with sling. Medical fitness for surgery was obtained and all were fixed using 3.5mm LCP by a single surgeon. The bone which was less comminuted and more stable was fixed first and later the other bone was fixed<sup>4</sup>. The Radius was approached using Volar Henrys approach. Ulna was approached directly over the subcutaneous border. Intravenous antibiotic coverage was started 30 minutes prior to the skin incision and continued for 5 days postoperatively. Postoperatively an above elbow slab was applied over the affected forearm and arm pouch was given for one month. Patients were discharged with the forearm in arm pouch and advised to perform shoulder, finger movements. Patients were advised not to lift heavy weight or exert the affected forearm. Follow up was carried out at regular interval based on "Anderson et al " scoring system. Elbow movements and wrist movements<sup>4</sup> were noted and the union was assessed radiologically.

## **III. Results :-**

30 patients, 20 men and 10 women , diagnosed with diaphyseal fracture both bone forearm were treated with open reduction and internal fixation with LCP. The group's average age was 35 years. All surgeries were performed by a single surgeon, the senior most of the authors. There were no intra operative complications. The mean follow up period in our study was 12 months (5 -24 months) Using the 'Anderson et al' scoring system we had 70.4% patients with excellent results, 25.9% with satisfactory results and 3.7% non union. None of our cases underwent reoperations during the study period.

## **IV. Discussion :-**

Fracture of both bones of forearm presents a formidable challenge to the orthopaedicians as the various muscle forces acting upon the fracture tend to displace it, hence to provide the functional rehabilitation of the upper limb, anatomic reduction and rigid fixation is mandatory. In the present study we fixed 30 cases of diaphyseal fractures of both bones forearm with locking compression plate and screws and sought to evaluate their functional outcomes. In our study , we had 70.4% patients with excellent results, 25.9% with satisfactory results and 3.7% non union. In comparison , Anderson et al reported about 54 (50.9%) cases as excellent, 37 (34.9%) satisfactory, 12 (11.3%) unsatisfactory and 2(2.9%) failure<sup>5</sup>. Chapman et al reported 36(86%) cases as excellent, 3(7%) satisfactory, 1(2%) unsatisfactory and 2(5%) failure<sup>6</sup>. Frankie Leung reported 98% cases as excellent and 2% sarisfactory results<sup>6</sup>. Our series had 70.4% of excellent and 25.9% satisfactory results.

## **V. Conclusion :-**

We observed that the 3.5mm LCP, properly applied, is an excellent method for internal fixation of fractures of the forearm bone and results in excellent to good functional outcomes.

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