SUMMARY
SUMMARY

The management of forearm fractures has always been a test to the skills of the orthopaedic surgeon. Radius and ulna function as a unit like two wheels of cart. Maintaining axial and rotational alignment of both the bones and preserving the interosseous space during their reduction for treating their fractures, is essential for achieving proper functional results with good range of supination and pronation of forearm. There is inherent difficulty in reducing and maintaining the reduction of these two parallel bones due to the presence of strong supinating and pronating muscles.

Since time immemorial these fractures have been managed by correction of clinical deformity and application of wooden splints. Plaster of paris (POP) was introduced by Majithsen in, 1852, but was used for forearm fractures by Bohler in, 1929, for the first time. Later on detailed studies by Knight and Purvis (1949), Holdsworth (1949), Smith (1956) proved that closed reduction and external immobilization by POP cast resulted in high incidence of unsatisfactory results.

Due to unpredictable results and hazards of prolonged immobilization various workers studied and experimented with various techniques of internal fixation after open reduction with a variety of implants. The use of intramedullary implant for internal fixation was developed by Heygroves (1918), Lambrinudi (1939) and Kuntcher (1940). Rush and Rush (1937 and 1939) reported use of Stienmänn's pin for intramedullary internal fixation of
fractures of forearm bones. In 1959, Sage, introduced triangular forearm nails and reported good results with these nails. Talwalker (1964) improvised rigid solid square nails for radius and ulna and reported good results after using them.

The concept of treating diaphyseal fractures of both bone forearm with plates and screws was given by Lane (1906) and Lambotte (1907) but failures were frequent due to metal reaction and inadequate designs. Shermen (1913) introduced vanadium steel plate, Campbell and Boyd (1941) used autogenous tibial grafts as plates but failures were still common. The concept of compression at fracture site with the help of coapting screw was given by Danis (1949), Bagby and Janes (1958), but it was Muller's or AISF compression device used with Muller's plate developed by Muller, Allgower and Willineger (1961) which became very popular and is being used even now days. The dynamic self compressing plate (DCP) which obviated the need of separate compression device and needed less extensive dissection was developed by Allgower (1970) and this plate has been used in our study. These DCP were used successfully by Anderson (1975), Grace and Everermann (1980), Hadden (1983) and many others. Further advanced design of DCP named as Limited contact-Dynamic compression plate (LC-DCP) was developed by Perren et al in 1989.

Nowadays, square nail is the most popular intramedullary fixation device and DCP is the most commonly used plate with screws, used for fixing fractures of forearm bones. But, the specific
indication and quality of results with these two type of implants has not been clearly mentioned in literature. Thus we started with our present study to evaluate and compare the results of DCP versus intramedullary square nail in fractures of both bones of forearm. A total of 18 cases were included in this study from which 13 patients, after random selection, were treated by intramedullary square nail and 5 patients were treated by DCP fixation. Standard surgical techniques were used for operative open reduction and internal fixation. Henry's approach was used for exposing fractures of distal 2/3rd of radius and Thompson's approach was used for fractures of proximal 1/3rd of radius. Ulna was exposed by posterior subcutaneous approach. Radius and ulna were then internally fixed with either DCP or square nails, same implant being used for both the bones, according to standard techniques.

Patients were studied from the day of their admission through, pre, intra and post operative period to complete follow up with clinical and radiological assessment at successive visits till the patient achieved maximum possible functions of the injured limb. The data thus collected from patients of these two groups was analysed, evaluated and compared with each other. The quality of results and incidence of complications with these two type of implants were found to be similar to different studies by various authors. Then we went ahead to pursue the final aim of this study, i.e., to compare the results of DCP and intramedullary square nail fixation and to suggest their specific indications.
We used modified Anderson 1975 criteria for evaluating the quality of results in individual cases of our study, and finally we could conclude, that, anatomical alignment compression at fracture site and rigidity of fixation was better with DCP then with square nail fixation. Fracture union occurred swiftly and early, functional results were significantly better and the overall quality of results was better with DCP fixation as compared to square nail fixation. Few other important facts which came to light in this study were that, results were better when fracture was closed or simple, when there was no comminution at fracture site and when the duration of immobilization was short. Moreover this study also proved the excellent role of square nail fixation in segmental fractures of forearm bones.