SUMMARY

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This study was done to evaluate the use of callus distraction in leg length discrepancy using Kazem and Wagner bone lengthening devices . At first , we reviewed the different causes of leg length discrepancy , then , we mentioned different methods reported for equalization of leg length discrepancy whether shortening of the longer bone or lengthening of the shorter one and combined shortening of the longer bone and lengthening of the shorter one .

The historical review of limb lengthening traced back to the work of Codivilla , (1905) till the recently introduced callus distraction . The biologic principles of callotasis including the effect of corticotomy , latency period , distraction rate , consolidation period, stability of the device , and time of fixator removal . Also , we reviewed the histological appearance of lengthened human bone . Complications of limb lengthening were reported and analyzed .

In our study , 25 cases of leg length discrepancy (mostly due to old poliomyelitis and a few cases of congenital shortening) were operated upon using the method of callotasis and both Kazem and Wagner bone lengthening devices . These patients were 13 males and 12 females , the mean age at the time of the operation was 15.3 years with a mean shortening of 6.2cm .

The methods of pre-operative planning as well as surgical techniques including the surgical approaches ; pins insertion and the types of osteotomies done were discussed . Our results were assessed,

excellent results were achieved in 64% of cases . Good results were 16% of the cases and poor results were 20% of the cases . All segments healed without bone grafting or internal fixation .

The mean length gained was 5.1cm . The mean percentage of length gained was 14.9% . The mean fixator period was 206.6 days . Also , our results showed the mean healing index was 42.7 days and the mean healing index for poliomyelitis cases was 45.2 days while for congenital shortening cases was 24.3 days . The mean healing index for cases done by transverse corticotomy was 44.7 days , whereas for cases done by oblique osteotomy , it was 38.3 days . The mean healing index for patients of ten years of age or less was 33.7 days ; for patients more than 10 years of age up to 20 years , it was 45.1 days and for patients more than 20 years of age , it was 40.3 days . The mean healing index for femoral lengthening was 43.2 days, while for tibial lengthening , it was 40.5 days .

For cases distracted at a rate of 1mm once per day , the healing index was 42 days , whereas for cases distracted at a rate of 1.5mm once per day , it was 45.2 days .

Complications encountered in our series were 35 problems fully resolved by non-operative means ; two obstacles including one angular deformity and one fracture at the most proximal pin that required manipulation under anesthesia ; and 15 complications of which 7 angular deformities remained uncorrected , two patients had not achieved the desired length and one hip sublaxation .

Our results were discussed in comparison of published results and we came to conclusion that callus distraction is a satisfactory procedure that have a learning care and it deserves adequate selection of patients , good pre-operative examination and planning and meticulous attention to the details in surgery and after care .