Aim of this study was to evaluate the subjective and radiological outcome and to evaluate the complications of a medial closing wedge osteotomy at the femur for lateral osteoarthritis with genu valgum. Twenty-three patients with grade III to IV cartilage damage and valgus knee alignment were treated with medial closing wedge osteotomy at the distal femur. The osteotomy was stabilized with an internal plate fixator. Age varied between 25 and 55 years (mean 47 years). One patient was lost to final follow-up. After 3.5 years, all Knee Osteoarthritis Outcome Score (KOOS) subitems increased significantly. There was no significant difference in the subgroup analysis of KOOS subitems for patients with and without microfracture or age (>50 vs. <50 years). There were no perioperative complications. One patient had an overcorrection. All, but one osteotomy, showed stable bone healing. There was a loss of correction due to delayed bone healing in one case. Possible explanations for this complication were injury of the lateral cortex or smoking. This case required revision with bone graft and an additional lateral plate. In no case, a conversion to an endoprosthesis was necessary. The femoral medial closing wedge osteotomy is a surgical method for improving symptoms of lateral osteoarthritis in the valgus knee.