INTRODUCTION AND AIMS: Corticosteroids included in immunosuppressive protocols are traditionally thought to be the major culprit of bone mineral density loss in renal transplant recipients. In recent decades, steroid minimization immunosuppression protocols rapidly gained popularity. The present study aimed to investigate bone mass changes and correlates in contemporaneous de novo renal transplant recipients.

METHODS: Between 2006 and 2008, we enrolled 80 adult recipients of a single kidney transplant into a 5-year follow-up study. Bone mineral density (BMD), as assessed by dual energy x-ray absorptiometry at various skeletal sites (forearm, lumbar spine and hip), mineral metabolism parameters (including PTH, FGF23, sclerostin, calcidiol and calcitriol), and bone remodeling activity, as reflected by bone turnover markers (trimeric PINP, BAP, and TRAP5b), were monitored at time of transplantation, and 1 and 3 years post-transplantation. Cumulative methylprednisolone exposure amounted to 2.5 ad 5.6 g, at Yr1 and Yr5 respectively. Patients in whom bisphosphonates were initiated during follow-up (n=11) were excluded from the analysis.

RESULTS: Consistent with previous bone biopsy data, we observed an overall decrease of bone remodeling activity following transplantation. BMD changes in the overall cohort were minimal; we only observed a 2.2% (p=0.01) decline at the ultradistal
radius during the first postoperative year and a 2.6% (p=0.009) increase at the lumbar spine between Yr1 and Yr5. Of note, interval changes in bone remodeling activity and allBMD showed important interindividual differences. In regression analysis, bone remodeling activity, but not mineral metabolism parameters or cumulative corticosteroid exposure, associated consistently and independently with interval changes in BMD, both in the early and late posttransplant period. Patients with increasing bone remodeling activity after transplantation showed BMD loss, whereas those with decreasing bone activity showed BMD gain (ANOVA, p<0.05).

CONCLUSIONS: In conclusion, with current steroid minimization immunosuppressive protocols, BMD changes after renal transplantation are limited and related to bone remodeling activity rather than corticosteroid exposure.