

# Phosphate restriction preserves bone volume in early and late stages of CKD in rats

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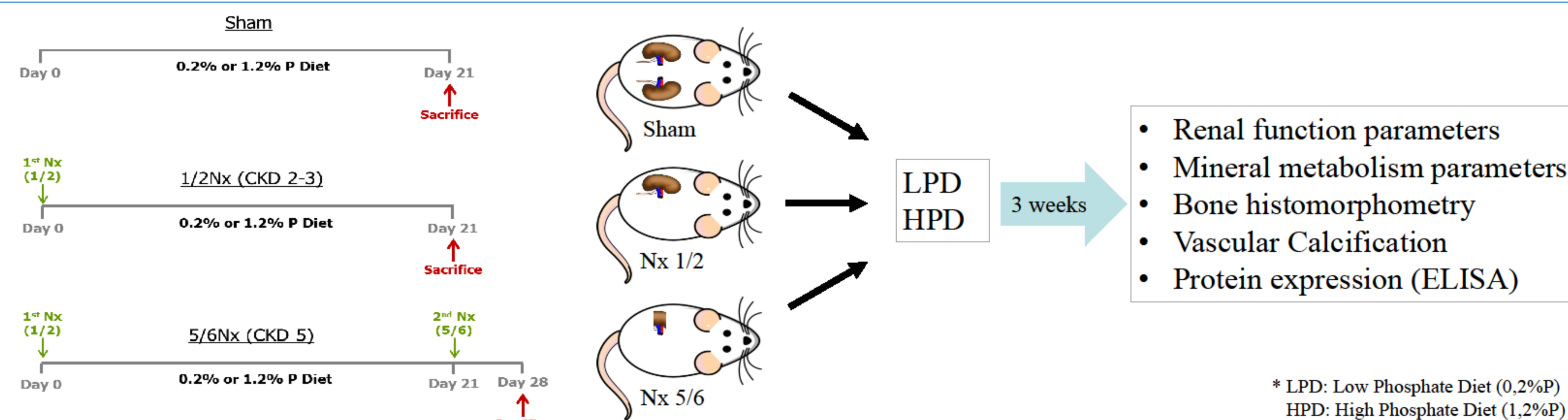
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## INTRODUCTION AND AIMS

Dietary phosphate restriction or phosphate binders may be beneficial in early CKD when serum phosphate is not yet elevated<sup>1,2</sup>. One question to be addressed is whether in early CKD there is any significant bone abnormality that could be improved by dietary phosphate restriction. The aim of the present study was to investigate the differential effects of high vs low phosphate diet on bone remodeling in uninephrectomized (Nx 1/2) rats as well as on advanced renal disease (Nx 5/6).

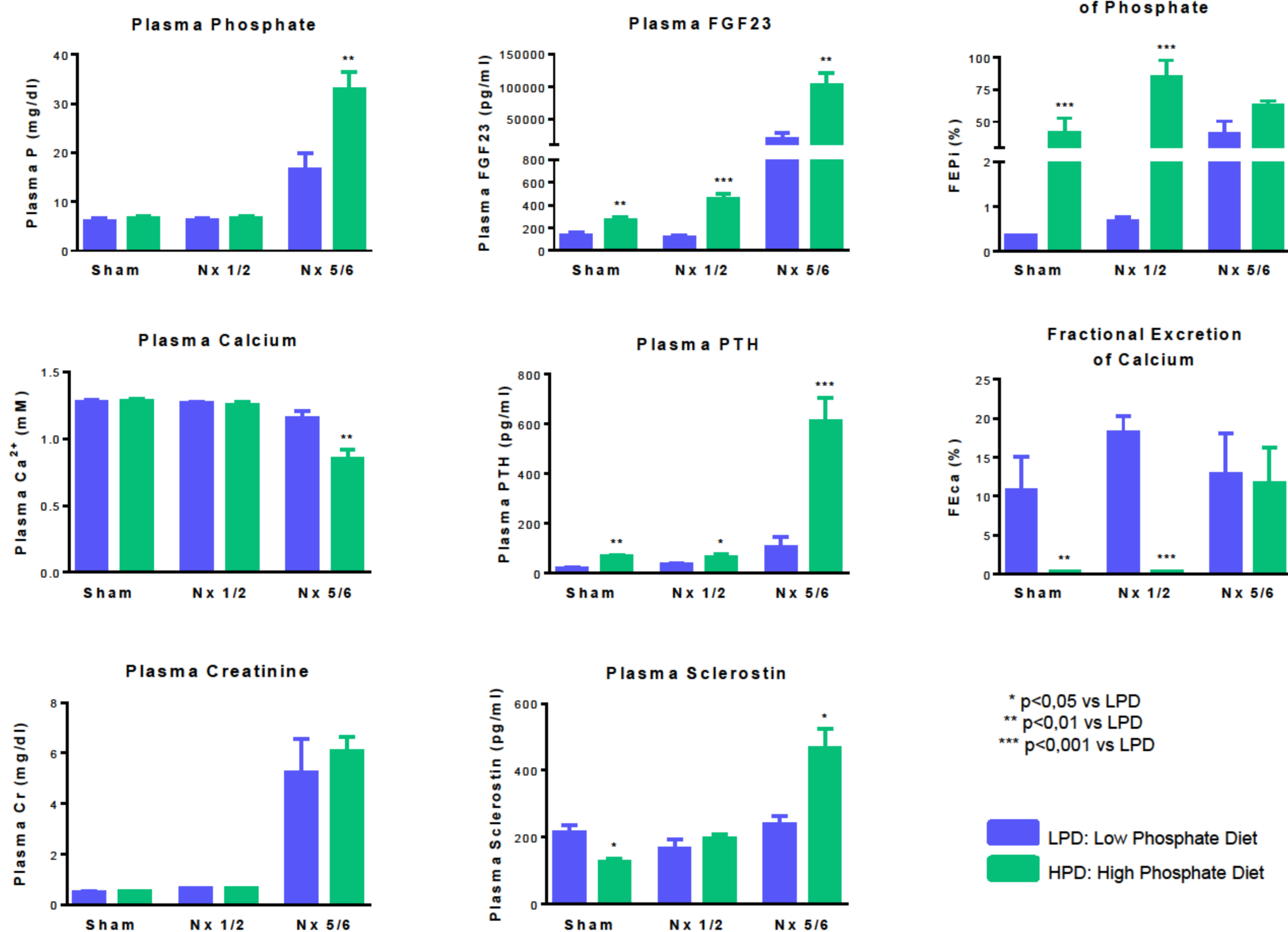
## METHODS

Sham and uninephrectomized (Nx 1/2) male wistar rats were fed a high phosphate diet (HPD, 1,2%P) or low phosphate diet (LPD, 0,2%P). Rats were euthanized after 3 weeks, blood was collected and bone (femur) was processed for histomorphometry. In order to investigate progression of bone disease with worsening of renal function, some of the Nx 1/2 rats underwent surgical removal of 2/3 of the remnant kidney and were kept in the same P diet. Rats were euthanized one week later.

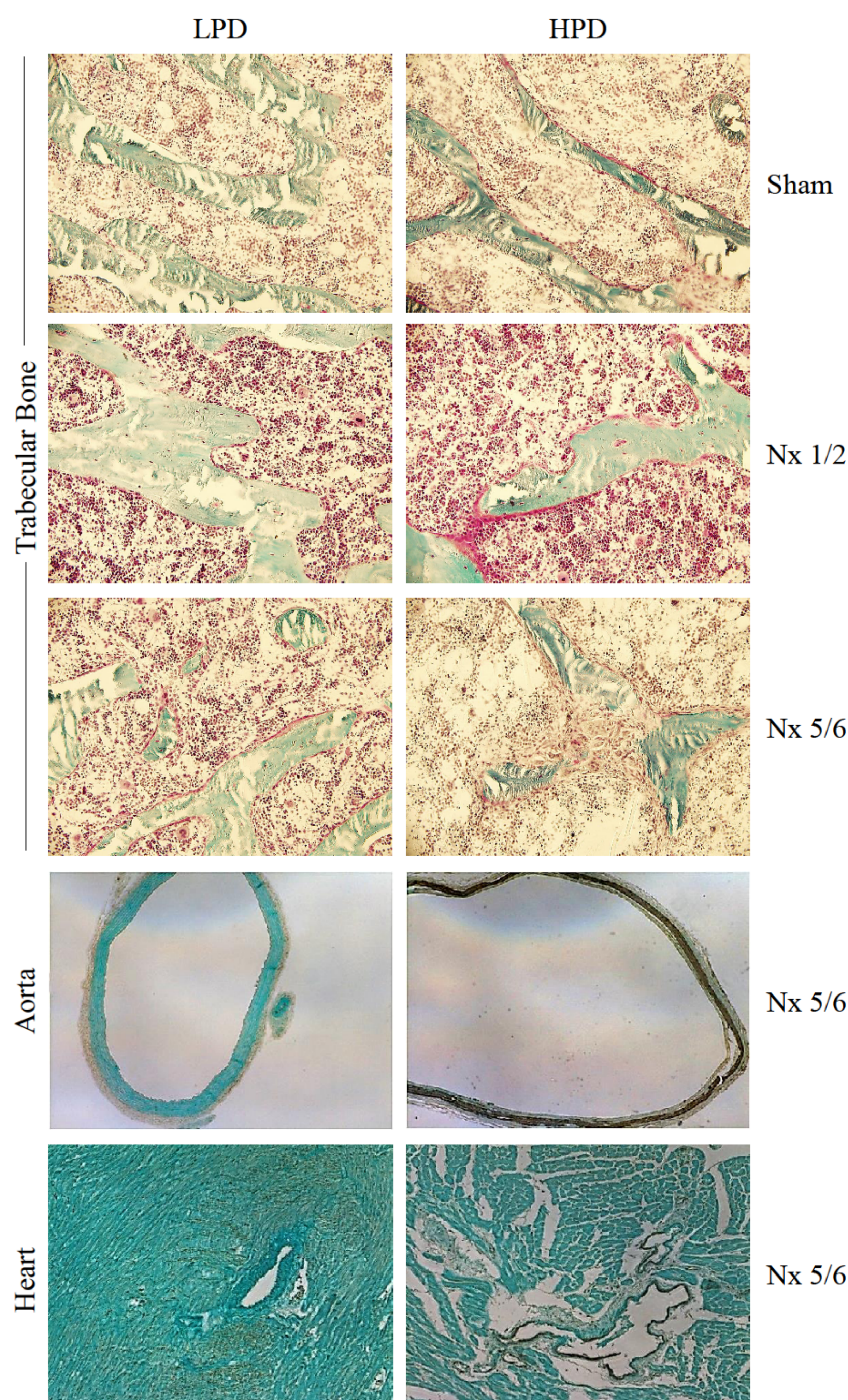


## RESULTS

### Renal Function and Mineral Parameters



### Bone histomorphometry and Vascular Calcification



### Bone Histomorphometrical Parameters

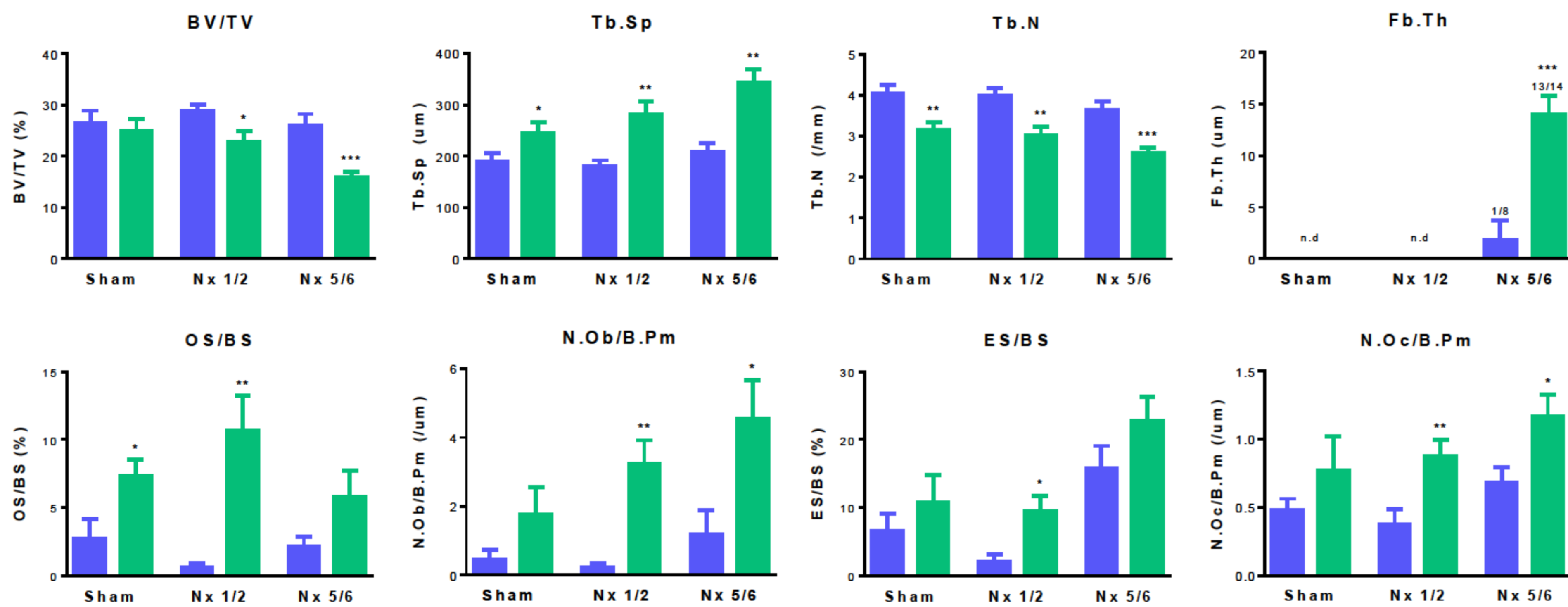


Figure 1. Histological analysis of trabecular distal femurs (Goldner's Trichrome), aorta and heart (Von Kossa).

## CONCLUSIONS

Phosphate restriction prevents bone abnormalities that are present in early stage of CKD, even when phosphate levels are in the normal range and deterioration of renal function is marginal.

## REFERENCES

- Block GA et al. J Am Soc Nephrol. 2012 Aug;23(8):1407-15.
- Oliveira RB et al. Clin J Am Soc Nephrol 5: 286–291, 2010.