Introduction
Parathyroid cancer (PC) is rare accounting for less than 1% of all presentations. Tumors that demonstrate atypical features and do not fulfill criteria for carcinoma can be classified as atypical adenomas (APA). Herein we aimed to evaluate the clinical and biochemical features of the patients with an atypical parathyroid adenoma or carcinoma and compare it with benign parathyroid adenomas

Methods
- Twenty eight patients who were operated for primary hyperparathyroidism and diagnosed with APA or PC were enrolled. Another 102 patients with classical PA were included as the control group. Classic adenomas, APAs and PCs were compared according to preoperative biochemical and ultrasonographic parameters

Results
- Serum Calcium (Ca) was significantly higher in the carcinoma group compared to APA and classical PA groups in post hoc analysis, (p<0.001 and p=0.010, respectively). Serum median parathormone (PTH) was significantly higher in the APA and the carcinoma groups compared to classical PA group (p<0.05). Serum (alkaline phosphatase) ALP and 24-hour urinary Ca excretion were significantly higher in the APA and PC groups compared to classical adenomas (p<0.001). Areas under ROC curve for Ca, PTH, ALP, 24 hour Ca excretion and the adenoma diameter were significant for discrimination of aggressive (APA and PC) from benign disease. Best cut off for Ca, PTH, ALP, 24 hour Ca excretion and the adenoma diameter were 12.45 mg/dl, 265.05 pg/ml, 154.5 IU/l, 348.5mg/day and 21.5 mm, respectively. Multivariate analysis showed that Ca, ALP and isoechoic/cystic appearance were independent predictors for aggressive disease

Conclusion
- Preoperatively high PTH, ALP and urinary Ca levels and large lesions with isoechoic or cystic appearance may be predictive for atypical adenoma or carcinoma that may require more extensive surgery and closer follow up to prevent any lifelong complications.