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Introduction & Objectives: To assess the prevalence of apical tumor involvement (ATI) in radical prostatectomy (RP) specimens and the diagnostic accuracy of biparametric magnetic resonance imaging (MRI) to detect apical tumor involvement (ATI) in the RARP specimens in daily clinical practice. If an adequate localisation of prostate cancer (PCa) on MRI is feasible, it may assist urologists in surgical planning of nerve-sparing surgery and apical dissection.

Materials & Methods: A retrospective cohort of consecutive patients with biopsy-proven PCa who underwent MRI and robot-assisted radical prostatectomy (RARP) between July 2015 and March 2020 was studied. Clinical, imaging, pathology, oncology and functional data were retrieved. The MRI definition of the apex was the caudal one-third and the pathology definition was the most distal one centimeter of the prostate. A comparison was made between MRI findings and pathology.

Results: ATI on MRI (radATI) was present in 121/177 (68%) patients. The pathologic prevalence of ATI was 91% (161/177). In 69% of cases (111/161), routine MRI correctly detected ATI in the RARP specimens. Apical positive surgical margins (PSMs) were observed in 43 (24%) patients. RadATI was significantly associated with positive surgical margins (PSMs) at the apex (OR 3.67 [95% CI 1.45-9.31], p=0.004) and remained an independent predictor in multivariate analysis. Patients with radATI that had extensive nerve-sparing had more apical PSMs (46%) than patients with radATI and limited nerve-sparing (21%, relative risk reduction 54%). The erectile function was significantly better when the nerves were spared extensively versus a limited approach (IIEF-EF 19 [IQR 8-20]) vs 2 [IQR 1-4.5], p<0.001).

Conclusions: The prevalence of apically located PCa is high in prostatectomy specimens. Unfortunately, the accuracy of MRI to detect pathological ATI and consequently reduce the incidence of PSMs is limited. Urologists performing RARP should limit the extent of nerve-sparing when rATI is present to prevent PSMs.