Background: ARID1A, a member of the chromatin remodeling genes family, has been suggested as a novel tumor suppressor gene in gynecologic malignancies. However, its role in penile cancer has yet to be determined. This study assesses the immunohistochemical expression of ARID1A in invasive penile squamous cell carcinomas (SCC).

Design: 112 cases of formalin-fixed paraffin-embedded penile SCC from Paraguay were used to build 4 tissue microarrays (TMA). Each tumor was sampled 312 times. Histologic subtyping and grading was done using recently published criteria (Hum Pathol 2012;43:771). ARID1A expression was evaluated by immunohistochemistry using a polyclonal rabbit anti-ARID1A (BAF250A) antibody (HPA005456, Sigma-Aldrich, St Louis, MO). An H score is calculated in each spot as the sum of expression intensity (0-3+) by extent (0%-100%). Median H score per case was used for statistical analysis.

Results: Distribution of subtypes was as follows: usual SCC, 48 cases; warty-basaloid carcinoma, 25 cases; warty carcinoma, 16 cases; basaloid carcinoma, 11 cases; papillary carcinoma, 9 cases; and 1 case each of sarcomatoid, verrucous, and usual-verrucous (hybrid) carcinomas. Distribution of histologic grades was as follows: grade 1, 5 cases; grade 2, 30 cases; grade 3, 77 cases. Human papillomavirus (HPV) DNA was detected by PCR in 20 of 52 (38%) analyzed samples. ARID1A expression was observed in all cases, ranging from 3% to 100% of tumor cells (median, 95%). In 96 cases (86%) ARID1A expression was observed in 90% or more of tumor cells. ARID1A expression was not associated with histologic subtype (P=0.79) or HPV status (P=0.18). However, the Kruskal-Wallis test yielded a P=0.054 for the association between ARID1A and histologic grade. The Cuzick test showed that this trend was significant (P=0.026).

Conclusion: ARID1A is expressed in penile SCC, in most cases at high levels. A significant trend was found between histologic grade and ARID1A expression, with higher ARID1A expression at higher histologic grades. The implications of our findings for penile cancer oncogenesis and prognosis merits further investigation.