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### **Malignant Meningiomas With Epithelial (Adenocarcinoma-like) Metaplasia: A Study of Three Cases.**

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#### **Abstract**

**BACKGROUND:** Meningiomas exhibit a wide range of histomorphologic features, including variable mesenchymal and epithelioid phenotypes. Meningiomas also represent the most common host tumors for systemic metastases, particularly carcinomas. Recently, however, three unique dural-based neoplasms were encountered, wherein malignant-appearing gland-like structures were intermixed with meningotheial elements, yet genetic data suggested epithelial metaplasia rather than metastatic carcinoma.

**OBJECTIVE:** To describe and characterize a rare meningioma pattern with potential diagnostic pitfalls.

**METHODS:** In addition to routine clinical, radiologic, and histopathological analyses, cases were studied with immunohistochemistry and fluorescence in situ hybridization (FISH) to elucidate the origins of two seemingly disparate tumoral components.

**RESULTS:** Immunohistochemistry confirmed an epithelial ontogeny of gland-like structures, with extensive CK7 positivity suggesting possible lung or breast primaries. However, identical losses of chromosomes 1p, 14q and 22q in meningotheial and epithelial components were identified by FISH, an observation consistent with a monoclonal derivation and supporting the diagnosis of malignant meningioma with adenocarcinoma-like metaplasia. Although this phenomenon was reminiscent of gland-like metaplasia in secretory meningioma, it differed in that the gland forming cells were cytologically malignant, formed extracellular rather than intracellular lumina, and were unassociated with pseudopsammoma bodies. Nevertheless, intermingled secretory and adenocarcinoma-like features were seen in one case, suggesting some relationship between these two forms of epithelial metaplasia.

**CONCLUSION:** Recognition of adenocarcinoma-like metaplasia in meningiomas can prevent a misdiagnosis of metastatic carcinoma, with all its associated implications for patient management.

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