Best Practices Recommendations in the Application of Immunohistochemistry in Testicular Tumors: Report from the International Society of Urological Pathology Consensus Conference

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The judicious use of immunostains can be of significant diagnostic assistance in the interpretation of testicular neoplasms when the light microscopic features are ambiguous. A limited differential diagnosis by traditional morphology is required for the effective use of immunohistochemistry (IHC); otherwise, the inevitable occurrence of exceptions to anticipated patterns will lead to “immunoconfusion.” The diagnosis of tumors in the germ cell lineage, the great majority of primary tumors of the testis, has been considerably facilitated over the past decade by IHC directed at developmentally important nuclear transcription factors, including OCT4, SALL4, SOX2, and SOX17, that are mostly restricted to certain tumor histotypes. In conjunction with other markers, a specific diagnosis can be achieved in most instances through a panel of 3 or 4 immunostains and often fewer. IHC among tumors in the sex cord-stromal group may produce a significant proportion of false-negative cases until more sensitive and equally specific markers are validated. The negativity of these tumors for the IHC stains used for germ cell tumors is key in the important distinction of neoplasms in these 2 general categories. In this review, the International Society of Urological Pathologists (ISUP) provides diagnostic guidelines in the form of algorithms to assist practicing pathologists confronting a differential diagnostic question concerning a testicular neoplasm. The goal of ISUP is to anticipate commonly encountered differential diagnoses and recommend an efficient and limited pattern of IHC stains to resolve the question.