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Platinum Priority – Guidelines

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The 2016 WHO Classification of Tumours of the Urinary System and Male Genital Organs—Part B: Prostate and Bladder Tumours

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Abstract

It has been 12 yr since the publication of the last World Health Organization (WHO) classification of tumours of the prostate and bladder. During this time, significant new knowledge has been generated about the pathology and genetics of these tumours. Intraductal carcinoma of the prostate is a newly recognized entity in the 2016 WHO classification. In most cases, it represents intraductal spread of aggressive prostatic carcinoma and should be separated from high-grade prostatic intraepithelial neoplasia. New acinar adenocarcinoma variants are microcystic adenocarcinoma and pleomorphic giant cell adenocarcinoma. Modifications to the Gleason grading system are incorporated into the 2016 WHO section on grading of prostate cancer, and it is recommended that the percentage of pattern 4 should be reported for Gleason score 7. The new WHO classification further recommends the recently developed prostate cancer grade grouping with five grade groups. For bladder cancer, the 2016 WHO classification continues to recommend the 1997 International Society of Urological Pathology grading classification. Newly described or better defined noninvasive urothelial lesions include urothelial dysplasia and urothelial proliferation of uncertain malignant potential, which is frequently identified in patients with a prior history of urothelial carcinoma. *Invasive urothelial carcinoma with divergent differentiation* refers to tumours with some percentage of "usual type" urothelial carcinoma combined with other morphologies. Pathologists should mention the percentage of divergent histologies in the pathology report.

Patient summary: Intraductal carcinoma of the prostate is a newly recognized entity in the 2016 World Health Organization classification. Better defined noninvasive urothelial lesions include urothelial dysplasia and urothelial proliferation of uncertain malignant potential.

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1. The new prostate tumour classification

The aim of this review is to summarize the new additions to the 2016 World Health Organization (WHO) classification (WHO "blue book") compared with the 2004 WHO classification, with emphasis on a new entity, new variants of acinar adenocarcinoma, and new imunohistochemical stains for diagnosis, grading, risk stratification, and molecular genetics of acinar adenocarcinoma of the prostate. The 2016 WHO classification of tumours of the prostate [1] is summarized in Figure 1.

1.1. *New entity: intraductal carcinoma*

Intraductal carcinoma is newly recognized as an entity in the 2016 WHO classification. This term has been used for several decades, dating back to at least 1985 [2], and it has been variably used to describe intraductal spread or in situ

WHO classification of tumours of the prostate

Epithelial tumours	
Glandular neoplasms	
Acinar adenocarcinoma	8140/3
Atrophic	
Pseudohyperplastic	
Microcystic	
Foamy gland	
Mucinous (colloid)	8480/3
Signet ring–like cell	8490/3
Pleomorphic giant cell	
Sarcomatoid	8572/3
Prostatic intraepithelial neoplasia, high-grade	8148/2
Intraductal carcinoma	8500/2
Ductal adenocarcinoma	8500/3
Cribriform	8201/3
Papillary	8260/3
Solid	8230/3
Urothelial carcinoma	8120/3
Squamous neoplasms	
Adenosquamous carcinoma	8560/3
Squamous cell carcinoma	8070/3
Basal cell carcinoma	8147/3
Neuroendocrine tumours	
Adenocarcinoma with neuroendocrine differentiation	8574/3
Well-differentiated neuroendocrine tumour	8240/3
Small cell neuroendocrine carcinoma	8041/3
Large cell neuroendocrine carcinoma	8013/3
Mesenchymal tumours	
Stromal tumour of uncertain malignant potential	8935/1
Stromal sarcoma	8935/3
Leiomyosarcoma	8890/3
Rhabdomyosarcoma	8900/3
Leiomyoma	8890/0
Angiosarcoma	9120/3
Synovial sarcoma	9040/3
Inflammatory myofibroblastic tumour	8825/1
Osteosarcoma	9180/3
Undifferentiated pleomorphic sarcoma	8802/3
Solitary fibrous tumour	8815/1
Solitary fibrous tumour, malignant	8815/3
Haemangioma	9120/0
Granular cell tumour	9580/0
Haematolymphoid tumours	
Diffuse large B-cell lymphoma	9680/3
Chronic lymphocytic leukaemia / small lymphocytic lymphoma	9823/3
Follicular lymphoma	9690/3
Mantle cell lymphoma	9673/3
Acute myeloid leukaemia	9861/3
B lymphoblastic leukaemia/lymphoma	9811/3
Miscellaneous tumours	
Cystadenoma	8440/0
Nephroblastoma	8960/3
Rhabdoid tumour	8963/3
Germ cell tumours	
Clear cell adenocarcinoma	8310/3
Melanoma	8720/3
Paraganglioma	8693/1
Neuroblastoma	9500/3
Metastatic tumours	
Tumours of the seminal vesicles	
Epithelial tumours	
Adenocarcinoma	8140/3
Squamous cell carcinoma	8070/3
Mixed epithelial and stromal tumours	
Cystadenoma	8440/0
Mesenchymal tumours	
Leiomyoma	8890/0
Schwannoma	9560/0
Mammary-type myofibroblastoma	8825/0
Gastrointestinal stromal tumour, NOS	8936/1
Leiomyosarcoma	8890/3
Angiosarcoma	9120/3
Liposarcoma	8850/3
Solitary fibrous tumour	8815/1
Haemangiopericytoma	9150/1
Miscellaneous tumours	
Choriocarcinoma	9100/3
Seminoma	9061/3
Well-differentiated neuroendocrine tumour / carcinoid tumour	8240/3
Lymphomas	
Ewing sarcoma	9364/3
Metastatic tumours	

The morphology codes are from the International Classification of Diseases for Oncology (ICD-O) {917A}. Behaviour is coded /0 for benign tumours; /1 for unspecified, borderline, or uncertain behaviour; /2 for carcinoma in situ and grade III intraepithelial neoplasia; and /3 for malignant tumours. The classification is modified from the previous WHO classification {756A}, taking into account changes in our understanding of these lesions.

Fig. 1 – World Health Organization (WHO) classification of tumours of the prostate. Reproduced with permission from the WHO [1]. WHO = World Health Organization.