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MINI-SYMPOSIUM: UROPATHOLOGY

A practical approach to the reporting of germ cell tumours of the testis

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Summary Germ cell tumours (GCT) present many different challenges for diagnostic histopathologists and a new classification by the World Health Organization has recently introduced some new entities. The accurate diagnosis of GCT is essential for appropriate treatment. Therapy is also influenced by staging and, therefore, careful macroscopic examination is vital. Many prognostic markers have been used, many of which are still contentious. Close co-operation with both the surgical and medical teams is vital for consistent treatment and the avoidance of misunderstandings. A number of entities may mimic GCT, leading to misdiagnosis.

The morphological appearances of GCT are particularly difficult to interpret if chemotherapy has already been administered. Many transformations of GCT may be seen including sarcomatous, carcinomatous and neuroendocrine malignancies. These require different treatment regimens and may arise many years after the primary excision.

Introduction

The treatment of testicular germ cell tumours (GCT) is a success story for modern clinical oncology. The most common malignancy in young men has become one of the most curable cancers, with a 5-year survival rate of greater than 90%. Cure of proven metastatic disease is no longer the exception, but the rule.

Pathologically, however, they can present diagnostic problems. This is due to their rarity, but also due to their amazingly protean morphology. Seminoma may mingle with yolk sac (YS), embryonal carcinoma (EC) and show differentiation towards adult tissues. These difficulties are compounded by problems of terminology, which may lead to dangerous misinterpretations.[1] Being on the same 'wavelength' as the oncologist and surgeon is vital. These problems are multiplied exponentially in cases that have received chemotherapy. The pathology of post-chemotherapy GCTs is still in its infancy.

GCT treatment in the 21st century is centred on the multi-disciplinary team. Tertiary referral

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centres now treat relapsed tumours and multimodality therapies are used in their treatment. Histopathologists have a duty, not just to write reports, but to liaise with the clinicians over disease locations, serum protein levels and their velocity, and to have a detailed knowledge of the past history and histology.

This article will attempt to give a relatively didactic guide to the examination of GCTs. A detailed and excellent article discussing the pros and cons of the many prognostic factors has been published relatively recently.[2] This article will concentrate on the examination of orchidectomy specimens and retroperitoneal lymph node dissections (RPLND), which are more likely to be problems for the practising histopathologist.

Macroscopic examination of the testis

Testicular tumours do not require complicated macroscopic protocols.[3] A primary consideration is the examination of sufficient blocks of tumour. One block per centimetre is mandatory together with a block of non-tumour. For staging purposes, the tunica is examined for invasion. For practical reasons, this is often best assessed macroscopically, as an uninvolved tunica slides satisfactorily over the testis on light palpation. Also, the outer layers inevitably float off the testicular body when cut, which can lead to over-staging. Involvement is suspected macroscopically when the tunica is invaded by tumour and therefore does not slide over the testicular parenchyma. Once sliced, the size of the tumour is measured. This is important as the tumour may be too large for microscopic measurement and size is a criterion in the decision for further therapy.

Seminomas are described traditionally as having a cut surface resembling a potato. However, they can be more liquefied than this, often leading to a 'splurge' of seminoma cells over the tunica, cord, cut-up bench and, occasionally, the dissecting pathologist. While the latter two can be treated for this condition, the presence of loose seminoma cells may cause over-staging problems by misinterpretation either as foci of tumour in fat or in vessels. Some, therefore, take the cord block before cutting the testis and also allow 24 h fixation time before slicing into the tumour. In reality, the cord margin is very rarely helpful in tumour staging. Vascular invasion, by far the most important staging criterion, is best seen adjacent to the tumour and vascular invasion at the cord margin is NOT stage T3. In fact, it should be noted that the criterion for T3 tumours just specifies 'cord invasion', not cord margin (Table 1). Solid lumps of tumour in the cord, not contiguous with the testis, are rare and are usually spotted by the wary prosector. The cord margin tends to cause excitement (and occasional misinterpretation) with the presence of adrenal rests, lipomas, Leydig cells around nerves, paraganglia and adenomatoid tumours but is otherwise of limited helpfulness. Blocks lower down in the cord may be more helpful.

Practice points

- Thorough sampling of the tumour is essential
- Prevention of spread of tumour cells on the cut-up bench must be avoided
- Size and correct staging are vital for treatment choices
- A 24 h fixation time helps prevent tumour carry-over

Table 1 Staging of germ cell tumours (TNM classification 2002).

Stage	
pTis	Intratubular germ cell neoplasia
pT1	Tumour limited to testis and epididymis without vascular invasion Tumour may invade tunica albiginea but not tunica vaginalis
pT2	Tumour limited to testis and epididymis with vascular invasion OR tumour extending to tunica vaginalis
pT3	Tumour invades spermatic cord
pT4	Tumour invades scrotum
N1	Metastasis involving 5 or fewer nodes less than 2 cm in maximum diameter
N2	Metastasis in more than 5 nodes, OR maximum diameter between 2 and 5 cm OR extra-nodal extention
N3	Metastasis greater than 5 cm in maximum diameter
M1a	Non-regional lymph nodes or lung
M1b	Other sites