Management of testicular tumors - an update

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Introduction

- Morphologically and clinically diverse group of neoplasms
- Management depends on histology
- Anatomy of the testis, lymphatic and vascular drainage
- Highly curable condition with excellent prognosis
- ‘a model for a curable neoplasm’
Recent advances

- Improvements in the clinical staging of testicular cancer
- Superior chemotherapy regimens
- Internationally agreed-upon consensus classification (1997) applicable to both seminoma and non-seminoma
- Quality of life (QOL) issues
Diagnosis

- Closely related to and equates management of primary
- Has remained the same
- Radical inguinal orchidectomy
- Early high ligation of the spermatic cord
Biology

- Unique system for study of mechanism of transformation of a totipotential germ cell in lineage differentiation
- Pluripotential tumor cell manifests as different phenotypes
  - Seminoma
  - Embryonal carcinoma
  - Teratoma
  - Choriocarcinoma / yolk sac tumor
Molecular mechanisms

• Over expression of cyclin D2 – early, possibly oncogenic event in germ cell tumorigenesis
• Differentiation may be governed by loss of regulators of germ cell totipotentiality and embryonic development and genomic imprinting
• Response to chemotherapy may be rooted in a p53 dependent apoptotic pathway
Staging

- Physical examination
- Pathological examination of the primary tumor
- Tumor markers
- Radiographic studies
Anatomic considerations

Primary ‘landing zones’ of
Right testicular tumors
• Inter aortocaval nodes
• Paracaval, preaortic, rt common iliac nodes

Left testicular tumors
• True para aortocav nodes
• Paracaval, preaortic, lt common iliac nodes
Anatomic considerations

- Metastatic nodal disease in iliac or inguinal nodes – usually secondary to large volume disease with retrograde spread
- Contralateral nodal disease is more common with right sided tumors and usually in the setting of large volume disease
Tumor imaging

- Chest radiograph
- Computed tomography
- Magnetic resonance imaging
- Lymphangiography
- Positron emission tomography
Serum tumor markers

\textit{α feto protein}
- Non seminomatous histology

\textbf{Human chorionic gonadotropin}
- \(\beta\) subunit – pure seminoma and NSGCT

\textbf{Lactate dehydrogenase}
- Independent prognostic significance
Good prognosis with all of Non-seminoma
- Testis/retroperitoneal primary
- No non-pulmonary visceral metastases
- AFP < 1000 ng/ml
- HCG < 5000 iu/l
- LDH < 1.5 X upper limit of normal range
Good prognosis with all of Seminoma

- Any primary site
- No non-pulmonary visceral metastases
- Normal AFP
- Any HCG
- Any LDH
Intermediate prognosis with all of Non-seminoma

- Testis/retroperitoneal primary
- No non-pulmonary visceral metastases
- AFP > 1000, <10,000 ng/ml or
- HCG > 5000, <50,000 iu/l or
- LDH > 1.5 X N and < 10X N
Intermediate prognosis with all of Seminoma

- Testis/retroperitoneal primary
- Non-pulmonary visceral metastases
- Normal AFP
- Any HCG
- Any LDH
Poor prognosis with any of
Non-seminoma
- Mediastinal primary or
- Non-pulmonary visceral metastases or
- AFP > 10,000 ng/ml or
- HCG > 50,000 iu/l or
- LDH > 10X upper limit of normal range
International Germ Cell Cancer Collaborative Group Consensus Classification - 1997

No patients with seminoma are classified in the poor prognosis group
Stage I NSGCT

• Surgery vs surveillance
• Standard of care is either retroperitoneal lymph node dissection (RPLND) or close surveillance with cisplatin based chemotherapy in case of relapse
• Both treatment modalities have excellent overall survival results of up to 100%
Stage I NSGCT

Treatment is decided based on

• Treatment related morbidity
• Views and expertise of treating physician
• Patient preferences
• Expected degree of patient compliance
• Prognostic factor analysis
Stage I seminoma

- Immediate adjuvant para aortic and ipsilateral pelvic radiotherapy
- Close surveillance with treatment if relapse

Ongoing research
Reducing side effects of treatment by
- Modifying radiotherapy treatment plan
- Adjuvant chemotherapy instead of RT
Stage II & III seminoma

- Stage II with small volume retroperitoneal lymphadenopathy – Radiotherapy
- Good long term disease control

- Bulky stage II and stage III
- Cisplatin based chemotherapy
**Disseminated NSGCT**

- Majority can be cured with cisplatin based chemotherapy
- ‘Gold standard’ regimen of Cisplatin, Etoposide and Bleomycin (BEP)

**Ongoing research**

- Taxol as first line chemotherapy
- High dose Etoposide and Ifosfamide with autologous hematopoietic support
Summary

• Testicular tumors have an excellent prognosis - most patients are curable
• Risk stratification based on the Consensus classification 1997
• Excellent results even in disseminated and recurrent germ cell tumors
• Further research to reduce toxicity of treatment and improve quality of life
Thank you