free survival in *ALK+* patients, similar to EGFR TKI use in patients with *EGFR* activating mutations. Molecular testing of patients for *ALK* gene fusions presents unique challenges given the low frequency of this genetic aberration. Unique characteristics of *ALK+* NSCLC patients will be discussed. Patients with *ALK+* NSCLC display distinct patterns of metastatic spread. Data from our institution suggest improved outcomes with pemetrexed in *ALK+* patients compared to other molecular cohorts. Finally, mechanisms of resistance in *ALK+* patients treated with crizotinib and strategies to overcome resistance will be addressed. The experience with *EGFR* and *ALK* oncogenes will be critical as clinical trials seeking to evaluate targeted therapies for other oncogenes in NSCLC such as MET, HER2, FGFR and BRAF proceed. Redefining lung cancer by its molecular characteristics may help us understand patterns of spread, response to targeted and non-targeted therapy and common approaches to drug resistance.

Special Session (Mon, 26 Sep, 13:15–14:15)
Circulating Tumour Cells

302 INVITED

Technological Approaches for CTC Detection

Abstract not received

303 INVITED

Circulating Tumour Cells

K. Pantel[1]. [1]*University Medical Center Hamburg-Eppendorf, Department of Tumour Biology, Hamburg, Germany*

Blood-borne tumour cell dissemination to distant organs can start early in cancer patients and micrometastatic spread of cancer cells is usually undetected by current imaging technologies. Therefore, sensitive methods have been developed to detect circulating tumour cells (CTC) in the peripheral blood and disseminated tumour cells (DTC) in the bone marrow at the single cell level. Interestingly, the bone marrow seems to be a common homing organ for cells derived from various epithelial tumours including breast and prostate cancer (Braun et al., NEJM 2005; Koellermann et al., JCO 2008). However, a significant fraction of DTC remain over years in a "dormant" stage, and little is known about the conditions required for the persistence of dormancy or the escape from the dormant phase into the active phase of metastasis formation Pantel et al., Nat Rev Cancer 2008 & Nat Rev Clin Oncol 2009). Sequential peripheral blood analyses, however, are more convenient for patients than BM analyses and many research groups are currently assessing the clinical utility of CTC for assessment of prognosis and monitoring of systemic therapy. In particular, monitoring of CTC during and after systemic adjuvant therapy might provide unique information for the clinical management of the individual cancer patient and allow an early change in therapy years before the appearance of overt metastases signals incurability. Ther e is an unmet need for biomarkers for real-time monitoring of the efficacy of systemic adjuvant therapy in individual patients. At present, the success or failure of anti-cancer therapies is only assessed retrospectively by the absence or presence of overt metastases during the post-operative follow-up period. However, overt metastases are, in general, incurable by most current therapies. The monitoring of CTC as "liquid biopsy" will provide new insights into the selection of tumour cells under biological therapies. CTC analyses are therefore incorporated into many current clinical trials testing new anti-cancer agents as companion diagnostics. Interestingly, cell-free nucleic acids released by CTC might become valuable biomarkers of micrometastatic disease in the future (Schwarzenbach et al., Nat Rev Cancer 2011). In conclusion, molecular characterization of DTC and CTC opens a new avenue for understanding metastatic spread of tumour cells with important implications for future therapies.

304 INVITED

Markers for Circulating Tumour Cells

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The two main potentials for CTC detection are in enumeration and characterization. In recent years, CTC enumeration prior to treatment start has been shown to provide prognostic information in several tumour types and settings. Though there are no data showing that patients should receive different treatments according to their CTC count at baseline, given the strong association of CTC numbers with outcome the implementation of CTC enumeration as a stratification factor should be considered in clinical trials for some tumour types.

Furthermore, CTC enumeration can serve as an early marker to evaluate response to anti-tumour drugs. Clinical trials are ongoing to assess whether systemic therapy in cancer patients can be tailored according to CTC counts instead of conventional radiological techniques. Meanwhile, CTC enumeration has been implemented in clinical studies to assess the anti-tumour activity of novel treatment approaches early.

In addition to CTC enumeration, characterisation of CTC holds great promise. With the advent of molecularly targeted agents, molecular characterization of tumours is increasingly determining the type of treatment for cancer patients. Characterization is nowadays mainly done on primary tumour material. But characteristics between primary tumour tissue and metastatic lesions can largely differ while tumour characteristics change over time because of genomic instability of tumours. As a result, repetitive biopsies of metastatic tumour cells are likely to be required for determining the most appropriate treatment. As taking biopsies from solid metastatic lesions is a cumbersome procedure and frequently not possible because of the location of the metastases, CTC isolation is an attractive alternative serving as a liquid biopsy. There are already several techniques in place for CTC characterization including immunohistochemistry (eg HER2, ER, EGF-R) and FISH (HER2, androgen-receptor). The first studies have been initiated to explore whether treatment with molecularly targeting drugs can be based on characteristics of CTC rather than of the primary tumour. Techniques allowing high throughput CTC characterization would be very useful to further investigate the value of CTC characterization. However, CTC isolation by the currently available CTC techniques in general yield samples containing only a few CTC while being contaminated by leucocytes. This clearly hampers CTC characterisation by sensitive techniques such as PCR since positive signals can also be from leucocytes. By using a set of genes with no or only minor expression by leucocytes, we are able to perform quantitative mRNA and miRNA expression in as little as 1 CTC spiked in healthy donor blood. Additionally, epithelial-specific PCR signals could only be found in patients with detectable CTCs and not in healthy controls. Studies are ongoing to assess whether CTC characterization for mRNA or miRNA has indeed clinical value and gives more insight into tumour biology.

The field of CTC enumeration and characterization is rapidly evolving and it is likely that CTC enumeration and characterization will get a place in the standard patient management of several tumour types shortly.

Special Session (Mon, 26 Sep, 13:15–14:15)
Management of Retroperitoneal Sarcoma

305 INVITED

Differential Diagnosis of Retroperitoneal Sarcoma

Abstract not received

306 INVITED

Surgical Management of Primary Retroperitoneal Sarcomas: Improving Outcomes

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Background: The retroperitoneum represents a complex potential space with multiple vital structures. Complete surgical resection offers the only opportunity for cure in patients with primary retroperitoneal sarcomas. The development of local recurrence after surgical resection is the main cause of disease-related mortality. The aim of this study was to analyse predictors of local recurrence and disease-specific survival within the context of current surgical treatment.

Methods: A prospectively kept sarcoma database was reviewed to identify patients who underwent surgery for primary retroperitoneal sarcoma between 1990 and 2009. Patient demographics, operative outcomes and tumour variables were correlated with local recurrence and disease-specific survival. Multivariable analysis was performed to evaluate predictors for local recurrence and disease-free survival. A literature review was performed to investigate current strategies to improve outcome of surgery for retroperitoneal sarcomas.

Results: Two-hundred patients underwent surgery at the Royal Marsden Hospital for primary RPS. The median weight of tumours was 4.0 kg and median maximum diameter 27 cm. Macroscopic clearance was achieved in 170 patients. Resection of adjacent organs was required in 126 patients. Postoperative mortality rate was 3 per cent. Seventy-five patients developed local recurrence during follow-up. The 5-year local recurrence-free survival was 55 per cent. The 5-year disease-specific survival was 69 per cent. The inability to obtain macroscopic clearance at resection and high-grade tumours were significant predictors for local recurrence and disease-specific survival. Current literature focus on the extent of surgical resection,

the role of radiotherapy and the importance of high-volume centres to improve outcomes, and a review of the evidence is presented.
Conclusions: Complete macroscopic excision should be the goal of surgical resection. The ability to achieve a complete resection combined with tumour grade are the most important predictors of local recurrence and overall survival. A systematic extended resection of involved adjacent organs to achieve negative margins is safe and may improve local control and is best performed in high-volume centres by a multidisciplinary sarcoma team. The role of radiotherapy needs to be investigated in a prospected randomised fashion to establish the appropriate place in the management of retroperitoneal sarcoma.

307 INVITED

The Role of Radiotherapy in Retroperitoneal Sarcoma

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A retroperitoneal sarcoma (RPS) is a rare malignancy. It comprises about 15% of all soft tissue sarcomas. Although RPS is diagnosed at a median size of 15−18 cm, they remain asymptomatic for a relatively long period. The majority (70%) of RPS is either a liposarcomas or a leiomyosarcomas and 60% of them are of high grade histology.
The chance to obtain negative margins in these large tumours is small. In 40−50% of cases the surgeon has to leave macroscopic tumour behind (R2 resections). This accumulates into a local failure rate of 52−60% at 5 years. Predictive factors for local recurrence are grade, margin status, the fact whether patients have been operated upon in reference centers and whether or not radiotherapy (XRT) has been applied.
The cause of death in patients with extremity sarcomas (ESTS) is most often metastatic disease. In contrast, most RPS patients die due to local failures. In order to obtain the highest probability of abdominal control complete resection with gross negative margins and aggressive en bloc resection of the primary disease is now considered standard of surgical care.
What is the role of XRT in RPS and are aspects from XRT in ESTS applicable to RPS? In contrast to ESTS it is almost impossible to perform postoperative XRT due the high complication rates of the small intestines, kidneys and liver. Possibly the best timing of XRT is preoperative. In the presentation XRT trials and studies focused on RPS are discussed.

Special Session (Mon, 26 Sep, 13:15−14:15)
Optimal Care in Rare Cancers

308 INVITED

Palliative Care Issues in Patients With Brain Tumours

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Primary brain tumours belong to the rarer neoplasms with less than 2% of the newly diagnosed cancers. One fourth to one third of these are highly malignant gliomas with an overall dismal prognosis. Due to the lack of curative treatment options for many patients with primary brain tumours and their reduced life expectancy, good palliative care is essential. Brain tumours often lead to serious deterioration of neurological and cognitive functions. Besides the existential distress, patients and their families suffer from fears that this condition may lead to a change or loss of individual control, cognition or consciousness, as well as the patients' personality.
Despite undisputable proceedings in therapy the options to limit the progression of the disease for the majority of patients with malignant brain tumours are limited. Therefore the management has to focus on the best possible palliation. To meet the specific palliative care needs of these patients appropriately, a more detailed evaluation of this specific group is required. Recent data shows that patients with incurable primary brain tumours have disease specific palliative care issues that diverge clearly from a general palliative care population. Patients with primary brain tumours had evidence of more advanced disease such as poorer performance status and higher levels of nursing support. The predominance of disorientation and confusion in patients with primary brain tumours often leads to serious overburden in families and raise the need for social support. This is a major issue in families who care for patients with brain tumours, far more than in the care for the general palliative care population. Confusion impacts significantly on the social structures, as it aggravates high levels of distress in family members.
Specific palliative care problems in patients with brain tumours reveal the need for an appropriate provision of interdisciplinary and multiprofessional care in this patient population, with a particular view on the needs of the family caregivers and an early integration of social and psychological support.

309 INVITED

Kidney Cancerssystematic Symptom Assessment and Evidence Based Care for Patients With Renal Cell Carcinoma That Undertake Treatment With Tyrosine Kinase Inhibitors, TKI

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An important question in clinical cancer care is how to develop powerful and effective strategies to provide up to date evidence based care along with the fast development of new antitumoral drugs.
Historically, renal cell carcinoma, RCC, has been viewed as a therapy-resistant cancer. The recent development of targeted agents, such as tyrosine kinase inhibitor (TKI), has dramatically improved the outcomes in renal cell cancer treatment. The development of TKI has led to new challenges in cancer care related to the specific side effects that occur with treatment. The most common side effects are related to the skin especially hand and feet and symptoms from the oral mucosa. Even if the side effects not are life threatening, the problems can effect the patients physical, psychological and social wellbeing. Further more the side effects can lead to dose reduction and cause disruption in the treatment witch can have negative effect on survival for the patient. Adequate assessment of symptoms is important so that treatment of side effects can be adequate and effective. At the oncology department of the Karolinska University Hospital approximately 50 new patients with RCC are seen every year and an increasing number are treated with TKI.
The aim of this project is to evaluate the effect of interventions that nurses provide to treat TKI related side effects and to develop a systematic subjective symptom assessment using the Memorial Symptom Assesment Scale, MSAS, and to compare it with the assessment done with the CTCAE v 3.0. The aim is further on to delvelop evidence based interventions for the symptoms and side effects related to treatment with TKI.

310 INVITED

Addressing the Needs of Head and Neck Cancer Patients and Survivors

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Background: Optimal care for patients treated for rare cancers like malignancies of the head and neck presents a dual challenge imparted by rarity. Rarity imposes the difficulty of generating sufficient evidence to guide care. It also generates obstacles in creating expertise among treating clinicians. Wide variability in head and neck cancer incidence globally along with diversity among this anatomically grouped set of diseases creates an additional layer of intricacy, furthering the challenge of optimal care.
Materials and Methods: This paper relies on composite evidence to outline optimal care for people with head and neck cancer. An integrative review of current advances in biomedical and surgical care as well as symptom management and supportive care anchors the analysis. The author's qualitative research in head and neck cancer treatment and survivorship experience and clinical practice augment the review.
Results: The landscape of head and neck cancer treatment is rapidly evolving. The dominant surgically focused paradigm in which function and quality were commonly sacrificed for survival advantages is being replace with a multimodality paradigm in which chemo-radiotherapy as well as minimally invasive surgical options offer options that preserve function and quality in daily life. Advances in understanding viral and other mechanisms enhance the precision and effectiveness for some head and neck cancers. Concomitant advances in symptom management, supportive and palliative care as well as psycho-oncology lag behind biological, biomedical and surgical gains.
Conclusions: The gaps in evidence burdens clinicians and patients alike, generating individual needs, best practice solutions, and pressing need for research in symptom management, supportive and palliative care as well as psycho-oncology. Strengths in evidence-based practice are highlighted to derive a research agenda to promote optimal care.