The 34th Meeting of the **Scandinavian Sarcoma Group** **30 Years' Jubilee**

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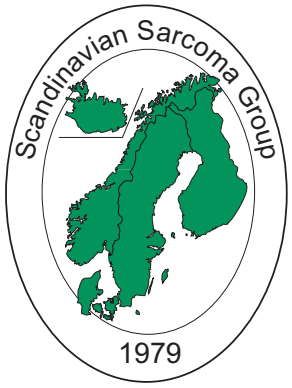

Abstracts

L1 Minisymposium: The role of trabectedin in the treatment of soft tissue sarcoma

J-Y. Blay
Dept of Oncology, University hospital, Lyon, France

L2 The role of conventional and functional imaging in sarcomas

D. Vanel
The Rizzoli Institute, Bologna, Italy

For 30 years, imaging of sarcomas has completely changed, allowing a more precise and conservative surgery, a more accurate evaluation of treatments, an earlier detection of recurrences. Sonography (for the soft tissues), CT, MR and PET are used routinely.

In Bone Tumors plain radiographs remain the first step, allowing to diagnose the "leave me alone" lesions. In case of doubt, CT allows the study of dense bone, detection of small calcifications, density measurements, especially in short and flat bones and can accurately guide a biopsy. MR is the most accurate technique for staging. The level of the resection, epiphyseal plate, skip lesions, vessels and muscles are well studied. The main limitation is joint involvement. Dynamic MR gives an accurate mapping of the viable tumor, but only late (just before surgery). PET may bring earlier pieces of information.

In Soft Tissue Tumors, the main imaging problem is to think of a possible sarcoma. All tumors larger than 5 cm, or deep or in children must be considered as a possible sarcoma and managed accordingly. Sonography and mainly MRI are the imaging diagnostic modalities, MRI is used for staging, sonography or CT for guided biopsy. Dynamic MR is accurate for treatment evaluation and MR for detection of recurrences, CT is the best technique for pulmonary metastases detection, bone scintigraphy or whole body MR for bone metastases. The exact role of PET is still under investigation.

L3 Treatment of Ewing´s sarcoma: current standard and future aspect

H. Jürgens

University Children's Hospital Münster, Dept of Paediatric Haematology and Oncology, Münster, Germany

Ewing's sarcoma is the second most common bone tumor in children and adolescents. Today classical Ewing's sarcoma is considered part of a group of tumors which includes skeletal and extraskeletal Ewing's sarcoma, Askin tumour of the chest wall, and peripheral primitive neuroectodermal tumour, also known as peripheral neuroepithelioma. Ewing's sarcomas are histologically characterized by small blue round malignant cells expressing CD 99/MIC-2 and by specific chromosomal translocations involving the EWS gene on chromosome 22 and several members of the ETS family of transcription factors, most commonly t(11;22)(q24;q12), which leads to the formation of the EWS-FLI1 fusion protein.

With current multimodal treatment regimens, including chemotherapy and local therapy (surgery with or without radiotherapy, or definitive radiotherapy) approx. 70% of patients with localized disease can be cured whereas survival rates of patients with metastatic disease at diagnosis and those with early relapse remain poor. Currently used chemotherapeutic agents primarily include alkylating agents, cyclophosphamide or ifosfamide, anthracyclines, mainly doxorubicin, and also vincristine, dactinomycin, and etoposide. High-dose chemotherapy regimens followed by autologous stem cell transplantation are under evaluation in patients with high risk at relapse by several cooperative groups. For local control there is an advantage of surgery over radiotherapy, in particular in large tumors and tumors with poor response to initial chemotherapy. All conventionally used chemotherapy agents aim to damage DNA synthesis, block DNA synthesis, or interfere with cell mitosis. As such these drugs lack selectiveness and affect dividing cells with increasing doses and intensity, requiring a careful balance between effectiveness and cytotoxic adverse events. More effective therapeutic options for the treatment of tumors resistant to conventional chemotherapy are needed. Most promising at present seem antibodies targeting the insulin-like growth factor 1 receptor as Ewing´s tumor cell survival and proliferation seem to depend on this pathway. Phase II studies are now ongoing. Hopefully the results may augment the therapeutic armamentarium for this group of tumors in the near future.

L4 Chondromatous tumors-from benign entity to highly malignant chondrosarcomas

P.C.W. Hogendoorn

Dept of Pathology, University hospital, Leyden, The Netherlands

L5 Osteosarcoma. Multidisciplinary management: The pathologist’s perspective

A.K. Raymond, N.X. Chen

M.D. Anderson Cancer Center, Houston, Texas, USA

Osteosarcoma (OS) is the most common non-hematological malignancy primary in bone. It may arise in any bone, at any age, and affects both genders. However, as with most bone tumors, OS has certain demographic propensities; it tends to affect men more often than women (M:F:;3:2), most frequently in the second and third decades. OS most frequently arises from the metaphyses of appendicular long bones; in particular the distal femur, proximal tibia and proximal humerus. Radiographically, OS forms destructive lesions that run the gamut from purely radiolucent to purely radioopaque and frequently extend beyond the confines of cortex. OS is not a single disease, but a family of histologically variable, and biologically divergent malignancy in which the production of osseous matrix by malignant cells is the single unifying parameter. OS may be divided into two major groups: conventional OS and variants representing 75% and 25% of cases respectively. The numerous variants may be viewed as belonging to one of three groups: those forms of OS defined by clinical parameters; those forms of OS that are defined by histological parameters; and those forms arising in association with the cortex. Treatment of high-grade forms of OS invariably consists of a combination of pre-operative chemotherapy, surgery and post-operative chemotherapy. While many parameters impact prognosis (e.g., tumor size and location, patient age and gender), response to pre-operative chemotherapy constitutes the most powerful prognostic indicator. The OS differential diagnosis is extremely broad and can be divided into two major groups: those entities, which follow traditional histological parameters and those that violate the definition of osteosarcoma.

L6 Demographic study of 1500 osteosarcoma patients

P. Picci

Istituto Ortopedico Rizzoli, Bologna, Italy

Introduction: Since the introduction of pre-operatory chemotherapy, no major improvements have occurred in osteosarcoma treatment. I have analyzed the overall survival over 21 years (1982–2002), with a 5-year minimum follow-up, in the largest series from a single centre ever reported.

Patients and methods: All diagnoses of high grade osteosarcoma were included irrespective of histology varieties, age, site and stage. Of the 1656 cases observed, 198 patients were excluded (41 consultation only, 129 low-grade varieties and 28 lost to follow-up). Within 1456 included patients, 1032 had characteristics to be enrolled in conventional clinical trials (classic histology, age <41, localized and extremity disease). Data are also analyzed in subgroups to define patients who benefited most.

Results: With a median follow-up of 12 (5–25) years, 754 patients (52%) are alive, 613 continuously disease-free. Survival at 5, 10, and 15 years is 57%, 52%, and 51% respectively.

Patients who fulfilled criteria for clinical trials had a survival rate of 68%, 64%, and 61% respectively. Survival for the other patients was 30%, 25%, and 24% respectively.

There was a yearly statistically significant improvement (jointpoint statistical analysis at real 5-year follow-up) of 1.31% (95% CI 0.5–2.1) from 51% for patients treated in 1982 to 68% for those treated in 2002 (Figure 1). Within the subgroups, survival statistically improved in patients candidates to trials, those who relapsed, or presented with metastatic disease at diagnosis, or had axial tumors. There was a statistically significant increase in the percentage of limb salvage procedures without an increased rate of local recurrences (Figure 2).

Conclusions: Despite the lack of new drugs for osteosarcoma, survival has statistically improved, especially for those patients with the worst outcome. Centralization of patients and aggressive treatments are recommended for all patients including those with poor prognosis.

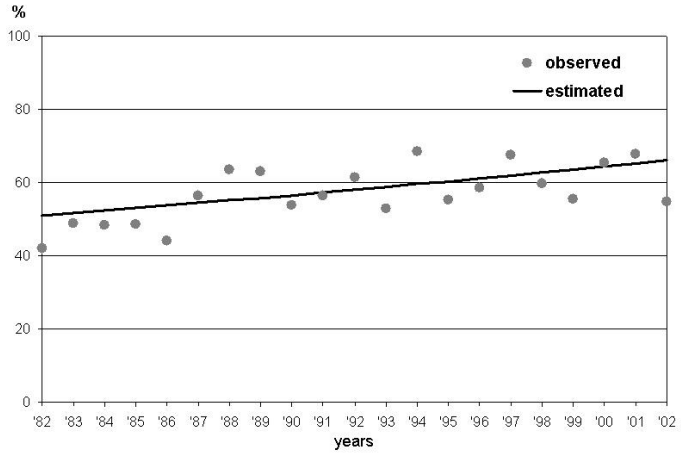

Figure 1. Joinpoint analysis for all patients. Trend for survival at 5 year follow-up.

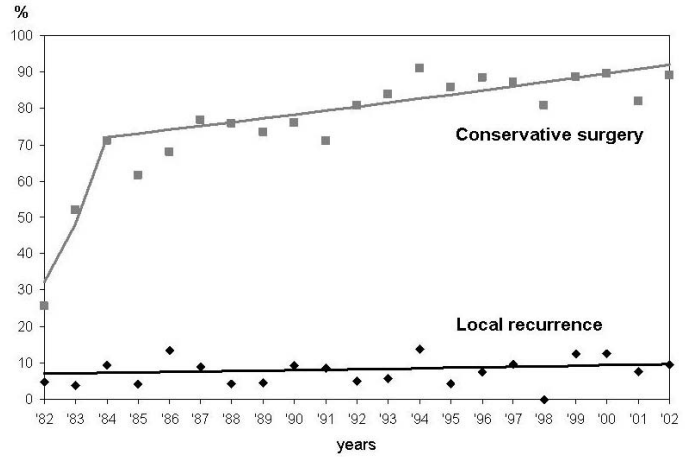

Figure 2. Joinpoint analysis of trend for conservative surgery and percentage of local recurrences.

L7 SSG`s experiences in Osteosarcoma and Ewing sarcoma

S. Smeland

Norwegian Radium Hospital, Oslo, Norway

Since 1979 SSG has conducted 8 bone sarcoma trials and currently participates in 3 ongoing trials. For osteosarcoma (SSG II) and Ewing sarcoma (SSG IV) the first SSG trial represented the introduction of modern chemotherapy in combination with aggressive surgery and both trials implied a breakthrough in outcome for the patients. The last analyzed trials, for patients with no metastasis at presentation, 5-year sarcoma-related survival for osteosarcoma (SSG XIV) and Ewing sarcoma (ISSG/SSG III) are 77% and 87% respectively. In addition, with the advances in surgical techniques more than 80% of the patients with extremity tumors can safely be operated upon with limbsaving surgery.

Through the decades there has been a development to more international collaboration with other study groups such as the Italian Sarcoma Group, the German-Swiss-Austrian-Hungarian COSS and with the ongoing randomized EURAMOS-1 study for osteosarcoma also the European Osteosarcoma Intergroup and the American Children Oncology Group. With EURAMOS-1 an annual recruitment of more than 350 patients is achieved compared to approximately 20 patients in single SSG studies.

In the SSG registry, from April 1986 to August 2008, 708 patients with osteosarcoma are registered. 408 (58%) are included in studies. During the period, relatively more patients are included in clinical trials with 37 % in the first part of the period (1986-89) to 68% in the last part (2000-08). Comparing the same parts of the period, the 5-year overall survival has increased from 41 to 48% and split into classical and non-classical osteosarcoma from 57% to 74% and from 19% to 21% respectively.

No new drugs in bone sarcomas have been introduced in first-line treatment for the last 20 years. Future improvement probably depends on development of new drugs based on basic knowledge of tumor biology.

In conclusion, the outcomes in osteosarcoma and Ewing sarcoma improved substantially with the introduction of modern therapy principles but seem to have reached a plateau. Of concern, the outcome for patients with non-classical osteosarcoma is still poor. Broad international collaboration is important to facilitate randomized trials and the need for more biological insight requires more comprehensive protocols with a focused translational research element.

L8 Characteristics of patients in a US post marketing osteosarcoma surveillance study

A. Gilsenan[1], K. Midkiff[1], R.D. Martin[1],Y. Wu[1], D.N. Masica[2], E.B. Andrews[1]

[1]RTI Health Solutions, RTP, NC, USA and [2]Eli Lilly & Co., Indianapolis, IN, USA

Introduction: Conducting an ongoing multiyear population-based surveillance study affords the opportunity to characterize the demographic, environmental, and treatment exposures in osteosarcoma patients aged 40 years and older.

Methods: Incident adult cases of primary osteosarcoma are identified through cancer registries in the US. Demographics and risk factor information are ascertained by telephone interview.

Results: As of December 2008, 890 cases of osteosarcoma diagnosed between January 1, 2003, and December 2007 were identified and 323 cases were interviewed. Characteristics were similar in interviewed cases and cases not interviewed. Among all cases identified, mean age was 62 years, 51 % were male, and 79% were white. Osteosarcoma NOS (68%) and chondroblastic osteosarcoma (12%) were the most common morphologic types; leg bones (18%) were the most common anatomical tumor site. Among those interviewed, reported prevalence of possible risk factors was 20% for history of radiation treatment, 20% for prior trauma or infection at site of cancer, and 6% for history of Paget's disease.

Conclusion: Data from this ongoing surveillance study add to the knowledge about adult patients with osteosarcoma and support information from the literature describing the distribution of possible risk factors.

L9 Histology of the physis following an extensible endoprosthesis in children with a malignant primary bone tumour around the knee

W.P. Cool, G. Blun, D.C. Mangham, R.J. Grimer, S.R. Carter, P.S. Walker

The Oncology Service, The Royal Orthopaedic Hospital, Birmingham, United Kingdom, Dept of Biomedical Engineering, The Royal National Orthopaedic Hospital, Stanmore, United Kingdom

Our centre has performed extensible endoprosthetic replacements for children with malignant primary bone tumours since 1976. The prostheses consist of a massive replacement of bone that can be lengthened, a constrained knee joint and a sliding component. The sliding component is situated at the opposite site of the joint that has been replaced and is so designed to allow passive growth to continue. The sliding component consists of an intramedullary stem that crosses the physis perpendicularly and is stabilised in the medullary cavity by means of a polyethylene sleeve. The purpose of this study was to retrospectively analyse the histological changes at the site of the sliding component.

Since 1976 our centre performed 118 extensible endoprosthetic replacements in 117 skeletally immature children who had a malignant primary bone tumour around the knee joint. 43 of the patients died and 11 patients had an amputation. There were 6 patients who had an amputation and later died. Since there was one patient who had bilateral extensible endoprosthetic replacements, there were 49 potential specimen for histological analysis. Only 5 specimen were available for analysis. Two of these specimen were fresh. The histological features were: 1: The polyethylene sleeve was surrounded by a soft tissue membrane and a shell of bone. 2: The soft tissue membrane was continuous with the soft tissue membrane immediately underneath the plateau of the constrained knee joint. The fibres in the soft membrane were orientated parallel to the long axis of the polyethylene sleeve. 3: The physis was pushed alongside the sliding component. The morphology of the physis and the formation of bony trabeculae was normal where the physis was in its normal horizontal orientation. In places where the physis was pushed vertically, they hypertrophic zone disappeared and no bony trabeculae were formed.

The results of this study seem to indicate that the forces acting on the physis and its surrounding bone are of importance in the development and growth of that bone.

L10 Resection of the spine for primary tumors. Principles and technique

B. Gunterberg, P. Bergh, Ö. Berlin

Dept of Orthopaedics, Sahlgrenska University Hospital, Gothenburg, Sweden

Background: The first report on total spondylectomy ever, for at primary malignant tumor of the spine, was published by Stener in the Journal of Bone and Joint Surgery 1971. Since then numeros reports on surgery for spinal tumors have been published. Staging and classification systems have been developed but are not widely used. The importance of a free surgical margin is not always recognized. The standardized spondylectomy procedure introduced by Tomita implies bilateral thread saw pediculotomy, which means intralesional surgery in most cases and thus an increased risk of local recurrence.

Principle: Individualized approaches that take into account the exact extent of tumor growth as shown by MRI or CT is adamant. A prerequisite for successful extralesional surgery is that at least one third or more of the circumference of the spinal canal is free of tumor making it possible to approach the dura through uninvolved tissue, which will then allow the specimen to be rotated out of the body without injury to the dural sac. If there is not enough tumor-free space to allow a wide enough safe approach to the dura the procedure must be considered palliative unless the contents of the spinal canal at tumor level are sacrificed. The main indications for this type of surgery are low-grade sarcomas and aggressive benign tumors, although high-grade lesions that do not respond to other treatments must be included.

Illustrative cases: 6 cases with adequate follow-up located in the cervical, thoracic, and lumbar spine will be demonstrated. Different individualized approaches, including lateral resection, multilevel sagittal resection and total spondylectomy will be presented.

Conclusion: Standardized, routine procedures for removal of primary tumors of the spine will seldom satisfy the need for an adequate margin. To stay outside the tumor will, in the spine as in the extremities, most certainly provide a higher rate of local control.

L11 EURAMOS-1: A randomized European/American osteosarcoma study

S. Smeland[1], O. Steen Nielsen[2], M. Eriksson[3], M. Tarkannen[4], T. Böhling[5], L. Hjorth[3]

[1]Norwegian Radium Hospital, Oslo, Norway, [2]Aarhus University Hosptial, Aarhus, Denmark, [3]Lund University Hospital, Lund, Sweden, [4]Helsinki University Central Hospital, Helsinki, Finland, [5]University of Helsinki and HUSLAB, Helsinki Hospital, Finland

Introduction: Based on an understanding that broad international collaboration facilitating randomized trials are important for further progress in osteosarcoma 4 multinational study groups (COG, COSS, EOI, SSG) agreed to collaborate in the European and American osteosarcoma study group, EURAMOS. Following a number of regulatory and organizational hurdles the EURAMOS-1 study was opened for accrual in April 2005.

Patients and methods: Major eligibility criteria are resectable osteosarcoma and age $\leq$40 years. The primary aim of the study is to determine whether altering postoperative therapy based on histological response benefit patients or not. Good responders (<10% viable cells) are randomized to maintenance treatment or not with pegylated interferon-alfa and poor histological responders to addition or not of an ifosfamide/ etoposide combination.

Results: As of February 2009 1306 patients have been enrolled (658 COG, 309 COSS, 274 EOI, 65 SSG) and 729 patients are randomized. 90 % of the SSG patients are included in a Quality-of-life sub-study. No toxic death is reported among SSG patients. For the whole study 53 % and for the SSG cohort 46 % of the patients are good histological responders. Due to a lower randomization rate than expected the accrual time is extended by 1 year to June 2010.

Conclusion: The inclusion rate is on target and EURAMOS is already the fastest recruiting and biggest osteosarcoma trial ever and demonstrates the strength of broad international collaboration. In addition to address important questions in a randomized setting, by EURAMOS-1 a common language in osteosarcoma has been established.

L12 Prognostic systems for soft tissue sarcoma of the extremities and trunk wall in adults

J. Engellau

Dept of Oncology, Lund University Hospital, Lund, Sweden

In non-visceral soft tissue sarcomas in adults, about one-third of the patients with localized tumors at diagnosis will develop metastasis. Meta-analyses of the efficacy of adjuvant chemotherapy have demonstrated a marginal benefit in reducing the occurrence of metastasis and increasing overall survival. Despite this the use of chemotherapy, often with severe side-effects, in the adjuvant setting has become more common. In order to identify patients at risk for metastasis, for who the treatment-induced toxicity may be warranted, there has been a strong interest in developing clinically applicable prognostic systems for STS patients. In the current work prognostication is critically reviewed with particular reference to malignancy grading and commonly used prognostic systems. These include the Nomogram developed at the Memorial Sloane Kettering Cancer Center, the American AJCC/UICC system and the systems developed by the Scandinavian Sarcoma Group. An overview of the most commonly used prognostic factors in the abovementioned systems is presented as well as the Scandinavian experience using the population-based SSG Registry in developing clinically useful prognostic systems.

L13 Clinical and molecular studies of liposarcoma

K. Engström

Dept of Oncology, Sahlgrenska Academy, Göteborg University, Sweden

Purpose of thesis: 1) To analyze the local recurrence-free and metastasis-free survival and to determine how the Scandinavian Sarcoma Group (SSG) treatment guidelines were followed in liposarcoma (LS) in extremities and trunk wall. 2) To study the tumor volume response and morphology after radiotherapy in myxoid/round cell liposarcoma (MLS/RCLS). 3) To examine the role of the MLS-specific fusion gene *FUS-DDIT3* in development of liposarcoma

Patients and methods: 1) 237 reviewed patients, diagnosed between 1986 and 1998 in Norway and Sweden and reported to the Scandinavian Sarcoma Group Register, were analyzed for local recurrences in relation to surgical margins and radiotherapy, metastasis and survival. 2) 33 primary and metastatic MLS and MLS/RCLS were treated with radiotherapy. Tumor size was measured by CT or MRI before and after irradiation. Histopathology was performed of both irradiated and non-irradiated lesions. 3) The fibrosarcoma cell line HT1080 was transfected with the recombinant vectors p*FUS-DDIT3*-EGFP, p*DDIT3*-EGFP and p*FUSa*-EGFP. The transfectants and the HT1080 cell line were injected into severe combined immunodeficient (SCID) mice. The transfected and non-transfected cells were cultured with adipogenic induction medium and microarray-based expression comparison of the different cell line was performed.

Results: 1) The well differentiated LS of extremity and trunk wall did not develop metastasies and in spite of non-wide surgery and no radiotherapy only 18% developed local recurrence. High-grade LS with non-wide surgery was treated with postoperative radiotherapy in only 58%. The local recurrence rate was 19% with and 47% without radiotherapy. The metatstatic rate in the high-grade group varied between 33% and 57%. Only 2 patients had adjuvant chemotherapy. The estimated 10-year metastasis-free survival rate was 95% for low-grade LS and 61% for high-grade LS. Local recurrence-free survival rates were 87% for low-grade LS and 75% for high-grade LS.

2) 17 MLS/RCLS tumors responded with more than 30% tumor volume reduction after radiation doses between 40–46 Gy. The morphologic changes were hyalinization, paucicellularity and lipoma-like appearance.

3) Cells expressing *FUS-DDIT3* and *DDIT3* grew in SCID mice as liposarcomas and the capillary network was similar to that found in MLSs/RCLSs. Cells transfected with *DDIT3* responded in vitro to adipogenic factors by accumulation of fat, and microarray-based comparison showed that the *DDIT3* and *FUS-DDIT3*-transfected variants shifted toward an MLS/RCLS-like expression pattern.

Interpretation: 1) The study supports the use of the term “atypical lipomatous tumor” instead of ¨well differentiated LS¨ for lesions arising in the extremities and trunk wall. There was a poor compliance with the SSG treatment guidelines for radiotherapy of high-grade LS. 2) MLS and MLS/RCLS have high radio-responsiveness and radiotherapy is indicated after non-wide surgery or in a preoperative setting. 3) The fusion oncogene *FUS-DDIT3* and *DDIT3* may induce a liposarcoma phenotype, with *DDIT3* being the tumor type-determining part of this fusion oncogene.

L14 Soft tissue leiomyosarcoma – A summary of the SSG project

C. Svarvar[1], C. Blomqvist[2], T. Böhling[3] and the SSG Leiomyosarcoma Working Group

Depts of [1]Plastic Surgery, [2]Oncology, [3]HUSLAB, University Hospital, Helsinki, Finland

Introduction: Leiomyosarcoma (LMS) is among the most common sarcomas, but has rarely been studied as a single entity in any larger series. We studied clinicopathologic and cytogenetic characteristics, and prognostic factors of LMS.

Patients and methods: The SSG Pathology Board reviewed the non-visceral soft tissue LMS in the extremities, trunk wall or superficial parts of the head and neck region registered 1986–2001 in the SSG Register. The clinical course and prognostic factors were analyzed. Grading and staging systems were tested for their strength identifying high-risk tumors. Furthermore, DNA copy number changes were investigated by CGH.

Results: Multivariate analysis showed that higher grade, larger size, and deep location correlated significantly with decreased metastasis-free survival. At 10 years, 84% with localized disease at presentation were free from local recurrence, 66% remained metastasis free, and 49% were alive. We found some typical and nearly consistent DNA copy number changes: losses in 10q, 13q, and 16q, gains in 1q, and gains and high-level amplifications in 17p.

Conclusion: Subcutaneous and deep-seated LMS possess a high metastatic risk in contrast to the cutaneous. Combining malignancy grade and tumor size gives the best tool for prognostication of non-visceral soft tissue LMS.

L15 Radiotherapy in soft tissue sarcoma. An SSG thesis project

N. Jebsen[1], C. Trovik[1], J. Engellau[2], K. Sundby Hall[3], Ø. Bruland[3,4]

[1]Haukeland University Hospital, Bergen Norway, [2]University Hospital Lund, Lund, Sweden, [3]Norwegian Radium Hospital, Oslo, Norway, [4]University of Oslo, Oslo, Norway

We have analysed data from the SSG Register on patients with an extremity or trunk wall STS diagnosed 1986–2005. Parallel to an increased use of radiotherapy (RT) in Scandinavia over the last two decades, we found a significant improvement in 5-year local recurrence rates (LR) from 27% to 15%. The positive impact of RT was irrespective of malignancy grade, depth and surgical margins (1).

From 1998–2007, adjuvant chemotherapy and hyperfractionated accelerated RT was administered to patients with high risk STS (Protocol SSG XIII). Analyses of survival, pattern of local relapse and side effects of RT among 120 eligible patients are ongoing.

The optimal RT dose and treatment volume in postoperative RT in soft tissue sarcoma is not known. From the SSG Register, all patients with a localized soft tissue sarcoma in extremities or trunk wall treated with primary resection and adjuvant radiotherapy are identified. The aim is to study the relationship between RT dose and LR, and to determine the anatomical location of a LR in relation to the irradiated volume.

The last part of this thesis project comprises a study of late effects of RT and the impact on extremity function in STS patients treated with surgery or surgery and RT. Late effects of RT will be registered by clinical examination at a follow up visit after treatment, and physical function will be recorded by a validated questionnaire.

(1). Jebsen NL, Trovik CS, Bauer HC, Rydholm A, Monge OR, Hall KS, Alvegård T, Bruland OS. (2008 Jul 15) Radiotherapy to improve local control regardless of surgical margin and malignancy grade in extremity and trunk wall soft tissue sarcoma: A Scandinavian sarcoma group study. Int J Radiat Oncol Biol Phys 71(4):1196-203.

L16 Chest wall chondrosarcoma

B. Widhe, H.C.F. Bauer

Division of Orthopedics, Dept of Molecular Medicine and Surgery, Karolinska Institute, Karolinska Hospital, Stockholm, Sweden

Background: Chondrosarcoma of the chest wall is the most frequent primary malignant chest wall tumor. Surgery remains the only effective treatment. Bone sarcomas in Sweden are generally referred to a multidisciplinary team at specialized sarcoma centers. This practice is strictly followed for sarcomas of long bones. For sarcomas located in the chest wall, however, many patients are treated outside a sarcoma center.

Patients and methods: The patient material included all 106 consecutive chondrosarcomas of the chest wall diagnosed in Sweden 1980–2002, with a median follow-up of 9 (4–23) years for survivors. Clinical files were gathered and pathological specimens re-evaluated and graded by the Scandinavian sarcoma pathology group. Surgical margins were defined as wide, marginal, and intralesional.

Results: The most prominent initial symptom was a palpable mass noted by 69 % (70/106) at the first visit. Pain was uncommon and reported only by one third of the patients.

Patients operated with wide surgical margins had a 10-year survival rate of 92 %, compared to 47 % for those with intralesional resections. Patients treated at a sarcoma center had less intralesional procedures and resulted in higher 10-year survival rates, 75 % compared to 59 for those treated at non-specialty center. Prognostic factors for local recurrence were surgical margin and histological grade; for metastases, histological grade, local recurrence, tumor size.

Conclusion: Presenting symptom was most often a painless palpable mass. Patients operated with wide surgical margins resulted in fewer local recurrence and better overall survival. Patients with chest wall tumors should be referred to sarcoma centers for diagnosis and treatment it would increase outcome.

L17 New techniques in radiotherapy of sarcomas

R. Schwarz

Dept of Radiation Oncology, Medical Center Hamburg-Eppendorf, Germany

Introduction: Radiation therapy plays a central role in the treatment of sarcomas. In axial tumor sites the use of conventional radiotherapy with adequate tumor dose is limited by radiosensitive organs. The possible role of new techniques like IMRT and particle beam therapy is analysed and discussed.

Material and methods: 3D-conformal photontherapy is the standard treatment for extremity tumors. Sarcoma in central sites remain a complex problem. Intensity modulated Radiotherapy (IMRT) including tomotherapy are available at many centers. Protons and particle beam therapy are expensive treatment modalities which might improve the outcome.

Results: IMRT improves dose distribution by high conformality. Protontherapy can confine the high-dose treatment area to the tumor volume and can minimize dose to surrounding normal tissue. Heavy ions combine the depth-dose localisation properties of protons with high radiobiological advantage. There is a high physical and radiobiological potential for the treatment of sarcomas.

Conclusion: New techniques like IMRT are of beneficial for the treatment of sarcomas in axial sites. Proton therapy may bring further advantages in terms of better dose distributions. Heavy ion therapy has a high physical and radiobiological potential for radiotherapy of sarcomas.

L18 The role of chemotherapy in soft tissue sarcomas

S.R. Patel

Dept of Sarcoma Medical Oncology, The University of Texas M.D. Anderson Cancer Center, Houston, USA

Soft tissue sarcomas represent a wide range of rare heterogeneous clinical entities with variable biologic behaviors. Historically, these have been "lumped" together as one entity to facilitate large enough clinical trials to be able to answer therapeutic questions. The recognition of GIST as a distinct clinical entity, separate from the smooth muscle tumors it used to be lumped with, has resulted in a paradigm shift. Worldwide, the sarcoma community now acknowledges the clinical and molecular heterogeneity of sarcomas and has been collaborating actively to advance therapies in subset or histology-specific clinical trials. AJCC stage 1 and 2 tumors have a limited potential for distant metastases and consequently, are effectively managed with margin-negative surgical resection with or without adjuvant radiation therapy. AJCC stage 3 patients have approximately 50% long-term survival with adequate local therapy alone, and are therefore candidates for multimodality approach including systemic therapy. Patients with AJCC stage 4 diseases continue to be a challenge for the medical oncologists with approximately 20–25% long-term survival with multimodality therapy. The backbone of systemic therapy for most soft tissue sarcomas remains an anthracycline with or without ifosfamide. Dose-intensive combination of both agents results in higher response rates and possibly favorable PFS in patients with stage 4 disease, however, OS improvements have not been documented in suboptimal randomized clinical trials. In contrast, as expected, in appropriately selected stage 3 patients, adjuvant therapy with the dose-intensive combination of anthracycline and ifosfamide does improve survival as shown by the Italian Sarcoma Group. This is also supported by the marginal, but statistically significant improvement in OS in the updated meta-analysis published by Pervaiz et al in Cancer 2008. Based on a randomized phase 2 trial conducted by SARC, the usual second-line therapy for the US patient population seems to be the combination of gemcitabine and taxotere with some selective activity in leiomyosarcomas of gynecologic origin. Trabectedin is approved in Europe for second-line therapy but remains investigational in the US. Several of the molecularly targeted agents have been investigated in a range of soft tissue sarcomas with some success in select subtypes e.g. Imatinib in DFSP. While we anxiously await the identification of more molecularly targeted agents to improve the therapeutic ratio for patients with these difficult diseases, it is of importance that we utilize the currently available therapeutic armamentarium to the best of our ability.

L19 SSG experiences in soft tissue sarcomas (STS)

K. Sundby Hall[1], N. Jebsen[2], M. Eriksson[3], Ø. Bruland[1,4], J. Engellau[3], C. Trovik[2]

[1]Norwegian Radium Hospital, Oslo, Norway, [2]Haukeland University Hospital, Bergen Norway, [3]University Hospital Lund, Lund, Sweden, [4]University of Oslo, Oslo, Norway

The use of adjuvant radiotherapy and chemotherapy has steadily increased since SSG was established in 1979. With the increasing use of postoperative radiotherapy, 5-year local recurrence rate has decreased from 27% to 15% without any obvious change in the rate of wide surgical margins. Due to the previous high risk of local relapse following a wide surgical margin in deep STS, radiotherapy is currently routine practice for these patients.

The first adjuvant chemotherapy study by SSG was a randomized study, carried out 1981–86 (SSG I). No effect on metastases-free or overall survival was demonstrated. In the second adjuvant study 1998–2007 (SSG XIII; n=114), 6 cycles of doxorubicin 50 mg/m^2 + ifosfamide 5g/m^2 were given. Depending on margins 36 Gy or 45 Gy (1,8 Gy given twice daily), were given interpolated between chemotherapy. All patients had at least 2 of the prognostic factors: Tumor size >8 cm, necrosis, and vascular invasion. The preliminary survival data is promising, and toxicity seems moderate. An update will be presented.

In 2007 a new adjuvant protocol, SSG XX was initiated, based on SSG XIII and improved knowledge on prognostic factors. In SSG XX all patients have either vascular invasion or the presence of at least 2 of the risk factors: size $\geq$8 cm, necrosis, or infiltrative growth. 6 cycles of doxorubicin 60 mg/m^2 and ifosfamide 6 g/m^2 are given with interpolation of hyperfractionated/accelerated radiotherapy. More than 30 patients have been included.

SSG has also published recommendations for the treatment of metastatic STS 2004, SSG XIX.

L20 The prognosis of radiation-induced sarcoma compared to sporadic sarcoma

B. Bjerkehagen[1], S. Smeland[2], S. Skjeldal[3], K. Sundby Hall[2], J.M. Nesland[1,4], M.C. Småstuen[2], S. D. Fossså[2,4]

[1]Division of Pathology, [2]Division of Cancer Medicine and Radiotherapy, [3]Division of Surgery, Norwegian Radium Hospital, Oslo University Hospital, [4]University of Oslo, Medical Faculty, Division of Radium Hospital, Oslo, Norway

Introduction: Radiation-induced sarcoma (RIS) is a rare but serious complication after radiotherapy (1). The aim of this study was to compare the survival of RIS patients with a control group of sporadic sarcoma patients.

Materials and methods: 108 patients with RIS were identified from the institutional sarcoma data base and 234 controls were drawn at random from the same source. The controls were matched by the most abundant histological subgroups among RIS: malignant fibrous histiocytoma (MFH), osteosarcoma, leiomyosarcoma, angiosarcoma, and malignant peripheral nerve sheath tumor. Medical records and histological material from both primary cancer and RIS were reviewed.

Results: RIS represented 3.0 % of the sarcomas in the data base (77 female and 31 male). The median latency time from radiotherapy of the primary tumour to the diagnosis of RIS was 4 (2.3–61) years. Gynecological, breast, and testicular cancers were the most common primary diagnoses. For the RISs, there were 13 different histological types identified including 30 MFH (28% of all) and 26 osteosarcomas (24%). Crude Kaplan-Meier analysis revealed a significant difference in survival between RIS and sporadic sarcoma. Multivariate analysis will be performed to investigate whether this difference is due to an adverse effect of a sarcoma being radiation-induced per se.

Conclusion: Preliminary analyses revealed significant differences in survival between radiation-induced sarcoma and sporadic sarcoma.

References

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L21 Imaging of glucose metabolism and perfusion in musculoskeletal tumours by positron emission tomography (PET)

P. Lindholm, E. Sutinen, V. Oikonen, M. Tarkkanen, T. Böhling, M. Kallajoki, K. Mattila, H. Aro, A. Kivioja, H. Minn, I. Elomaa

University Hospitals of Turku and Helsinki, Turku PET Centre, Finland

Introduction: We studied glucose metabolism and blood flow (BF) in untreated localized musculoskeletal tumors of the extremities using FDG, oxygen-15 labeled water (^{15}O-water) and PET.

Patients and methods: 6 patients with high grade osteosarcoma (OS), 2 with soft-tissue sarcoma (STS) and 1 with aneurysmal bone cyst had PET studies with ^{15}O-water and FDG. Arterial blood sampling and autoradiography calculation method were used to define BF as mL/(100g x min). Tumor FDG uptake was measured as standardized uptake values (SUVs) and regional metabolic rates for FDG (rMR_{FDG}). 2 patients also had FDG PET studies during (1 pts) and after (2 pts) preoperative chemotherapy. All patients underwent dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI). Dynamic enhancement was analyzed using the region of interest method and time-intensity curves were drawn. The PET findings were compared with the clinical data and results of DCE-MRI.

Results: BF in bone tumours was 32–75 mL/100g/min and in STS 9.0–46 mL/100g/min. FDG uptake and rMR_{FDG} in untreated bone tumours were 5.4–18 and 12–57 μmol/100g/min, respectively. FDG uptake and rMR_{FDG} in STS were 2.6–12 and 5.6–32 μmol/100g/min, respectively. 4/5 sarcomas with SUV >9.0 have already relapsed. OS with a low SUV and the highest BF had a complete response to chemotherapy, while OS with the lowest BF progressed during the therapy.

Conclusion: Measurement of BF in musculoskeletal tumors appears to be feasible by PET and ^{15}O-water. The influence of tumor BF and glucose metabolism on the final outcome in sarcoma varies and needs further research.

L22 New prognostic markers for malignant peripheral nerve sheath tumors

M. Kolberg[1,7], H.R. Brekke[1,7], F.R. Ribeiro[1,2], T.H. Ågesen[1,7], K. Sundby Hall[3], B. Bjerkehagen[4], N. Mandahl[5], H.A. Domanski[5], E. van den Berg[6], S. Smeland[3], R.I. Skotheim[1,7], F. Mertens[5], R.A. Lothe[1,7]

[1]Dept of Cancer Prevention, Institute for Cancer Research, Norwegian Radium Hospital, Oslo University Hospital, Montebello, Oslo, Norway, [2]Dept of Genetics, Portuguese Oncology Institute, Porto, Portugal, [3]Division of Cancer Medicine and Radiotherapy, Dept of Oncology, and [4]Dept of Pathology, Norwegian Radium Hospital, Oslo University Hospital, Montebello, Oslo, Norway. [5]Dept of Clinical Genetics, Lund University Hospital, Lund, Sweden, [6]Dept of Medical Genetics, University Hospital of Groningen, the Netherlands, [7]Centre for Cancer Biomedicine, University of Oslo, Oslo, Norway

Malignant peripheral nerve sheath tumor (MPNST) is a highly aggressive malignancy for which no consensus therapy exists besides surgery. There is a need for prognostic markers that could identify patients who need of adjuvant therapy.

We have assessed *in situ* protein expression using tissue microarrays (TMA) of 64 paraffin embedded MPNSTs and genomic aberrations by comparative genomic hybridization (CGH) of 48 fresh frozen tumors. Both series include sporadic cases as well as patients with the hereditary genetic disease Neurofibromatosis type 1 (NF1), who have a known increased risk for development of MPNST.

From the TMA study increased p53 expression was identified as an independent marker for poor survival (p= 0.01, n=59), also among patients in complete remission (p=0.04, n=40). From the CGH analyses (n=48) we identified that genomic loss from chromosome arms 10q (p<0.001) and Xq (p=0.006) were strongly associated with poor prognosis. For 26 tumors data were available from both the TMA and CGH studies, and we found that high p53 expression and loss of 10q were independent prognostic markers. Strikingly, the 18 patients who displayed at least one of these traits had a median survival of 19 months whereas only 1 disease specific death (after 81 months) was observed for the remaining 8 patients in a 10-year-period.

L23 SSG XVII version 2: Recommendations for the diagnosis and treatment of intraabdominal, retroperitoneal, and uterine sarcoma

J. Åhlen, M. Eriksson, K. Sundby Hall, O. Monge, H. Joensuu, Ø. Bruland, B. Nordström, G. Kristensen, B. Larsson, K. Sivers, E. Brun, B. Bjerkehagen, V. Abeler, H. K. Haugland, F. Mertens, S. Stoldt, B. Nilsson, A. Bergenfelz, T. Alvegård

The Scandinavian Sarcoma Group, University Hospital, Lund, Sweden

Soft tissue sarcoma (STS) arising in the retroperitoneum or in the abdominal cavity traditionally carries a poor prognosis. However, the introduction of tyrosine kinase inhibitors (TKI) has dramatically changed the course of gastrointestinal stromal tumors (GIST) and the duration of response to TKIs is not yet known.

The management of abdominal, retroperitoneal and uterine STS is complex and therefore, with the goal to improve the course of this group of patients, should they always be referred to a specialized centre and treated by a multidisciplinary group with interest and experience in sarcoma.

They constitute about 20–25% of all soft tissue sarcomas where the GIST incidence is about $1{,}5/10^5$ and uterine sarcomas $1{,}2–1{,}7/10^5$ in the female population.

Patients commonly present with a large, non-tender abdominal mass, sometimes symptoms of non-specific abdominal discomfort or pain. However, STS in the gastrointestinal tract often present with bleeding, abdominal pain or obstruction.

There is a broad spectrum of histological entities, where liposarcoma is most common in the retroperitoneum, GIST intraabdominally and leiomyosarcoma most common in uterine sarcoma. Fine needle aspiration biopsy is recommended as a first choice for preoperative diagnosis and a core-needle biopsy could be used if additional information is needed, e.g. for mutation analysis. In uterine sarcoma curettage is indicated as first choice.

In addition to morphological diagnosis including immunohistochemistry and mutation analyses, tumor size, necrosis, mitotic activity, vascular invasion, peripheral tumor growth and surgical margins should also be evaluated.

CT is preferred as a general screening tool for basic preoperative evaluation and to exclude metastases and local spread whereas MRI is the method of choice for secondary evaluation. Additional methods to be used in the evaluation of STS is FDG-PET, ultrasound, both contrast-enhanced, endoscopic and vaginal ultrasound, including the possibility of biopsy.

Before treatment, all patients should be discussed in a multidisciplinary team. Surgery is today the mainstay treatment which still also applies to GISTs. The surgical goal is complete resection with adequate tissue margins and organs adjoining the tumor need to be considered for en bloc resection.

Adjuvant radiation or chemotherapy is not recommended except in GIST where there is some evidence for adjuvant treatment and it may therefore be recommended that patients with high risk tumors should be treated if possible.

Locoregional recurrence is more common than metastasis and commonly the cause of death whereas in uterine sarcoma distant metastasis is more prevalent. All patients with recurrent disease should be evaluated and discussed for combination therapy of surgery, radiotherapy, chemotherapy, hormone therapy or other antitumor agents. In recurrence, unresectable or metastatic disease chemotherapy should always be considered, see SSG XIX. In GIST is imatinib currently considered first-line systemic therapy whereas Sunitinib is the second-line therapy.

It is, as a general rule, recommended that all patients should be followed every 6 months up to 5 years and every 12 months for the next 5 years.

L24 GIST; from palliative to adjuvant treatment

H. Joensuu

Dept of Oncology, University of Helsinki, Helsinki, Finland

Prior to the year 2000, patients diagnosed with advanced gastrointestinal stromal tumour (GIST) had a median survival time of only 1 to 2 years. Imatinib mesylate was the first effective systemic treatment for advanced GIST, and now a few other tyrosine kinase inhibitors, including sunitinib, nilotinib, sorafenib and vatalanib have also found to be active. The majority (up to 85%) of GIST patients achieve a durable response or a long-lasting disease stabilization with imatinib therapy, and the median survival time of patients diagnosed with advanced GIST has now extended to approximately 5 years as calculated from the date of treatment initiation. Most patients with advanced GIST will ultimately succumb to the disease. Acquired secondary mutations that interfere with imatinib binding are a common mechanism for drug resistance and tumour progression in advanced GIST. One of the factors related to appearance of second mutations is likely the tumour mass. Early administration of imatinib in the adjuvant setting, when the tumour mass is still small, might result in a low rate of emerging secondary mutations, and may have a potential to improve survival. The results of the ACOSOG Z9001 trial demonstrated a significantly longer recurrence-free survival among patients treated with adjuvant imatinib as compared to those assigned to placebo. Although it is currently not known whether adjuvant imatinib will improve overall survival, administration of imatinib may be warranted to patients who have a high risk of recurrence and death from GIST that likely exceeds the risks related to adjuvant administration of imatinib. Important aspects of adjuvant imatinib treatment remain inadequately addressed. These include the late effects of treatment, optimal selection criteria of patients for treatment, and the duration of adjuvant treatment, which is currently being investigated in the ongoing Scandinavian Sarcoma Group/AIO trial (SSG/AIO XVIII) that completed accrual in 2008.

L25 Large intestinal GIST with high-risk criteria in a neonate treated with surgery only

Å. Jakobson[1], T. Granholm[2], A. Orrego[3]

[1]Paediatric cancer unit, [2]Paediatric surgery, Astrid Lindgren Children's Hospital, [3]Dept of Pathology, Karolinska University Hospital, Stockholm, Sweden

Introduction: Gastrointestinal stromal tumor (GIST) is rare, particularly in childhood. 3 paediatric cases, including the present one, have been recorded in our hospital since 1990 and we have found only 3 neonatal cases reported in the literature.

Patient: A nearly 4-week-old girl was admitted for abdominal distension and vomiting. An abdominal plain radiograph, ultrasound, CT, and MRI scan showed a large, partially cystic solid tumor thought to originate from one of the ovaries. At surgery the tumor was found to originate from the small bowel, about 60 cm distal to the ligament of Treitz. It was completely removed, including 2 cm of normal intestine on either side. The tumor measured 9x8x4.5 cm and weighed 190 grams. No further treatment was given and the child has been followed up for 3 years without any signs of relapse.

Pathology: The serosal surfaces as well as the intestinal mucosa were intact and the resection margins were free from tumor tissue. A few cystic cavities were found. Microscopy showed densely packed oval to elongated cells with slight atypia in a myxoid stroma. 18 mitoses/50 HPF were counted. A large number of thin-walled vessels could be seen but no intravascular tumor growth or necrosis. The tumor cells stained positive for vimentin, desmin and CD117, but negative for CD34, Myf-4, NSE, S-100, NFP, NGFR5, CD68 and CD99. Staining for actin HHF 35 and smooth muscle actin showed no convincing positivity. Staining for Ki-67/MIB-1 indicated a proliferation rate of 10%. Molecular analysis failed to show any mutations in the *c-kit* gene (exons 9, 11, 13 and 17) or the PDGFRA gene (exons 12 and 18).

Conclusion: Our patient thus presented with a large tumor with histopathological and immunohistochemical findings consistent with GIST with poor prognostic factors according to the current classification for adults. All 3 patients previously reported, and ours, are alive with no treatment other than surgery despite the presence of poor prognostic factors in 2/4 patients. 1 out of 3 stained positive for CD117 (ND in 1) and 1/4 patients were positive for CD34. One might therefore speculate that GISTs in neonates represent a different nosologic entity, or that young age overrides other prognostic factors.

L26 The effects of hyperthermia on the concentration of soluble TNF-receptor 1 in isolated limb perfusion

L E. Podleska[1], F. Grabellus[2], S. Lendemans[1], D. Nast-Kolb[1], G. Taeger[1]

[1]Sarcoma Center at the West German Cancer Center, University of Duisburg-Essen, Essen, Germany
[2]Institute of Pathology and Neuropathology, University Hospital Essen, Germany

Introduction: Isolated limb perfusion (ILP) for the treatment of locally advanced soft tissue sarcoma is usually conducted under local hyperthermia of the limb. Recent literature suggests that hyperthermia is able to raise the concentration of the soluble TNF-receptor-1 (sTNFR1) in the organism. This could lead to an attenuation of the effects of the therapeutically applied TNF-alpha since sTNFR1 is able to bind circulating TNF-alpha. We studied this question in a cell culture model.

Materials and methods: To simulate hyperthermia on endothelium we treated HUVEC with 39°C hyperthermia for 2 hours. Incubation was continued afterwards at 37°C. At 0, 3, 6, 12, 24 and 48 hours after hyperthermia supernatants were taken to measure sTNFR1 by ELISA. Furthermore cells were lysed to measure membrane bound TNFR1 by Western-Blot. A set of cells that was not treated with hyperthermia served as a control. Furthermore we examined human mononuclear cells from the peripheral blood (PBMNC) in the same experimental setting as mentioned above (cells were isolated by Ficoll-gradient prior to incubation). In a third step we examined the effects of hyperthermia on human fibrosarcoma cells (HT-1080) in the setting described before.

Results: Already directly (0 hours) after hyperthermia measurable amounts of sTNFR1 could be found in the supernatants from all 3 cell lines. Also the concentration of sTNFR1 is increasing continuosly during the incubation phase in the following 48 hours. Most interestingly there was no difference during hyperthermia treated cells and the control groups. Also the Western Blot shows no difference in TNF-receptor-concentration on the cell surface.

Conclusion: Soluble TNF-receptor-1 cumulates in supernatants from all 3 cell lines during the incubation while hyperthermia is not able to induce a noticeable difference compared to cells incubated constantly at 37°C. The postulated TNF-antagonistic effects caused by hyperthermia could not be proved in our experiments.

L27 Delayed methotraxate elimination: may fruit drinks have a clinical impact?

K. Sundby Hall[1], J.P. Poulsen[1], L.H. Aksnes[1], E. Berland[1], C.M. Vaade[1], H. Olsen[2], A. Andersen[2]

[1]Dept of Oncology, [2]Dept of Clinical Pharmacology, The Norwegian Radium Hospital, Oslo, Norway

Case: A 12-year-old boy treated according to the Euramos I protocol for osteosarcoma received 8 courses of HD-MTX 12 g/m^2 without any complications. By the 9th cycle of HD-MTX, his plasma-MTX at 18 hours (T18) was 425 µmol/L (tox limit 100 µmol/L and at T24 it was 315 µmol/L (tox limit 20 µmol/L). Plasma-creatinine at T24 had increased to 127 µmol/L, and signs of liver toxicity were evident.

Treatment and results: Glucarpidase 50 U/kg was given at T32. 1 hour later plasma-MTX had decreased to 2.0 µmol/L measured by HPLC. High-dose IV Leucovorin was given until Day 6. At that time plasma-MTX was 0.65 µmol/L, and Leucovorin was given orally until Day 18 when plasma-MTX was 0.06 µmol/L. Plasma-creatinine declined slowly from 155 µmol/L at T72 to 79 µmol/L at Day 18. In addition to Glucarpidase and Leucovorin, vigorous hydration (6 L per 24 h) and alkalinization were given. The liver parameters were almost recovered at T72.

Conclusions: Glucarpidase effectively reduced serum-MTX exposure. Our patient had an excessive intake of fruit juices containing high-amounts of various acids before the 9th course of HD-MTX. Despite no demonstrable effect on urine pH in this patient, these drinks combined with HD-MTX may have a nephrotoxic potential.

L28 Targeting the P53/HDM2 interaction as a therapeutic strategy in synovial sarcoma

P. Darcy, W. Maruwge, B. Brodin

Dept of Oncology and Pathology, Cancer Center Karolinska, Stockholm, Sweden

Mutations of the p53 gene are uncommon in synovial sarcoma, a high-grade tumor genetically characterized by the chromosomal translocation t:(X;18),that results in the fusion of SS18 with SSX gene.

We recently reported that SS18-SSX1 negatively regulates the stability of p53 by promoting its ubiquitination and degradation in a manner dependent on the ubiquitin ligase activity of HDM2. The negative effect of SS18-SSX1 expression on p53 was mediated by its ability to promote HDM2 stabilization through inhibition of HDM2 autoubiquitination. The final outcome translates into a deficient transactivation of p53-regulated genes: HDM2, PUMA,and NOXA that are important to preserve genomic integrity in response to cellular stress.

Our data uncovers a novel mechanism whereby, in synovial sarcoma cells with wild

type p53, the SS18-SSX oncoprotein can negatively regulate p53 tumor-suppressive function by increasing the stability of its negative regulator HDM2.

We further hypothesise that chemical compounds that target the p53-HDM2 regulatory axis may rescue p53 function in synovial sarcoma. With this in mind we investigated the potential of the HDM2 antagonists, *nutlin-3* and of the recently discovered *tenovin 1*, to rescue p53 activity in synovial sarcoma cells lines. *Nutlin-3* effectively stabilized p53 half-life and trans-activating function, resulting in cell growth arrest and apoptosis.

We further observed that chemotherapeutic agents like doxorubicin also stabilized p53 in response to DNA damage but did not restore p53 transcriptional activity due to rapid complexing of p53 to HDM2. On the contrary, *nutlin-,3* stabilized p53 and inhibited p53-HDM2 interaction, thereby rescuing p53 tumor suppression function. Our results suggests that the inhibition of the p53-HDM2 interaction by small molecules is a highly potential therapeutic strategy for soft tissue sarcomas with wild type p53.

L29 Novel druggable targets identified in gene expression profiles of MPNSTs and neurofibromas

T.H. Ågesen[1,5], M. Kolberg[1,5], S. Aske Danielsen[1,5], H.R. Brekke[1,5], G.E. Lind[1,5], B. Bjerkehagen[2], K. Sundby Hall[3], N. Mandahl[4], S. Smeland[3], F. Mertens[4], R.I. Skotheim[1,5], R.A. Lothe[1,5]

[1]Dept of Cancer Prevention, Institute for Cancer Research, [2]Division of Pathology, and [3]Division of Cancer Medicine and Radiotherapy, Dept of Oncology, Norwegian Radium Hospital, Oslo University Hospital, Montebello, Oslo, Norway; [4]Dept of Clinical Genetics, Lund University Hospital, Lund, Sweden; [5]CoE – Centre for Cancer Biomedicine, University of Oslo, Norway

Malignant peripheral nerve sheath tumor (MPNST) is an aggressive malignancy that frequently metastasizes resulting in a poor prognosis for the patient. Surgery is the main treatment of these patients supplemented with chemotherapy and/or radiation but the benefit for the patients by this adjuvant treatment is uncertain. Thus, the identification of novel druggable gene targets in MPNST is highly warranted. We have analyzed the global gene expression from 33 MPNSTs and 7 neurofibromas (Applied Biosystems 1700 platform; 32 878 probes). The samples derive from 34 patients and include individuals both with and without a family history of NF1. By comparing gene expression between the benign neurofibromas and MPNSTs we found a number of genes significantly differentially expressed between the two groups. A substantial number of these genes were, as expected, associated with regulation of cell cycle and proliferation (*e.g. CDKN1A* (alias *p21*), *MKI67* (alias *KI67*), and *CCNB1* (alias *cyclinB*)). *BIRC5*, encoding an inhibitor of apoptosis, has previously been found up regulated in MPNSTs compared to neurofibromas and is also here found predominantly expressed in MPNSTs. Interestingly, this approach also revealed an over-expression in MPNST compared to their benign counterpart of both a previously identified drug target (*TOP2A*), as well as of druggable target genes (*AURKB*, *RRM2*, *PBK*, *TK1*, *TTK*) novel to MPNSTs. The increased expression of these genes was verified using quantitative real-time PCR.

L30 Late events in osteosarcoma survivors: What can we learn from clinical trials in amputation versus limb salvage?

G. Ottaviani[1,2], R.S. Robert[1], W.W. Huh[1], S. Palla[1], N. Jaffe[1]

[1]Children's Cancer Hospital, The University of Texas M.D. Anderson Cancer Center, Houston, Texas, USA; [2]MED-08 Anatomic Pathology, Dipartimento di Scienze Materno-Infantili, University of Milan, Milan, Italy

Introduction: Limb salvage surgery using endoprosthesis, allografts or reconstructions is applied in about 85% of patients affected by osteosarcoma of the middle and/or distal femur. For the long term survivors one drawback in limb-salvage surgery is that endoprostheses have a limited duration and long-term prosthetic failure leading to reoperation remains a serious problem. The purpose of this work is to evaluate the long term functional and quality of life results of limb salvage procedure compared with amputation in osteosarcoma survivors.

Patients and methods: 112 osteosarcoma of the limb survivors, aged 16 to 52 years of age, treated between 1972 and 2005, <20 of age at diagnosis were enrolled to this study.

Results: Among those who replied to the questionnaire, no significant differences existed in functional or psychological outcomes between survivors with limb salvage and those with amputation.

Conclusion: In limb-saved long term osteosarcoma survivors, after endoprostheses failure and repeated surgical procedures, the decision to undergo additional limb salvage procedures is difficult and multifaceted. Amputee survivors had a similar psychological and quality of life outcome compared to limb salvage survivor.

L31 Health in bone sarcoma survivors

L.H. Aksnes[1], H.F.C. Bauer[2], N.L. Jebsen[3], G. Follerås[4], H. Lernedal[2], L. Hjorth[5], C. Allert[2], G. Haugen[1], K. Sundby Hall[1]

[1]Dept of Oncology, The Norwegian Radium Hospital, Rikshospitalet University Hospital,Oslo, Norway, [2]Orthopedic Oncology Service, Karolinska University Hospital, Stockholm, Sweden, [3]Centre for bone-and soft tissue tumours, Haukeland University Hospital, Bergen, Norway, [4]Dept of ortopaedic surgery, The Norwegian Radium Hospital, Rikshospitalet University Hospital, Oslo, Norway, [5]Dept of Paediatric Oncology, Lund University Hospital, Lund, Sweden

Objective: To survey Quality of Life (QoL), functional outcome and long-term morbidity among long-term Extremity bone sarcoma (EBS) survivors.

Patients and material: 133 EBS survivors (>15 years of age) were mailed a questionnaire containing short form 36 (SF-36), Hospital Anxiety and Depression Scale (HADS), fatigue questionnaire (FQ) in addition to demographic data and questions concerning health issues. Function was evaluated according to the Musculoskeletal Tumor Society scoring system (MSTS) and Toronto Extremity Salvage Score (TESS). 110 EBS survivors had physical examinations at the out-patient clinic. SF-36, HADS and FQ findings in addition to somatic diseases and symptom complaints were compared to age and sex adjusted norm data (NORMs).

Results: The EBS survivors had higher fatigue scores. Depression scores and all physical dimensions of QoL showed lower scores than NORMs. The amputees had lower MSTS scores than those with limb sparing surgery, but no difference for the TESS. 42% had $\geq$1 somatic disease, 33% had ototoxicity, and 13% had reduced renal function. EBS survivors were more likely to have heart disease (odds ratio [OR], 7.9; P=0.001), hypertension (OR, 3.4; P=0.03) and thyroid disease (OR, 3.0; P=0.04) and reported more diarrhoea (29% versus 19%, P=0.02), palpitations (23% versus 13%, P=0.01) and shortness of breath (11% versus 5%, P=0.01) than NORMs.

Conclusion: Most of the EBS survivors manage well, but have poorer health status than age and sex matched controls. Long-term follow-up is therefore mandatory.

L32 High-dose Methotrexate – has the time come for common procedures?

L. Våde, I. Nordhagen

The Norwegian Radiumhospital, Oslo, Norway

Introduction: The objective was to identify and chart medical procedures in connection with HD MTX treatment of sarcoma patients at hospitals in Norway, Sweden and Denmark.

Methods: Questionnaire filled in by two nurses, based on interviews with individual nurses at 14 different wards in 12 hospitals in the 3 countries.

We have mapped the procedures being used, but will concentrate on the following issues:

- Eating and drinking restrictions
- Procedures for the prevention of oral mucositis
- Restrictions on medication
- Administration of Folinic Acid (Leukovorin)

Results: The procedures are not consistent in the 12 hospitals asked. The procedures during a MTX-course for an individual patient, depend on the routines for each hospital. There are no common procedures for hospitals in Scandinavia.

Conclusion: If the patients in Scandinavia shall get the same procedures during a MTX-course, the hospitals in Scandinavia which treat sarcoma patients needs to cooperate to make common guidelines.

L33 Transcultural caring relationships

P. Pergert

Dept of Barncancerenheten, Astrid Lindgrens Barnsjukhus, Karolinska Institutet, Stockholm, Sweden

Introduction: Cancer in children entails a demanding treatment and a long period of cumulative stress for the entire family. Further, Sweden has become increasingly multicultural resulting in a need for studies in transcultural care. Obstacles to transcultural caring relationships emerged in a previous study as a main concern of healthcare staff, and to resolve this they used tools in bridging obstacles. The purpose of this study was to gain knowledge about the experiences of foreign-born parents in paediatric oncology in Sweden.

Patients and methods: Using purposive sampling 11 interviews were conducted with foreign-born parents in paediatric oncology, 4 with an interpreter. Data were analyzed according to Grounded theory.

Results: Foreign-born parents' often feel that they are in a position of powerless dependence. Their need to struggle on, accounts for much of their behaviour, which includes ways of resourcing and *protecting self-interest in health care*. The latter includes approaches in interaction with healthcare staff and include; trustful cooperation, fighting and despondent surrendering.

Conclusion: This study provides an understanding of parent's approaches and the importance of bridging obstacles to transcultural caring relationships and working for trustful cooperation in the common fight against childhood cancer.

L 34 Healt-related Quality of Life, school and social interaction with friends during childhood cancer treatment

M. af Sandeberg

Dept of Barncancerenheten, Astrid Lindgrens Barnsjukhus, Karolinska Institutet, Stockholm, Sweden

Background: Undergoing treatment for cancer during childhood may cause physical, emotional, and social concerns and thus have an impact on health-related quality of life (HRQOL). Absence from school and loss of friends is a problem among children treated for cancer. Symptoms related to disease and treatment such as fatigue, pain, nausea, sore mouth and constipation are frequently described as reasons for school absence. However few researchers have actually investigated absence from regular school and it's relation to HRQOL.

Purpose: We followed HRQOL in children undergoing treatment for cancer to explore potential relationships between HRQOL and school attendance.

Method: During a 2-year-period, all school-children in Sweden starting treatment for cancer were invited to participate in the study. 101 participants were assessed 3 times during the first 5 months of treatment using 2 questionnaires: Disabkids Chronic Generic module (DCGM-37) measuring HRQOL and a study-specific questionnaire measuring school attendance and social interaction with friends.

Results and conclusion: We found a diminished HRQOL that remained stable over the study period with girls rating worse HRQOL than boys. School attendance increased over time and approximately half of the children attended school 5 months after start of treatment. Children with osteosarcoma were less likely than children with other diagnoses to attend school. Self-reported HRQOL was positively correlated to days of school attendance. The results emphasize the importance of psychosocial care and nursing for children diagnosed with cancer, especially for girls. Research to further explore sex differences in HRQOL among children diagnosed for cancer is recommended.

L35 Tanker om den vanskelige samtalen

S. Granlien, S. Rian

Radiumhospitalet, Oslo, Norge

Det å gå inn i vanskelige samtaler med pasienter er en del av jobben med å være sykepleier. Likevel er dette noe som kan være både utfordrende og skremmende, og vi blir aldri utlært i det. Når vi derimot føler at vi håndterer en vanskelig samtale godt, kan det også være en av de mest tilfredsstillende sidene ved jobben.

Det å få til en god samtale krever en del av oss som sykepleiere og som mennesker. Det krever tid, tilgjengelighet, mot til å våge, å ha evne til å lytte, vi må være forberedt på å få både ris og ros, det krever at vi har kunnskap om kommunikasjon og hvordan vi skal tilrettelegge for en god samtale.

Fra pasientens ståsted vil det å få en god samtale om vanskelige temaer kunne være av uvurderlig betydning. Det i seg selv å snakke om vanskelige tanker og problemer – kan gjøre dem mer håndgripelige og lettere å håndtere. I tillegg sitter vi som sykepleiere på faglig kunnskap og erfaring som kan være viktig for pasienten, men vi er likevel avhengige av å kunne formidle det til pasienten på en konstruktiv måte.

L36 Veien tilbake til livet og hverdagen etter sarkombehandling

S. Lindberg, K. Bach Fossda

Spesialsykehuset for Rehabilitering, Stavern (SSR), Norge

- Kort presentasjon av SSR, med definisjon av rehabilitering og tverrfaglig samarbeid.
- Rehabililitering – et ledd i å komme tilbake til hverdagen etter sarkombehandling.
- Hva kjennetegner sarkompasienter som kommer til SSR for et planlagt rehabiliteringsopphold?
- Målsettingsarbeid, et ledd i å se fremover og fokusere på livet og hverdagen som ligger foran.
- ”Ett skritt frem – og to til” – en pasienthistorie.

L37 Hvorfor skal jeg bare ligge på sengen?

T. Kollenborg

Radiumhospitalet, Montebello, Oslo, Norge

Fritidsleder viser lysbilder fra diverse aktiviteter som gjennomføres mens pasientene er til behandling for sin kreftsykdom.

Tiden faller ofte lang for mange, med behandling i bare en liten stund hver dag. Hva skal resten av dagens fylles med? Hvorfor ikke bli med på en aktivitet som gjør at du får et "frikvarter" fra sykdommen og fokus på noe som er hyggelig?

Døren alltid åpen når jeg er på jobb, så det er lett å stikke innom. Både nye pasienter og pårørende er velkomne.

Gamle pasienter kommer ofte innom når de er på kontroll. Slik får jeg masse informasjon om hvordan de har det under og etter behandling. De deler sine gleder og sorger med meg – og noen ganger er vi så heldige at de kan delta på et arrangement som interesserer dem.

L38 Sygepleje til unge - sådan plejer vi den unge patient i Århus, Danmark

N. Hove

"Ungdomsafsnittet", Onkologisk afdeling D1, Århus universitets hospital, Århus C, Danmark

Når et ungt menneske får diagnosticeret en knogletumor så ændres livet fuldstændigt. Den naturlige proces med at løsrive sig fra forælder bliver med ét erstattet af en afhængighed af forældrene. Det de fleste unge mennesker tager for givet som ex. skolegang, fester, det at have en kæreste osv., bliver sat på " stand by". I stedet bliver dagliglivet erstattet af hospitalsindlæggelser, behandling, bivirkninger og adskillelse fra det såkaldte normale hverdagsliv. Sygeplejen og behandlingen til et ungt menneske er en stor udfordring for os i det multidisciplinære team. Teamet består af mange forskellige faggrupper. At støtte den unge patient og dennes familie er en af hjørnestenene i vores sygepleje.

I Danmark, eller for den sags skyld i Skandinavien, har der ikke været nogen tradition for at have specielle afdelinger til unge patienter. "Ungdomsafsnittet" i Århus er indtil nu det eneste sted hvor unge onkologiske patienter har deres eget afsnit. Gennem et behandlingsforløb, der ofte tager flere måneder, hjælper vi den unge patient og familien med at bibeholde så mange af de dagligdags rutiner som muligt.

Mit indlæg vil primært handle om de specielle tilbud vi har udviklet til den unge patientgruppe på onkologisk afdeling i Århus.

- Et anderledes ungt miljø på sengestuerne og et "Ungdomshjørne"
- Netværksmøde
- "Forældrefritid"
- Rehabilitering
- 2 kontaktsygeplejersker til hver familie
- Samtaler i det ambulante forløb.

Afdelingen startede som et pilotprojekt i år 2000–2002, er nu en del af de tilbud Onkologisk afdeling på Århus universitets hospital har. I Århus behandler vi patienter fra Vestdanmark og Fyn. Danmark er et lille land med - heldigvis - ganske få unge patienter. Disse unge patienter har specielle behov og derfor har vi udviklet den specielle ungdomssygepleje. Det er vores håb at ideen om ungdomssygepleje vil sprede sig, så rigtig mange unge vil få fordel af vore erfaringer.

L39 Oro och nedstämdhet hos personer som har behandlats för osteo- eller Ewingsarkom.

H. Lernedal

Ortopedonkologiska avdelningen, Karolinska Universitetssjukhuset, Solna, Sverige

Ungefär 30 personer, de flesta barn eller tonåringar, får i Sverige varje år osteosarkom eller Ewingsarkom vilket leder till en lång tid på sjukhus. Eftersom det är ovanliga sjukdomar med omfattande cytostatikabehandlig och avancerad kirurgi, behöver dessa patienter omhändertas av specialiserad personal. Detta gäller både det medicinska omhändertagandet och omvårdnaden.

Man vet lite om livskvalitet och senbiverkningar efter avslutad behandling. Vi studerade självrapporterad oro, nedstämdhet och livskvalitet hos 71 personer median 16 år efter avslutad behandling för osteosarkom eller Ewingsarkom. Vi använde en enkätundersökning med frågeformulär, Hospital Anxiety and Depression Scale (HADS) och en fråga om upplevd livskvalitet senaste veckan. Data ingår i en större nordisk multicenterstudie och i en C-uppsats kommer resultat av HADS och livskvalitet att redovisas.

Närmare 20 procent skattade förhöjd nivå av oro eller nedstämdhet som inte var relaterat till kön, ålder vid diagnos, år sedan operation, ålder vid undersökningens genomförande, lokalisation av sarkomet eller typ av kirurgi. Flertalet skattade sin livskvalitet som hög. Det gick inte att avgöra om oro och nedstämdhet, som var negativt relaterade till livskvalitet, berodde på den genomgångna behandlingen. Sammanfattningsvis verkar personer som genomgått behandling för sarkom må ganska bra i det långa loppet.

L40 Aloxi (Palonosetron) – en ny seratoninantagonist

B. Augdal
Oslo, Norge

L41 Ernæring, et felles ansvar

K. Mac Quarrie, A. Bøen

Radiumhospitalet, Oslo, Norge

Sarcompasienten får ofte en tett og tydelig oppfølging av sin cansersykdom. Diagnose og behandling blir gjennomgått svært detaljert og behandlingsforløpet er langt. I forløpet er mange faggrupper involvert og alvorligheten av sykdommen er jevnlig presisert. Det er da de grunnleggende friske temaene ofte kan falle ut og særlig viktigheten av ernæring.

Blir ernæring en enkelt fagpersons ansvar er sjansene store for at det ikke blir en optimal oppfølging for pasienten. Samarbeidet mellom legene og pleiegruppen er svært viktig, men øvrige fagpersoner bør ha innsikt i pasientens ernæringsstatus for å kunne bidra til optimal oppfølging på helheten for pasienten.

L42 Illamående i cancervården – ett antiemetika projekt på Radiumhemmet i Stockholm

K. Wieselblad, L. Smedberg
Karolinska sjukhuset, Stockholm, Sverige

Trots framsteg med antiemetikabehandling mot illamående, finns aktuella studier som påvisar att illamående och kräkning fortfarande tillhör de symptom som påverkar livskvalitéten för patienter med cancerdiagnos som behandlas med cytostatika.

Med hjälp av rätt antiemetikabehandling, förbättrad omvårdnad och alternativa behandlingsmetoder menar vi att patienten får en förbättrad livskvalitèt i samband med den onkologiska behandlingen.

På onkologiska kliniken på Karolinska Universitetssjukhuset pågår ett projekt för att förbättra antiemetikabehandlingen för samtliga cancer-patienter. Samarbetet sker tillsammans med Linköpings Universitetssjukhus och utbildning för sjuksköterskor har genomförts på olika platser i Sverige.

Sarkom är en ovanlig tumörsjukdom och behandlingen är många gånger lång och svår. Patienten är inneliggande långa perioder där kirurgi, cytostatika och strålbehandling kan pågå upp till ett års tid.

Sarkompatienterna i Stockholm vårdas på Radiumhemmets avd P54 och tillsammans med vårdpersonalen där har nya riktlinjer utfärdats för att minska patienternas illamående. Samtliga cytostatikabehandlingar har genomarbetats och antiemetika har givits enligt framtagna riktlinjer med individuell anpassning.

L43 PhaSeal – Sluten hantering av toxiska läkemedel

C. Hallberg
Carmel Pharma, Göteborg, Sverige

L44 Sårbehandling til patienter, der har fået fjernet et sarkom

B. Hedehaard, A.S. Koch
Århus sygehus, Århus, Danmark

På afdeling E5, Århus sygehus har vi ofte patienter indlagt, der får fjernet et sarkom og efterfølgende får strålebehandling af området. Vi har i løbet af de sidste par år haft forløb, hvor patienten indlægges igen med infektion og sårhelingsproblemer i det strålebeskadigede væv. Sårhelingen har været ofte været langvarig og kompliceret.Vi har anvendt kirurgisk oprensning, VAC behandling (vaccum assisted closure), larve-terapi, muskeltransposition, delhudstransplantation. På baggrund af ovenstående behandlinger har vi opnået heling af komplicerede og udsigtsløse sår. Resultaterne kan anvendes til andre patientgrupper ex. Andre tumorpatienter og infektionspatienter.

L45 Knokkel-rekonstruksjon etter sarkom-kirurgi

O-J. Norum

Avdeling for onkologisk kirurgi, Radiumhospitalet, Oslo, Norge

Før introduksjon av kjemoterapi mot ben sarkomer var standard-behandlingen amputasjon. Langtidsoverlevelsen var lav og det ble ansett som uhensiktsmessig å utsette pasientene for avanserte rekonstruksjoner. Protesene var heller ikke like gode som nå. Etter introduksjon av kjemoterapi på 80-tallet opereres over 90 % av pasienter med ekstremitets-bevarende kirurgi der større partier av ben, eller hele knokkelen, blir fjernet. Opptreningen etter operasjon, og det endelige funksjonelle resultatet, er avhengig av hvilke anatomiske strukturer som er fjernet i tillegg til skjellett, (musker, sener, nerver og/eller blodkar) samt hvilken rekonstruksjons-metode som er benyttet. I foredraget vil jeg legge vekt på de vanligst knokkel-rekonstruksjoner som er i bruk ved Radiumhospitalet i Oslo.

Ingen rekonstruksjon: Noen ben kan fjernes, og ikke erstattes, uten at funksjonstapet blir betydelig: **deler** av fibula i leggen, radius eller ulna i underarmen, clavicula, scapula, bekken skjellett og ryggvirvler.

Proteser: Alle lange rørknokler og store ledd kan rekonstrueres. Moderne reseksjonsproteser gir stor fleksibilitet og muligheter for individuell tilpasning. Ulemper med proteser er risiko for mekanisk løsning, brekkasje og slitasje av komponenter. Våre pasienter er ofte unge og vil bruke sine proteser i mange år. Den post operative infeksjonsraten ved bruk av reseksjonsproteser ligger på ca 10 %.

L46 Fysioterapi ved rekonstruksjoner hos sarkompasienter

H. Blegen, G.S. J. Haugen, M.L. Johansen

Seksjon for Kreftrehabilitering, Radiumhospitalet, Oslo universitetssykehus, Oslo, Norge

Ortopediske rekonstruksjoner i bekken, hofte og kneledd hos sarkompasienter er store inngrep som krever tett oppfølging med fysioterapi i etterkant for å oppnå best mulig funksjon. Det er imidlertid flere utfordringer i forhold til opptrening etter en rekonstruksjon. De fleste pasientene får både pre- og postoperativ kjemoterapi, noe som kompliserer opptreningsforløpet. I flere tilfeller innebærer også det kirurgiske inngrepet både kar rekonstruksjon og hudtransplantasjon. Dette medfører flere restriksjoner ved mobilisering, samt forlenget immobiliseringsperiode. Vi har sett på alle rekonstruksjoner utført på sarkompasienter ved Radiumhospitalet i tidsrommet 2005-2008. Av disse har vi plukket ut rekonstruksjoner som er gjort i bekken/ hofte og kne, totalt 35 pasienter. Av disse er det 15 rekonstruksjoner i knær, 18 i hofte/bekken og 2 totale femurproteser. Vi har sett på hvor mye fysioterapi disse pasientene har fått gjennom sitt behandlingsforløp på sykehuset og hva slags fysioterapitiltak de har fått. Disse pasientene har til sammen fått 2196 behandlinger, i snitt 63 behandlinger pr. pasient. Noe som kjennetegner fysioterapitiltakene er omfattende og tidkrevende mobiliseringer. Tromboseprofylakse, lungefysioterapi, smertebehandling, kontrakturprofylakse, lymfødem-behandling og generell opptrening er andre tiltak disse pasientene har fått.

L47 Genoptræning af overekstremiteter med og uden anvendelse af protese, ved patienter med sarkom

E. Rasmussen, H. Brandt Andersen
Köpenhamn

Præsentation af den ergoterapeutiske intervention til patienter, der p.gr.a. bløddels- eller hårde sarkomer i knoglevævet er blevet opererede i skulder/albue/hånd og har fået

- fjernet tumor og indsat resektionsprotese/skulderalloplastic
- fået fjernet tumor i muskulatur og knogle
- fået fjernet tumor ved amputation.

Der bliver lagt vægt på følgende, også med patienteksempler:

- den akutte fase efter operationen – genoptræning og begyndende brug af armen til daglige aktiviteter
- den specifikke genoptræning og hjemmetræningsøvelser
- fortræning med temporær armprotese
- træning med endelig armprotese
- instruktion i brugen af armen til daglige aktiviteter, til trods for manglende/nedsat funktion af armen
- eksempler på hjælpemidler, der kompenserer for den manglende/nedsatte funktion af armen.

L48 Prinsipper for – og eksempler på – balansetrening

L-A. Andersen
Bergen, Norge

L49 Presentasjon av ”Sarkomforum for sykepleie og fysioterapi på Radiumhospitalet”

L50 Primærsykepleie til sarkompasienter, hvorfor?

J. Marstein
Oslo

L51 En pasients historie