

Radiation Oncology Annual Scientific Meeting 2022
Faculty of Radiologists and Radiation Oncologists
Royal College of Surgeons

September 28th – 30th 2022

Abstracts – Poster Presentations

Radiation Induced Meningioma, Institutional case series

O. Monaghan, G, Rangaswamy, C. Faul
St Luke's Radiation Oncology Network, Dublin

Purpose

There is evidence that low and high dose radiation treatment can cause secondary brain tumours. Clinically, radiation-induced meningiomas (RIM) are often aggressive with atypical histology and have long latency interval between initial radiation and tumor onset. These tumors behave differently to sporadic meningiomas and are frequently calvarial, multiple and with high recurrence rates following surgery or radiotherapy.

Materials and Methods

Our study focuses on 3 cases of RIM after initial radiation treatment in adulthood and also 1 case of RIM after radiation in childhood. We looked at multiple variables in each case: latency time, dose of radiation, location of recurrence, grade of meningioma and treatment.

Results

The median latency time was 17years. Within the adult patients the lesion was detected on surveillance imaging. The child RIM case was detected due to new onset symptoms. The adult cases included diagnosis of Grade 3 astrocytoma and pituitary adenomas. They received 60gy/30fr and 45gy/25fr. The RIM was located in the low dose field of radiation. The child case underwent CSI (24gy/12fr) for ALL. Two of the four cases had surgery upfront confirming atypical meningioma grade

2. The other 2 were radiologically diagnosed. All cases had fractionated or SRS radiation treatment.

Conclusion

The cumulative risks of secondary brain tumors following radiotherapy are 8.9% at 10 years. The largest literature review to date reported a latency period onset of 22.9 \pm 11.4 years. Our study reports RIM location was in low dose region of radiation field and latency time was median 17years. This case series further supports diagnosis and management of RIMs.

Variations in dosimetry between ultrasound and CT in low-dose rate prostate brachytherapy planning

RM Dunne, A Zuchora, L Berrigan, N Ibrahim, C
Small Dept. of Radiation Oncology, University
Hospital Galway

Purpose

The National Comprehensive Cancer Network (NCCN) recommends low-dose rate prostate brachytherapy (LDR BT) as a possible treatment option as mono-therapy for low-risk and favourable intermediate risk prostate cancer and also as a boost in addition to external beam radiotherapy (EBRT) for unfavourable intermediate risk prostate cancer¹. This study aims to investigate the discrepancies in dosimetry between ultrasound (US) and CT in prostate brachytherapy planning.

Materials and Methods

31 patients that underwent LDR BT between 2010 and 2022 were randomly selected by computerised random selection. LDR BT boost was performed by permanent I125 seed implantation 106Gy, four to six weeks following the completion of EBRT. Dosimetry results taken during LDR BT planning were collected and the results from US and CT were compared using SPSS²⁶.

Results

CT typically showed a larger prostate volume by 2.77cc in comparison to the prostate volume measured using US. The mean D90 prostate was 5.7Gy higher and R2cc rectum 7.01 Gy higher when measured using US in comparison to CT. The mean UD30 urethra measured using US was 2.05Gy greater than the mean UD30 urethra measured using CT.

Conclusion

CT is known to overestimate the delineation of the prostate while image quality, which is particularly affected by the needles in brachytherapy, is the major challenge when using ultrasound². The brachytherapy seeds and needles cause oedema and subsequent distortion of the prostate, as well as sonographic distortion³. These variations are challenging for the brachy-therapist, as precise dosimetry is both desirable and necessary.

Audit of timing of chemotherapy and radiotherapy for patients planned for radical chemo radiotherapy for non-small cell lung cancer (NSCLC) in the St Luke's Radiation Oncology Network (SLRON)

E Ruane, N Elbeltagi

St Luke's Radiation Oncology Network, Dublin

Purpose

Concurrent chemoradiotherapy is a recommended definitive treatment for stage II/III non operable NSCLC. Our local SLRON guidelines advise that radiotherapy should commence as close as possible to cycle 1 of chemotherapy. A meta-analysis of 1205 patients by Auperin et al. showed improved outcomes for patients who received concomitant chemoradiotherapy as compared with sequential chemoradiotherapy. The aims of this audit are to identify the proportion of patients planned for definitive chemoradiotherapy for NSCLC who started radiotherapy within cycle 2 of chemotherapy

Materials and Methods

A list of all patients who completed radical chemoradiotherapy for NSCLC between January 2021 and January 2022 was obtained from our electronic patient records (Aria). A chart review was performed on all patients. Data collected included start date of chemotherapy and radiotherapy

Results

49 patients were identified. In 46 cases, RT start date was within cycle 2 of chemotherapy. 3 cases were identified with a delay ranging from 8-24 days between cycle 2 and radiotherapy start date. Referral pathway and planning process were identified areas of delay.

Conclusion

>90% of patients started treatment within cycle 2 of chemotherapy and were compliant with our local guidelines. To improve this further we recommend reviewing the referral pathway and early identification of complex patients during target volume delineation which may cause delays in treatment start date.

Intracranial meningioma with extra cranial extension to the scalp

Aoife L. Bell, Amir Nadzif, Guhan Rangaswamy, David

Fitzpatrick St Luke's Radiation Oncology Network, Dublin

Purpose

Meningiomas are the most frequent primary central nervous system tumours accounting for over one-third of primary brain and spinal tumours. Extension to extracranial sites is unusual and extension to the scalp is rare.

Materials and Methods

This case describes a 76-year-old female with a slowly enlarging scalp mass, identified on serial imaging for surveillance of a recurrent meningioma. The patient was diagnosed with a Grade 2 left parasagittal meningioma 13 years ago with initial surgical excision. She had a further surgical resection for recurrence 4 years later followed by Volumetric-Modulated Arc Therapy for surgical cavity recurrence the following year.

Results

18 years after initial diagnosis, surveillance magnetic resonance imaging, demonstrated an increase in size of a left parafalcine mass, a left parietal mass and a new enhancing right parietal mass, invading into the superior sagittal sinus. It also revealed a significant increase in size of a solid, enhancing, lobulated right parietal scalp mass, initially described on a CT brain 2 years earlier. The patient reported no neurological symptoms, however reported tenderness of the scalp lesion. Subsequent biopsy of the scalp lesion revealed a WHO Grade 2 atypical meningioma. The patient was reluctant for surgical excision of the cutaneous meningioma and elected for palliative radiotherapy to the scalp lesion. Stereotactic radiosurgery to the intracranial lesions will be considered in the future, should neurological symptoms develop.

Conclusion

This case describes a rare incidence of intracranial meningioma with extracranial extension to the scalp and highlights the possibility of extracranial extension of a meningioma, following 7 years of stable intracranial disease

Rate of Mortality Following Palliative Radiotherapy: A Retrospective Audit of the St. Luke's Radiation Oncology Network

C Murphy, G.Rangaswamy, D Fitzpatrick
St Luke's Radiation Oncology Network, Dublin

Purpose

Palliative radiotherapy (PR) plays an important role in pain relief, oncological emergencies and local disease control. Fitness for treatment is decided prior to planning CT. For patients in the final weeks of life, the side effects of PR may outweigh the benefits.

Materials and Methods

We performed a retrospective analysis of all patients in the St. Luke's Network who were assessed for PR in October 2021 (n= 135). Population characteristics including primary malignancy, treatment site/dose fractionation, performance status (if documented) and inpatient status at the time of radiotherapy was noted. Mortality data was extracted from ARIA, NIMIS and Rip.ie. Deaths within 1, 2 or 3 months of radiotherapy were recorded, as were those who died prior to planning CT or commencing treatment.

Results

The median age was 70 (53% female). Lung was the most common primary malignancy (n=46, 35%), with spine being the most commonly treated site (n=44, 33%). 40% of the patients treated were current hospital inpatients. 18 patients (13%) died within 1 month of their radiotherapy completion date, with a further 17 patients by 3 months. In addition, 10 died before their start date and 3 before CT sim. There was a strong correlation between current inpatient status and poor mortality outcome, with 11 (85%) of those who died prior to commencing radiotherapy and 10 (56%) of those who died within the first month being hospital inpatients. Performance status was documented in 39%.

Conclusion

Patients receiving PR often have advanced cancer and low clinical reserve. Rapid deterioration can occur, especially if requiring hospital admission due to concurrent illness or disease burden. Performance status and fitness for treatment should be assessed prior to proceeding with planning.

PSA availability at prostate cancer follow up appointments

G Farmer, M Cunningham

St Luke's Radiation Oncology Network, Dublin

Purpose

The COVID-19 pandemic has created challenges to the ways in which we deliver outpatient services. A large number of consultations are conducted virtually and a challenge this poses is ensuring that patients have the relevant information available. Patients on follow up for prostate cancer require an up to date PSA result. We reviewed PSA availability at outpatient appointment in a population undergoing prostate cancer surveillance, the majority of which were virtual consultations.

Materials and Methods

We conducted a retrospective review of clinic attendances over a six-week period from October to November 2021 by reviewing clinic notes. We recorded availability of patients, and PSA results at the time of appointment.

Results

25% of patients had no PSA result available at the time of clinic review. Of these 54 patients; 35% of appointments were rescheduled prior to clinic, 28% had bloods taken with their GP but results had not been received prior to review nor were the patients aware of the result, these patients were called during the clinic and required a further appointment to review their results. 5% of this cohort were patients who attended the clinic in person and attended phlebotomy at the time of review, but required a further appointment to review the result.

Conclusion

Without necessary test results a significant proportion of patients required rescheduled and additional appointments, creating additional workload for clinical and administrative staff. We introduced a letter to remind patients of their upcoming appointment and need for PSA test. We are currently reviewing the impact this initiative has had.

An audit of re-scans for radical head & neck radiotherapy at St Luke's Radiation Oncology Centre at Beaumont Hospital

P Sharma, J Nicholson, G Rangaswamy, O McArdle
St Luke's Radiation Oncology Network, Dublin

Purpose

Standard of care for radical treatment of head and neck cancers require that treatment should start within 6 weeks of diagnosis. For delivery of this treatment, our tertiary centre accepts a planning re- scan rate of 10% to include non-modifiable reasons such as patient and disease factors. Re-scans and subsequent re-plans introduce delays in providing an efficient service and can impact the disease course and outcomes. The aim of this audit was to investigate and identify modifiable factors resulting in re-scans for radical radiotherapy for head and neck cancers.

Materials and Methods

A retrospective analysis revealed that 92 patients started radical treatment for head and neck between January and September 2021. Patient demographics and reasons of re-scans was obtained from electronic medical records.

Results

17 (18.5%) of the 92 patients required re-scans during the course of their radiotherapy. Variable reasons included patient factors, disease factors and set up issues during CT and treatment. Set up issues was the largest factor (53%). The non-modifiable factors resulted in 8/17 (47%) of the re-scans. Only 1 re-scan resulted in a treatment break. 7/9 (77%) of setup re scans were due to non-reproducible patient positioning and rest due to amendments at planning review stage.

Conclusion

The audit has shown that the majority of the re-scans were due to modifiable factors such as set up issues. This resulted in mismatch of structures and poor coverage was identified during the course of treatment. Future re-audit should be performed after reviewing patient education given at planning CTs, immobilization techniques used and comparison of headrests.

Radiotherapy for Dupuytren's disease - a case series

F Walkins, G Rangaswamy, O Salib

St Luke's Radiation Oncology Network, Dublin

Purpose

Dupuytren disease (DD) is a benign fibroproliferative disorder of the palmar fascia of the hand/fingers. While there is no cure, therapeutic approaches aim to prevent disease progression and improve hand function. Radiotherapy can prevent disease progression in early DD and we report on our institution's experience with its use thus far.

Materials and Methods

A retrospective chart review of 3 patients who were treated radiotherapy for DD was performed. **Results**

All 3 patients had early DD with nodules and cords but no evidence of contractures. History and physical exam findings were documented and clinical photographs were taken. Informed consent was obtained and patients were counselled about the risk of skin changes, treatment failure and second malignancy. All palpable disease was outlined on the skin and a margin of 1 cm was outlined. Superficial/Contact X-ray therapy (CXT) was delivered at 125 kV using appropriate applicators. Customized cutouts were used to shield uninvolved areas of the palm. Patients received 30 Gray (Gy) in 10 fractions delivered in a split course: 3 Gy x 5 Frs in 1 week followed by an 8 week break followed by a further 3 Gy x 5 Frs in 1 week. Side effects during treatment were recorded. Initial follow up appointments were arranged at 3 months.

Conclusion

This is a report of our institution's experience thus far with radiotherapy for DD. Outcomes and toxicities will be recorded.

Role of radiotherapy in brain metastasis from EGFR mutated NSCLC- a case report

P Sharma, D Fitzpatrick, P Thirion

St Luke's Radiation Oncology Network, Dublin

Purpose

Lung cancer represents significant clinical burden worldwide with NSCLC being the commonest (84%). The incidence of EGFR mutation in Europe is reported to be lower (14.1%) compared to Asia (38.4%). 25-45% of EGFR-mutant NSCLC patients develop brain metastases (BM), compared to 15-30% in EGFR wild-type patients. EGFR mutated NSCLC is associated with improved overall survival (OS) with a median OS of 35 months and an OS of 74% at 2 years. Tyrosine-kinase inhibitors (TKIs) are used in conjunction with local radiotherapy.

Materials and Methods

Patient demographics, tumour characteristics and course of radiotherapy was reviewed from electronic medical records.

Results

We present a case of a 60 year old gentleman, non-smoker who presented with EGFR-mutated NSCLC with BM at diagnoses. He received WBRT (30Gy/10#) at outset while on first generation TKI followed by SRS (18-20Gy/1# to 2 sites). Intracranial POD was managed with further radiosurgery (25Gy/5#) after 2 years and surgical resection after 4 years with extra-cranial disease control. He presented with primary disease recurrence in 2021 which was surgically resected with adjuvant systemic treatment. Further mediastinal progression in 2022 was treated with thoracic EBRT, with intracranial disease control.

Conclusion

This case illustrates the role of radiotherapy as part of the multimodal treatment approach that is applied in the management of this challenging case. More aggressive local treatment should be considered for EGFR mutated NSCLC due to their favourable outcomes.

Subglottic extension in T1/T2 laryngeal squamous cell carcinoma: does it affect long-term outcomes?

S. Horan, R.Joyce, S.Brennan

St Luke's Radiation Oncology Network, Dublin

Purpose

The gold standard treatment of T1/T2 laryngeal cancers is single-modality treatment with a larynx-sparing approach, either in the form of surgery or radiation. Subglottic lesions are seen more rarely in clinical practice than supraglottic tumours. As a result, there is a paucity of data in this patient cohort. A number of papers, albeit sparse, have studied the prognosis of subglottic extension in glottic tumours. Eskiizmir et al. completed a systematic review which did not show an increase in treatment failure in T2 glottic tumours with subglottic extension {1}. Tuna et al. found no significant difference in outcome for patients with subglottic extension. In addition to this, Levy et al. found that patient with subglottic extension had similar outcomes as other laryngeal cancers {2}. The purpose of this project was to examine the patients in the SLRON network who were treated with radiotherapy for a T1 / T2 laryngeal squamous cell carcinoma between 2017 and 2022, and to assess whether the presence of subglottic extension at diagnosis affected long-term outcomes.

Materials and Methods

A retrospective analysis of 97 patients with T1/T2 laryngeal squamous cell carcinoma treated between 2017-2022 was completed using electronic patient records (Aria).

Results

The patient cohort was extracted by searching for the two dosing regimens used for these tumours (60 Gy/ 25 fractions vs 62.4Gy/ 26 fractions). Diagnosis boxes were also searched for laryngeal cancer. Patients that did not have a diagnosis of T1 / T2 laryngeal squamous cell carcinoma were excluded. Staging was noted for each patient; T1a vs T1b vs T2. Presence or absence of subglottic extension was noted. The modality on which subglottic extension, if present, was seen was noted. The investigations completed at diagnosis for each patient, whether subglottic extension was present or not, was also documented. Statistical analysis will be completed on the patients with respect to overall survival, local recurrence, distal recurrence, salvage laryngectomy and PEG tube insertion.

Conclusion

T1 / T2 laryngeal squamous cell carcinoma with subglottic extension are not seen as commonly in clinical practice resulting in minimal data on long-term outcomes. This study aims to seek clarity on long-term outcomes for this patient cohort who were treated within the St Luke's Radiation Oncology Network from 2017-2022.

Repeating PET-CT post definitive radiotherapy for oropharyngeal squamous cell carcinoma - what is the clinical yield?

D Browne, E Connolly, J Burns M McNamara, O

**McArdle St Luke's Radiation Oncology Network,
Dublin**

Purpose

To establish the yield of repeating post treatment PET-CT in oropharyngeal squamous cell carcinoma (SCC), where initial post treatment PET was inconclusive.

Materials and Methods

Data were collected retrospectively. All patients treated with curative radiotherapy for oropharyngeal cancer at St Luke, 's Radiation Oncology Network (SLRON), Beaumont from 2013 to 2021 for whom p16 status was available were reviewed. TNM 8th edition definition of stage was applied.

Results

141 patients with documented p16 status were treated curatively for oropharyngeal cancer. 102 (72%) were p16+. 39 (28%) were female. 12 (31%) of p16- patients were female. Mean age at the time of treatment was 59.1 years (27.5 - 77.3 yrs). 117 (83%) received concomitant chemotherapy. Post treatment PET was repeated in 45 patients. Of these patients, 18 had a recurrence, and a further 15 subsequently died from disease.

Conclusion

Post treatment PET often demonstrates spurious findings. In our study, 12 patients had a complete response following post treatment PET.