

Cancer pain management: A radiation oncologist approach

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A portion of all cancer patients will experience pain throughout their disease, while management is still a challenge for the treating physician. Pain in cancer patients could be due to tissue damage, nerve compression, and tumor invasion into surrounding tissue structures. The cancer cell itself produces mediators that influence other cells inside the cancer microenvironment and sensitize the nociceptors. So, apart from pharmacological management and invasive strategies of analgesic treatment, decreasing tumor burden with antineoplastic therapy remains significant in the treatment of pain in cancer patients. Radiotherapy offers an efficient and safe method of reducing many focal symptoms. This review describes the effectiveness of radiotherapy approaches to alleviate pain in cancer patients.

Keywords: cancer pain, radiotherapy, palliative

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Extraventricular Choroid Plexus Carcinoma: What is The Optimal Treatment? A Case report

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Background: Choroid plexus carcinoma (CPC) is a rare intracranial neoplasm originated from choroid plexus epithelium. CPC predominantly affects pediatric patients and mostly occurs intraventricular. Herein, a case of extraventricular CPC in an adult is reported. Due to its rarity, literature regarding this topic is barely adequate with none proposed treatment guidelines.

Case Presentation: A 42-year-old male patient presented with progressive headache with slight left-sided weakness. Computed tomography scan demonstrated a mass in the right frontal lobe accompanied with vast edema causing midline shift. Tumor resection was performed, and diagnosis of CPC was confirmed from histopathological findings. The patient then underwent local radiotherapy as adjuvant treatment. Six months later, a magnetic resonance imaging scan identified multiple intracerebral enhancing lesions, indicating a progressive disease.

Conclusion: Surgery is the mainstay of CPC treatment, while radiotherapy is a rational adjuvant treatment. However, standardized treatment has not yet been established, with varying outcomes reported. This

report may provide knowledge on CPC to plan optimal treatment strategy, particularly in radiotherapy settings.

Keywords: Choroid plexus carcinoma, extraventricular, optimal treatment, radiation

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Patients Outcome with Brain Oligometastases Treated with Simultaneous Integrated Boost Technique Using a Dose Combination

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Brain metastases are often considered as the end of life in oncologic diseases. Previously, a standalone Whole Brain Radiotherapy (WBRT) had been the standard of care in the case of single or multiple lesions. Currently, Simultaneous Integrated Boost - Intensity Modulated Radiotherapy (SIB-IMRT) permits the delivery of simultaneous doses within a single therapy to the whole brain and the local lesion, therefore shifting the care expectation from palliative towards curative. This study summarizes the outcome in cancer patients with brain oligometastases that were treated with SIB-IMRT technique. Between April 2020 and April 2021, a total of 30 brain oligometastases patients were treated with the SIB-IMRT technique at Dr. Kariadi General Hospital. Twenty-four patients received a whole-brain dose of 37.5 Gy and tumor dose of 45 Gy, both in 15 fractions. At the 6th month follow-up, complete data of six patients were included. Two out of six patients died within three months after the last dose of therapy. Three patients improved clinically, and one remained with no improvement. Evaluation from imaging revealed mass reductions in two patients, while one patient's metastases were progressing, and the other one showed no change. Additionally, no patients demonstrated cerebral necrosis as a late side effect.

Keyword: Brain metastases, Radiotherapy, SIB-IMRT, Patient outcome

Leptomeningeal Involvement After Nasopharyngeal Carcinoma Treatment: A Case Report

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Background: Leptomeningeal metastasis of nasopharyngeal carcinoma is rare, occurs in less than 5% of patients and typically has a poor prognosis.

Methods:

A case of leptomeningeal metastasis from nasopharyngeal carcinoma is presented.

Results: The patient is a 33-years old female with a history of nasopharyngeal carcinoma stage III, T3N2M0, WHO type III, treated initially by association chemoradiation with the IMRT technique, at a dose of 70Gy in 33 fractions. The tumor was well controlled. The patient complained of bilateral sciatica pain that increased with coughing eighteen months after the completion of RT. On a straight leg-raising test, there was only a slight restriction in bilateral hip flexion. Contrast-enhanced spine MRI revealed nodular enhanced leptomeningeal thickening at the lower spinal cord T4 level until cauda equina, most likely related to leptomeningeal metastasis. Palliative radiation therapy was administered to a field encompassing the T4-cauda equina area using a conformal approach with three fields delivering 35Gy, 3 weeks in 14 daily fractions. To penetrate the central nervous system (CNS), methotrexate was given intravenously every two weeks for three cycles. No evidence of disease at the primary site and metastatic areas on subsequent physical examination and/or imaging with MRI after 6 months of follow-up and satisfactory improvement in neurologic status was also observed.

Conclusions: Patients with good performance status could be treated more aggressively with a multimodal strategy. Radiation therapy is palliative to relieve pain, relieves impaired cerebrospinal fluid flow caused by widespread central nervous system involvement, improves the distribution of intrathecal chemotherapy, and improves quality of life.

Keywords: Leptomeningeal metastases, Nasopharyngeal carcinoma, Radiotherapy

From 2 Years to 2 Weeks Sardjito General Hospital's Radiotherapy Waiting List

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Background: Radiotherapy is part of the multimodal management of cancer around the world. Continuity of therapy of various modalities affects the prognosis of cancer patients. One of the inhibiting factors for

radiotherapy services in the world, especially in Indonesia, is the limited budget for building bunkers and procuring radiotherapy equipment. Policies from the central government and local hospitals do not support radiotherapy services. In 2015-2017, radiotherapy at Dr. Sardjito Hospital experienced a long waiting time, up to 24 months; this had a direct impact on the patient's prognosis and indirectly on the radiotherapy image.

Methods: This is a narrative descriptive case study based on radiotherapy experience at the RSUP. Dr. Sardjito in reducing waiting time and improving quality of radiotherapy treatment

Results: The expected target waiting time for radiotherapy is <1 month. Radiotherapy quality improvement is objectively assessed from patient verification (QA), as well as daily, monthly, and 4-monthly quality control (QC) from linac. Short, medium, and long-term plans are made to that end. The key to this plan is good cooperation and support from hospital management as well as the Ministry of Health.

Short-term plan (1-6 months)

The main focus is to increase the number of irradiated patients in a short period. Things to do in the short-term plan include rescheme the queuing system (separating new regular and paliatif patients); developing remuneration for overtime and emergency; hypofraction; and working with vendors to reduce linac downtime. All of this is done by considering the balance between hospital income and the workability of radiotherapy human resources.

Medium-term plan (6-12 months)

The main focus is to increase the number of human resources to maximize the operation of 2 linacs. Target patients were set at 120-140 patients/day, it takes an additional resource consisting of 1 doctor, 10 RTT staff, and 1 medical physicist, so that the total human resources are expected to be 4 doctors, 24 RTT, and 8 medical physicists. The RTT who have been recruited underwent internal training for 3 months and an internal competency test before being able to work independently. The addition of 1 Treatment Planning System (TPS) Monaco and an upgrade of 3 TPS were carried out to increase planning speed. The merging of services in 2 buildings into 1 server using a fiber-optic network is carried out as a backup in case of damage to one of the linacs so that service to patients is maintained.

Long term plan (>1 year)

The main focus is to improve the equipment quality and establish Sardjito as the main referral radiotherapy center in

DIY - Central Java (especially in the southern area). This program includes the addition of a new linac and the replacement of 13-years-old Elekta Precise linac. Beam matching capability in the new linac is essential to this plan to ensure the daily number of patients is maintained. In 2018, Sardjito received an additional linac, so that with 3 operational linacs the target of patients per day is 180-210.

In November 2018, the waiting time was reduced to 1.5 months and remained until the end of 2019. In 2020 the Elekta Precise linac was replaced with Elekta Versa HD, which has stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) capabilities. Currently, the radiotherapy waiting time has reached 2 weeks.

Conclusions: The waiting time for radiotherapy will determine the prognosis of cancer patients. Good cooperation between relevant stakeholders is very important in tackling the long waiting list of radiotherapy patients. All appropriate and measurable things must be done to reduce the waiting time for radiotherapy.

Keywords: waiting time, waiting list, radiotherapy management, quality improvement, QA QC

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Head and Neck Cancer Patients Profiles and adverse effects in Radiotherapy Department of Andalas University Hospital

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Introduction: Radiotherapy is an essential treatment for head and cancer, and it is proven to increase patients' survival. Andalas University Hospital was one of the main radiotherapy facilities in West Sumatera, with increasing utilization of radiotherapy machines because of new facilities, human resources, and implementation of comprehensive cancer care. The objective of this study was to determine head and cancer patient profiles in Andalas university hospital.

Methods: This study was a cross-sectional descriptive design. Secondary data from medical records were collected in the time range of September 2020 to September 2021. All patients who underwent

radiotherapy treatments were selected in this study. We analysed the patient's characteristics, radiotherapy treatment, and adverse effects.

Results: From this study, we found that 65,8% of the patients were male. 56,5% of the patients were older than 51 years old. Nasopharyngeal cancer (36,8%) is the most common head and neck cancer type with non-keratinizing nasopharyngeal carcinoma histology (23,7%). Most of the patients were in stage IVA (78,7%). Radiotherapy treatment intent was predominantly curative (92%) using the IMRT technique (68%), Mostly radiation total dose ranged from 61 to 70 Gy (86,6%). We found that 56% of patients with 1-4 days radiation gaps. 30% of the patients were experiencing a bodyweight decrease of more than 1kg per week. The most common adverse effect was grade 1 mucositis, grade 1 radiodermatitis, grade 1 dysphagia, and grade 1 xerostomia.

Conclusions: Head and neck cancer patients in Andalas University Hospital were mainly in locally advanced stages, treated with curative intent using the IMRT technique. The adverse effects of radiotherapy were relatively mild.

Keywords: Head and Neck Cancer, Radiotherapy, Adverse effects

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Characteristics and Utility of the Geriatric-8 (G-8) Screening Tools, Haemoglobin, Body Mass Index for the Prediction of Acute Toxicities and Delayed Overall Treatment Time in Elderly patients Treating with External Beam Radiation Therapy at RSCM

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Background: Older patients at a higher risk of being frail. Frailty implies that even a minor stressor can have major negative implications on physical, psychological domains. G-8 screening tool shows good screening properties for identifying vulnerable elderly patients with cancer. We therefore decided to investigate the demographic patient characteristics and utility of G-8 associated with acute toxicity and prolonged OTT in elderly cancer patients especially with head and neck cancer treated with radiation therapy or concurrent chemoradiation.

Methods: A prospective observational cohort study is performed. Patients were eligible if aged 60 years or over and diagnosed with cancer and referred for RT at Department of Radiotherapy Dr. Cipto Mangunkusumo Hospital, Jakarta. We use the G8 questionnaire at consecutive patients before starting RT. We recorded acute toxicity and prolonged OTT and identified potential predictors such body mass index, hemoglobin level, neutrophil lymphocyte ratio, and G8 score.

Result: We investigated 52 patients with a median age of 67 years (range: 60-81). According to the G8 score, 65% of the patients were potentially frail. From all those subjects, 21% had head and neck cancers, 29% gynaecology cancers, 23% breast cancers, 27% other cancers. Eighty one percent (81%) subjects were treated for curative-intent and 19% for palliative RT. Toxicity grade ≥ 3 was observed among 32% subjects who were potentially frail according to the G8 and 0% of subject who were fit ($p=0.007$). Prolonged OTT was observed in 61,8% of potentially frail subject according to the G8 and 27,8 % of subject who were fit ($p=0.020$). The highest decrease Hb levels was in the head and neck malignancy group with a decrease mean Hb level of 1.46 ($p=0.012$). In the gynaecological group there was a decrease in Hb levels of 0.85 ($p = 0.012$), while in the breast and other malignancy group, there was no significant decrease in Hb levels before and after RT. The greatest decrease in BMI pre and post-radiation occurred in the gynaecological malignancy group, where there was a decrease in BMI 1.6 points from baseline ($p<0.001$), followed by head and neck malignancies 1.26 points ($p=0.024$), other malignancies 0.48 points ($p=0.187$) and breast malignancy 0.17 points ($p=0.236$).

Conclusions: G-8 was associated with toxicity grade ≥ 3 and prolonged OTT in older patients with cancer who received RT. Elderly patients with head and neck cancer posed a greater risk for moderate and higher acute toxicity. Future prospective studies should investigate

whether the G8 is a good predictor for other relevant clinical outcomes and survival in our local settings.

Keywords: radiotherapy, G-8, toxicity, frailty, head and neck cancer, overall treatment time.

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Faisal Adam

Background: Choroid plexus carcinoma (CPC) is a rare intracranial neoplasm originated from choroid plexus epithelium. CPC predominantly affects pediatric patients and mostly occurs intraventricular. Herein, a case of extraventricular CPC in an adult is reported. Due to its rarity, literature regarding this topic is barely adequate with none proposed treatment guidelines.

Case Presentation: A 42-year-old male patient presented with progressive headache with slight left-sided weakness. Computed tomography scan demonstrated a mass in the right frontal lobe accompanied with vast oedema causing midline shift. Tumour resection was performed, and diagnosis of CPC was confirmed from histopathological findings. The patient then underwent local radiotherapy as adjuvant treatment. Six months later, a magnetic resonance imaging scan identified multiple intracerebral enhancing lesions, indicating a progressive disease.

Conclusion: Surgery is the mainstay of CPC treatment, while radiotherapy is a rational adjuvant treatment. However, standardized treatment has not yet been established, with varying outcomes reported. This report may provide knowledge on CPC to plan optimal treatment strategy, particularly in radiotherapy settings.

Keywords: Choroid plexus carcinoma, extra ventricular, optimal treatment, radiotherapy

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Cancer Pain Management: Radiation Oncologist Approach

Arry Setiawan

Over portion of all cancer patients will experience pain throughout the course of their disease, and the management of pain is a challenge for the treating physician. Pain in cancer patients could be due to tissue damage, nerve compression, and invasion of the tumour into surrounding tissue structures. The cancer cell itself produces mediators that influence other cells inside the cancer microenvironment and sensitize the nociceptors.

So, apart from pharmacological management and invasive strategies of analgesic treatment, decreasing tumour burden with antineoplastic therapy remains significant in the treatment of pain in cancer patients. Radiotherapy offers an efficient and safe method of reducing many of the focal symptoms. This review describes the effectiveness of radiotherapy approaches aimed at alleviating pain in cancer patients.

Keyword: cancer pain, radiotherapy, palliative

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The Deviceless 4D-CT Sim: Novell experience of working with four-dimensional imaging and motion management

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Introduction: Radiation therapy in continuously moving organs is challenging because of the uncertainty of tumour and organ at risk moving position. The effort to capture the moving target is growing for the interest of targeting the tumour in accurate manner.

Objectives: Deviceless 4D-CT Sim is one among many 4D-CT planning methods, and it has been showing beneficial information in the clinics. The experience of working with, limitations, and the functionality of the system are discussed in this paper.

Result: This is a review of Deviceless 4D-CT Sim method provided with theoretical review and example datasets from the workstations and TPS. Protocols to generating MIP, cine-mode, and phase scans are explained and described.

Conclusion: Deviceless 4D-CT shows functionality in the four-dimensional motion management. The standard function of showing 4D-CT datasets, MIP, MinIP, and cine mode are provided to be processed in the treatment planning for any purposes.

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Chemoradiation for unresectable non-small cell lung cancer: an insight to daily practice

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Lung cancer is the most common leading cause of cancer death in Indonesia. The most common histopathology is non-small cell lung cancer (NSCLC), and most of them presented as an advanced stage. The median survival is still below two years in the last two decades. Radiotherapy is the vital treatment modality for unresectable NSCLC. Adding chemotherapy to radiotherapy could increase the survival outcomes. Overall survival of patients receiving concurrent chemoradiation (CCRT) was better than sequential. The most common CCRT regimens are pemetrexed, etoposide, and paclitaxel combined with platinum-based chemotherapy. The radiation dose is 50 - 70 Gy / 2 Gy per fraction over 6 - 7 weeks. Although the treatment-related death is similar between two groups, the concurrent one added more treatment-related toxicity. The anti-PD-L1 seems to give a promising result after CCRT without adding toxicity. This article will discuss the rationale, technique, implementation in daily and outcomes of CCRT to provide insight for better management.

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The Role of Prophylactic Cranial Irradiation for Non-Small Cell Lung Cancer: A Literature Review

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Lung cancer is the leading cause of cancer mortality in Indonesia, according to 2020 GLOBOCAN data. Lung cancer is divided into two types based on its histology: Small Cell Lung Cancer (SCLC) and Non-Small Cell Lung Cancer (NSCLC). Around 50% of locally advanced NSCLC patients will experience Brain Metastases (BM) over the course of the disease. Prophylactic Cranial Irradiation (PCI) is one of the options used to prevent brain metastases from NSCLC by eliminating the micro metastases before they can clinically manifest. In this brief review, we will investigate various studies regarding the benefits and risks of PCI to find the conclusion regarding its role for NSCLC. We conducted non-systematic searches on Google Scholar and PUBMED for studies concerning the effects of PCI in NSCLC patients. We found that PCI can confer benefits include decreased incidence of BM and increased Disease-Free Survival (DFS), especially in NSCLC patients with a high risk of developing BM, but no apparent effect on Overall

Survival (OS). Toxicity is well tolerated in most of the patients with no significant impact on quality of life. The use of PCI could potentially benefit NSCLC patients, depending on the disease and patient factors.

Keywords: Non-Small Cell Lung Cancer, Brain Metastases, Prophylactic Cranial Irradiation.

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Case Report: Remarkable Response to Concurrent CDK4/6 Inhibitor and Aromatase Inhibitor with Radiotherapy on Luminal type Late Stage Breast Cancer

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Introduction: Advanced stage Luminal type breast cancer (Hormonal receptor positive, Her-2 negative) is often encountered with various complaints that incriminate the patient, as well as limited therapeutic options that can be offered to the patient.

Case Presentation: We present a 45-year-old female breast cancer patient admitted to our centre with severe dyspnoea owing to massive right lung pleural effusion, and extensive ulcer in the right breast with pain and active bleeding. Histopathology is invasive breast cancer no special type (NOS) WHO grade 3, strong ER (+), strong PR (+), Ki67 >20% and Her-2 (-). Staging is confirmed to be T4d N2 M1, with lung and liver metastasis. The patient underwent thorax-drain installation to evacuate the effusion fluid. She started to take oral CDK 4/6-inhibitor Palbociclib 125 mg OD (d1-21) together with Letrozole 2.5 mg OD. As the wound healing was not satisfactory, concurrent radiotherapy was being opted to treat the right breast for 60 Gy in 30 fractions. The response was remarkable as the wound was progressively healed with minimal side effects.

Discussion: This case illustrates a possible synergistic effect of concurrent Radiotherapy with oral CDK 4/6 inhibitors and Aromatase inhibitors. Minimal side effects and a significant response was highlighted in this case.

Keywords: breast cancer, pulmonary pleural effusion, radiotherapy, palbociclib, letrozole

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From local palliative to preoperative radiation therapy in breast cancer: implication on treatment and side effect

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Radiation therapy is one of treatment of choices in breast cancer management. Nowadays, radiation therapy mainly acts as adjuvant therapy after surgery and chemotherapy, or as palliative treatment and only in small case of pre-operative setting.

A 51 years old woman referred to us from surgical oncologist with infiltrating ductal carcinoma of right breast cancer with active tumoral bleeding. She was already given 9 cycles of neo adjuvant chemotherapy (NAC regiment), with no response. Radiation was given 25x2Gy locoregional and booster 5x2 Gy to the whole right breast for palliative purpose with good response. Two weeks after her last radiotherapy session, our surgical oncologist colleague decided that this patient became operable and did MRM 1 month later. Because of the total dose of the radiation, wound healing took at least 5 months to completely adhere.

This case illustrates the possibility of a swift change in role of radiotherapy from palliative to definitive preoperative setting in a single case, with the consequence of radiation's side effect on wound healing. A multidiscipline team meeting can provide a better scenario, so the dose of radiation can be limited and timing of the surgery can be well prepared to avoid a worse outcome of wound healing.

Keyword: Palliative, Preoperative radiation therapy, Breast Cancer, wound healing

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Utilization of Hypofractionated Radiotherapy Among Indonesian Radiation Oncologist During and After Pandemic COVID-19

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Background: The incidence of breast cancer (BC) is increasing over time. However, the availability of radiotherapy machines is minimal, especially after the COVID-19 pandemic. The use of hypofractionated radiotherapy (HFRT) may provide a solution for this

situation. We intended to evaluate the practice of HFRT for BC patients amongst the Indonesian Radiation Oncologist Society members.

Material and methods: This study uses a Google Form questionnaire distributed personally in early October 2021. Statistical analysis uses descriptive and Chi-square/Fisher tests.

Results: A twenty-nine participants filled the questionnaire. One-third of participants worked at Academic Hospital and aged 35 - 45 years old. Most of the participants had working experience of fewer than ten years. 16 (55.2 %) and 11 (37.9 %) participants preferred HFRT for WBI with or without regional nodes irradiation. 9 (31 %) and 8 (27.5 %) participants preferred HFRT for postmastectomy with or without reconstruction. In the centre with three or more radiation oncologists, HFRT was preferred for PMRT after breast reconstruction (12.5 vs. 87.5 %, $p=0.022$).

Conclusion: The utilization of HFRT in routine practice amongst Indonesian RO is still low despite proven clinical benefits. Continuing medical education about evidence-based may increase the translation of clinical trials into daily practice.

Keywords: Hypofractionated, Radiotherapy, Breast Cancer

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Conventional External Radiation Beam Boost Using Cobalt-60 for Cervical Uterine Cancer: Outcome in Stage I – II and Stage III – IV

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Introduction: External radiation and brachytherapy are therapeutic options for inoperable cervical uterine cancers. However, unavailability of brachytherapy often occurs in some radiotherapy centres, while patients are reluctant to further seek this facility in other centres. We observed clinical outcomes of such cervical

uterine cancer patients which eventually had to be treated with external radiation alone.

Material & Method: We conduct a retrospective study on cervical uterine cancer patients in Prof. Dr. Margono Soekarjo Hospital Purwokerto from January 2012 – January 2015. Patients are divided into two groups; group 1 consist of stage I – II patients and group 2 consist of stage III – IV patients. Analysis was then further conducted. The end points of this study are overall survival and local recurrence free survival.

Result: This study involved 147 patients. We used Cobalt-60 external radiation, with whole pelvic external radiation dosage of 50 Gy and external radiation beam boost dosage range from 16 – 20 Gy (with total dosage range from 66 – 70 Gy). The median follow-up period after radiotherapy was 14 months. One year and five years overall survival in group 1 were 72 % and 55 % respectively, while in group 2 were 44 % and 27 % respectively ($p = 0,003$). One year and five years local recurrence free survival in group 1 were 88 % and 54 % respectively, versus group 2, which are 67 % and 34 % respectively ($p = 0,007$).

Conclusion: Our study suggests that cervical uterine cancer patients having conventional external radiation beam boost therapy on stage I – II had better result than those of stage III – IV.

Keywords: External radiation beam boost, cervical uterine cancer, cobalt-60

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Dyspnoea Relief with Palliative Radiation: A case report

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The main treatments for ovarian cancer are surgery and chemotherapy. Radiation therapy is occasionally used to treat advanced ovarian cancer that has spread to the pelvis or to other parts of the body. It may be used after surgery or chemotherapy, or on its own as a palliative treatment.

A 68 years old female with ovarian cancer metastases to brain, and right main bronchus complain severe dyspnoe. Previous history this lady already follows thru chemotherapy and whole brain radiation. Then radiation as palliative treatment delivers local to mass on right bronchus that cause atelectasis.

After 10 fractions 3 Gy each patient admit better oxygen saturation and atelectasis controlled. While pleural effusion remains and patient plan to do effusion tapping to improve tidal volume.

This case remains us as radiation oncologist that palliative treatment setting for improve quality of life not only for Superior vena cava syndrome nor bone pain but also use to shrink a tumor or tumors that are causing the symptoms.

Keywords: Palliative, Radiation, Dyspnoea

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Validity and Reliability Test of Indonesian Version EQ-5D-5L Instruments for Cervical Cancer Patients Underwent Radiotherapy

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Background: Radiotherapy is one of the primary cancer treatments for cervical cancer. It could affect the quality of life of cancer patients. The EQ-5D-5L is an easy-to-use instrument to evaluate health-related quality of life. This study aims to perform a validity and reliability test of the instrument in the Indonesian version for cervical cancer patients who underwent radiotherapy.

Methods: All cervical cancer patients indicated or underwent radiotherapy in October 2021 in Saiful Anwar General Hospital and Lavalette Hospital, Malang, are asked to fill EQ-5D-5L questionnaire. Data from the instrument were analysed using SPSS version 25. Statistical analysis was Pearson correlation to measure validity test and Cronbach Alpha correlation test for reliability test.

Results: Forty patients participated in this study. Pearson Correlation showed $p < 0,05$ for all five assessment dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). Cronbach Alpha coefficient showed the value of 0,889.

Conclusion: Indonesian version EQ-5D-5L is valid and reliable and can measure the quality of life of cervical cancer patients who underwent radiotherapy.

Keywords: radiotherapy, cervical cancer, quality of life, EQ-5D-5L

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A Case Report: A Rare Case Dual Primary Malignancies: Mediastinal Mass and Rectal Cancer

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A 63-year-old female patient was consulted to Radiotherapy department with rectal carcinoma, the biopsy of which suggested adenocarcinoma. Patient's medical history investigation also revealed the presence of mediastinum mass, evaluated with thoracal CT-Scan and pathology anatomy which showed infiltrating Thymoma, which had been treated extensively with Thymectomy, radiation and chemotherapy. However, either the tumour persists, or it is a new primer or a metastasis from the rectal carcinoma, it is revealed in second thoracal CT-Scan that the mass in mediastinum is present. The existence of two malignancies having different histopathology at anatomically distinct sites suggests the diagnosis of dual primary malignancies involving the mediastinum and rectal masses. Seeing how rare a combination it was, prompted us to report the case.

Keyword: dual primary malignancies, infiltrating thymoma, rectal carcinoma

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Clinical Profile of Colorectal Cancer in Banda Aceh 2016-2018

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Colorectal cancer is one of the cases of cancer that often occurs and is ranked fourth cause of death in the world due to cancer. This study aims to determine the profile of colorectal cancer in Banda Aceh Regional Hospital 2016-2018 based on clinical manifestation. This research is a descriptive study with retrospective design. We observed secondary data obtained from the medical records of colorectal cancer patients in RSUDZA between the period of January 2016 to December 2018. This research uses total sampling, wherein the total number of samples that fit the criteria is taken to be the sample of the study. From this study, 105 samples of colorectal cancer patients are obtained, with the most

common features including histopathological features of adenocarcinoma (97.1%), stage IV (41.0%), rectal lation (42.9%), history of smoking (50.5%), history of combination therapy treatment (69.5%), constipation (91.4%), haematochezia (80.0%), anaemia (92.4%), and weight loss (99.0%). This shows that colorectal cancer is more common in elderly patients and most patients have already been exposed to an advanced stage, therefore it is highly recommended to conduct early detection starting from the age of 50 years and over.

Keywords: Profile, Colorectal Cancer, Aceh

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Upregulation of Serum miR-145 in Rectal Cancer Treated with Chemoradiotherapy plus Carbogen

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Background: Circulating microRNA levels are associated with treatment outcomes of rectal cancer. Carbogen enhances radiotherapy efficacy. However, the effect of carbogen on microRNA levels is unknown. Therefore, we analysed serum microRNA in rectal

cancer patients treated with concurrent chemoradiotherapy (CCRT) and carbogen.

Methods: Twenty-eight patients with rectal cancer were prospectively registered and randomly dichotomized into two groups, treated by CCRT with or without carbogen. Sera were collected pre- and post-treatment. miR-145 and miR-21 were assessed using qPCR.

Results: Serum miR-145 level significantly increased after treatment in both groups ($P=0.0052$ and 0.0001 for control and carbogen group, respectively). The post-treatment upregulation of serum miR-145 level was significant greater in carbogen group ($P=0.0027$). In contrast, no significant differences were observed for serum miR-21 level between pre- and post-treatment either in both groups or at each timepoint.

Conclusion: Carbogen may enhance miR-145 upregulation by CCRT in rectal cancer patients.

Key words: Rectal cancer, chemoradiation, Carbogen, miR-145, miR-21.

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Inflammatory Myofibroblastic Of Bladder Tumor: A Case Report

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Background: Tumors of the bladder are not always malignant but also can be benign with invasive behaviour. Inflammatory myofibroblastic tumor (IMT) of the bladder, a typically benign lesion, is known challenging not only to diagnose because it presents similarly like other malignant disease but also challenging for its therapy. Radiotherapy become a part of treatment of this rare tumour to gain a good local control

Case Presentation: We discuss a case of a 8 years old girl who presented with gross haematuria. From MRI demonstrated a large, bladder mass concerning for bladder Tumour. After a resection of this mass, pathology demonstrated an IMT. With residual tumour after resection, patient undergo radiotherapy for 25 fraction of 1,8 Gy per fraction.

Conclusion: IMT is a rare benign tumor in the urinary bladder with a presentation concerning for malignant

disease. Resection of the tumor is the standard for diagnosis. Immunohistochemistry can be useful in distinguishing IMT from other malignancies. After definitive treatment with resection, either whole tumor can be resected or leaving residual tumor, patients still have chance for recurrence. Given these findings, treatment with resection of bladder tumor in combination with radiotherapy for adjuvant treatment is adequate and reasonable for preventing local recurrences and gain good local control.

Keywords: bladder tumor, myofibroblast, radiation therapy

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Systematic Review in Big Data for Paediatric Radiation Oncology 4.0 Health Care

Mirna Primasari, Denny Handoyo, Arry Setiawan, Edwin Budiman

Childhood cancer remains one of the biggest challenges in radiation oncology. Sadly, the likelihood of surviving a diagnosis of childhood cancer depends on the country in which the child lives: in high-income countries, more than 80% of children with cancer are cured, but in many LMICs only 15-45% are cured. The extreme difference in survival percentage is very concerning. Managing and processing a high volume of data can be used to improve health care efficiency, effectiveness, enhance decision making to give the best treatment, support research and it also can be used as health care industry analytics tool in technologies needed for paediatric radiotherapy service, especially in LMIC.

In this research, we use systematic literature review (SLR) protocol, using layered filters to choose relevant journal and publications.

Apparently, computational strategies derived from big data science network hold the promise of shedding new hope on childhood cancer, especially in providing equally better paediatric radiotherapy treatment in high income and low middle-income countries. Through this review, we can recognize the characteristics needed of big data in paediatric radiotherapy domain, as well as the challenges and opportunities.

Keywords: big data, paediatric, radiation oncology

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The Quality of Life in Living Children with Brain Tumor Post Radiotherapy

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Backgrounds: Among Indonesian children, brain tumor has the third-highest incidence and the second leading cause of death.^{1,2} Radiotherapy is one of the treatment modalities in brain tumor. With prolonged survival, the late effects of radiotherapy can affect the quality of life (QoL) of children cancer survivors.³ This study was aimed to show the QoL in children with brain tumor post radiotherapy in Dr. Cipto Mangunkusumo National General Hospital.

Methods: This descriptive study consisted of 26 eligible of 29 living children with brain tumors post radiotherapy registered between January 2014 and December 2019. PedsQL™ 4.0 Generic Core Scale implemented the QoL assessment. All the questionnaires and informed consent were mailed to those 26 children. All the data were scanned and sent back digitally.

Results: We found the mean of QoL based on child self-report and parent proxy-report total score was 70.686 and 70.152, respectively. Based on the previous study of Yock, who found QoL of the normative population was 89.0 (±16.7), there were 13 children (50%) who had normative population-like QoL.

Conclusion: Half of living children with brain tumor post radiotherapy had normative population-like QoL.

Keywords: Pediatric Brain Tumor; Radiotherapy; PedsQL™

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Microsatellite Instability Status in Cervical Cancer

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Backgrounds: Microsatellite instability (MSI) is a condition in which mutations accumulate in microsatellite due to failure of DNA mismatch repair mechanisms. Microsatellite instability has been known to have a role in diagnostic features, prognostic factors, predictive factors of therapeutic response, especially in

Lynch syndrome, colorectal cancer, endometrial cancer, and gastric cancer. Although its role in various cancers is known, this feature is still not clear about how it plays a role in cervical cancer

Methods: This study was conducted by examining the presence of MSI in 29 cervical cancer tissues by immunohistochemistry. Patients received radiotherapy at the RSCM from 2018 – 2020. The recist response was assessed using an assessment based on pre and post radiotherapy imaging.

Results: we obtained 1 dMMR (positive MSI) and 28 pMMR (stable microsatellite). This study has not been able to conclude about its relationship with radiotherapy response due to limited samples with positive MSI.

Conclusion: Positive MSI found in advanced cervical cancer in Indonesia in limited numbers

Keywords: Microsatellite instability, Lynch syndrome, colorectal, endometrial, gastric cancer.

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Breast Cancer Radiotherapy: Cobalt-60 Utilization for Forward-planning Field-in-field Single-isocenter Technique

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Radiotherapy is an integral part of breast cancer management. The demand for high-quality radiotherapy in breast cancer is increasing with the development of radiotherapy devices and computation tools. Despite these remarkable improvements, some radiotherapy centres especially in developing countries are struggling to achieve the best quality possible with whatever machine owned, including the Cobalt-60 radiotherapy machine. For radiotherapy centres equipped with 100cm SSD Co-60 and a treatment planning system, it is feasible to do several modifications to get better target coverage. The team was developing a technique to create beam segmentation, increasing dose homogeneity for adjuvant treatment in post-operative breast cancer, while at the same time, trying to do simplification to maintain acceptable treatment time. The standard beam configurations for our Co-60 are tangential and supraclavicular/axilla beams which comprises of 8 to 10 fields single-isocentre with individual blocks, with a smaller number of tray exchanges between fields. The coverage of tangential and supraclavicular PTV50Gy were achieved for at least V95>95%, mean lung dose ≤ 20Gy and D5<60%, with the average treatment time was kept below 15-20 minutes. The utilization of Co-60 to treat breast cancer can be improved and easily applied in the clinic.

Keywords: forward planning, field-in-field, Cobalt-60, breast cancer.

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The Impact of Timing of Adjuvant Therapy on Survival for Newly Diagnosed Glioblastoma Multiforme: An analysis of Single Institution

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Introduction: Glioblastoma multiform is the most aggressive primary malignant brain tumor. Stupp protocol has become the standard treatment for GBM and has led to survival improvements. Due to its aggressive behavior, delayed adjuvant therapies may lead to worse survival outcome that is showed by others malignancies. However, the association between timing to initiation adjuvant therapy (TTI) in GBM remains unknown.

Aims: to analyse whether survival outcome was influenced by time to initiation adjuvant therapy

Materials and methods: From 2015 to 2019, 55 patients who had histopathologically confirmed glioblastoma multiform and treated in our department were retrospectively analysed.

Results: The median PFS and OS for entire cohort were 9 months and 13 months with the mean follow-up 12 months. Median TTI was 42 days. The median PFS for patients with TTI <4weeks, 4-6 weeks and >6 weeks were 8,7 months, 10,7 months and 9 months (p=0.3). The median OS for patients with TTI <4 weeks, 4-6 weeks and >6 weeks were 10.4 months, 16 months and 14 months (p=0.01). The difference in OS between patients with TTI within 4-6 weeks and >6 weeks was not statistically significant (p=0.08). TTI was not statistically significant affect OS in multivariate analysis.

Conclusions: Timing of adjuvant therapy following surgical resection of newly diagnosed glioblastoma multiform does not impact survival

Keywords: Glioblastoma multiform; Radiotherapy; Concurrent Chemoradiotherapy; Survival; Timing

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Association between Epstein-Barr Virus Oncoprotein (EBNA1 & LMP1) with Tumor and Nodal Extensiveness in Nasopharyngeal Cancer Patients

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Background: Nasopharyngeal cancer is an unique malignancy where the incidence is rare in most countries but endemic in Southern China and Southeast Asia, including Indonesia. The histopathology of nasopharyngeal cancer in endemic areas is usually an undifferentiated nonkeratinizing type carcinoma and is always associated with EBV infection. Various viral proteins are expressed in latent EBV infection, including EBNA1 and LMP1. These viral oncoproteins may contribute to cancer development, but they are not always be defined. Therefore, we want to investigate the role of these viral oncoproteins when it comes to the tumor and nodal extensiveness of nasopharyngeal cancer.

Methods: Tissue biopsy and blood specimens taken from nasopharyngeal cancer patients who meet the inclusion and exclusion criteria, registered from January 2020 to April 2021, were measured for EBNA1 and LMP1 using the ELISA kit examination from DRG® and MyBioSource® respectively, then correlated with primary tumor and nodal volume, which was calculated by delineation based on 3D imaging. Data analysis was performed using SPSS version 20.0. The test of two numerical variables was carried out by the Spearman correlation test.

Results: 23 subjects were included in the study, 69.5% was at stage IVA and above with the majority being males (61%). The median primary tumor and lymph

node volume were 41.4cc (13.2-128.8) and 40.1cc(1,2-633.5) respectively. Spearman correlation test found a significant relationship ($p=0.032$) between tissue LMP1 levels and tumor volume before therapy ($r=0.448$). A moderate correlation trend was seen in EBNA1 levels in tissue with blood, EBNA1 levels in tissue with primary tumor volume, EBNA1 levels in blood with lymph node volume, and LMP1 levels both in tissue and in blood with lymph node volume, although overall it was not statistically significant.

Conclusion: The higher the level of LMP1 in the tissue is correlated with the larger primary tumor size. Moderately insignificant correlation on the other variables may be caused by a small number of samples. The addition of the sample size is needed to confirm the significance of the correlation.

Keywords: EBNA1; LMP1; Nasopharyngeal Cancer; Tumor Aggressivity

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The Impact of Timing of Adjuvant Therapy on Survival for Newly Diagnosed Glioblastoma Multiforme : An analysis of Single Institution

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Conclusions: Timing of adjuvant therapy following surgical resection of newly diagnosed glioblastoma multiform does not impact survival

Keywords: Glioblastoma multiform; Radiotherapy; Concurrent Chemoradiotherapy; Survival; Timing

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c-Met and Ki-67 as Protein Biomarkers in Predicting Survival of GBM Patients: A Systematic Review

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Background: The survival of glioblastoma multiforme (GBM) patients remains poor, despite the established standard therapy paradigm. Many studies had been done to identify prognostic factors that might affect the survival of GBM patients. Clinical prognostic factors that have been identified nowadays include age, Karnofsky Performance Status, and extent of resection. However, there are also several molecular changes involved in the pathogenesis of GBM. According to a study by the Radiation Therapy Oncology Group (RTOG), c-Met and Ki-67 are protein biomarkers that significantly affect the prognosis of GBM patients.

Aim: The aim of this study was to evaluate the associations of c-Met and Ki-67 expressions to the overall survival (OS) and progression free survival (PFS) of GBM patients.

Methods: A systematic review was conducted on related articles from PubMed, EBSCOhost, Scopus, and Cochrane databases. A total of 20 articles (8 c-Met and 12 Ki-67) were included in this study.

Result: Six out of 7 c-Met articles reported that OS is significantly shorter in GBM patients with high c-Met expression. All of the 5 c-Met studies on PFS showed that overexpression of c-Met is associated with shorter PFS. Results from 8 Ki-67 articles (total 12 articles on OS) demonstrated shorter OS in GBM patients with high Ki-67 expression. Most of the Ki-67 studies (4 out of 5 studies on PFS) reported that the higher the Ki-67 expression, the worse the PFS.

Conclusion: The expressions of c-Met and Ki-67 could be used as indicators to predict OS and PFS of GBM patients, which is the higher the expression of these two proteins, the worse the survival.

Keywords: Glioblastoma multiforme, survival, prognosis

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Quality of Life of Cervical Cancer Patient After Radiation based on The EORTC QLQ-C30 dan CX24 Questionnaire

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Aims: Knowing the characteristics of quality of life and risk factors that affect advanced local cervical cancer patients after radiation

Materials and methods: The study was a cross-sectional study on 82 research subjects. Normality test using the Kolmogorov-Smirnov test and comparison of the mean using the Mann Whitney test. Results: The mean of quality of life on the global health scale is 74.49%, the functional scale is 87.39%, the general symptom scale is 39.02%, the sexual functional scale is 45.94%, and the sexual symptom scale is 42.68%.

Conclusion: The quality of life of post-radiation cervical cancer patients is good, except on the sexual function scale. Disease-related factors that were statistically significant in influencing the improvement of the quality of life were earlier stage and no

comorbidities; Good differentiation affects the quality of life, although not significantly. Treatment-related factors that were statistically significant in influencing the improvement of the quality of life were the interval between diagnosis and treatment ≤ 90 days, overall treatment time ≤ 56 days, brachytherapy technique, and chemoradiation; while the complete therapy response and no side effects affected the improvement of the quality of life, although not significantly. Socio-economic related factors that statistically affect the improvement of the quality of life are age ≤ 45 years, marital status, further education, and income above the minimum wage.

Keywords: quality of life, cervical cancer, radiation, radiotherapy