Radioterapi & Onkologi Indonesia
Journal of the Indonesian Radiation Oncology Society

Irradiation on Extramedullary Plasmacytoma of Vulva : A case report

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Article informations:
Received: Juli 2021
Accepted: January 2022

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Abstract

Plasma cell neoplasm is a clonal plasma cell malignancy resulted from B cell differentiation which characterized by its special capability in immunoglobulin secretion. The clinical presentation varies from monoclonal gammopathy to plasma cell leukemia. Only five to six percent of plasma cell neoplasms manifest as plasmacytoma.

Solitary extramedullary plasmacytoma (EMP) in the vulva region is a rare case. This study presents a recurrent case of EMP in left labia minora of the vulva in 61-years-old patients who have undergone surgery with a complete resection. Radiotherapy was given with a total dose of 50.4 Gy External Beam Radiotherapy (EBRT), followed by vaginal cylinder brachytherapy with a total dose of 15 Gy delivered in three fractions, 5 Gy per fraction. Six months after completing radiotherapy, there was no recurrence, metastasis or progression at follow-up.

Keywords: extramedullary plasmacytoma, vulva, radiotherapy

Introduction

Plasma cell neoplasms are clonal plasma cell malignancies resulted from B cell differentiation which capable of secreting immunoglobulin. Clinical presentation varies greatly from monoclonal gammopathy to plasma cell leukemia. The majority of plasma cell tumors are diagnosed as multiple myeloma (MM) which generally occurs in adulthood. Only five to six percent of plasma cell neoplasms manifest as plasmacytoma.[1]

The median age of solitary plasmacytoma including with bone involvement and extramedullary manifestation was 55 years, which incidence is higher in man, with ratio 1.7-2: 1 compared to women. The cumulative incidence of plasmacytoma is approximately 0.15 per 100,000 population.[1,2]

The predilection of EMP is commonly occur at head and neck region and through literature search in PubMed, Scopus and Cochrane there were only three reporting cases of EMP in vulva region. The definitive therapy for solitary plasmacytoma is radiotherapy. However, because of the rarity of the disease, until now there is no consensus of the standard radiation dose. Meanwhile, the role of surgery and chemotherapy are still under debate. The purpose of this case report is to emphasize its rarity and the role of radiotherapy in the management of solitary plasmacytoma which provides good outcome and excellent disease-free survival.[1,2]

Case Illustration

A 61-year-old woman with no significant past medical history was referred to radiotherapy department. Four months ago, she experienced a lump in her left vulva region and felt discomfort during sitting position. Diagnostic biopsy with immunohistochemistry reported positive result of Multiple myeloma oncogene-1 (MUM1) and CD 56, meanwhile she had a weak positive result for vimentin. Thus, the diagnosis of plasmacytoma was confirmed. Afterwards, she had total resection surgery with negative margins. However, two months after surgery, she complaint the lump in her left vulva had recurred.

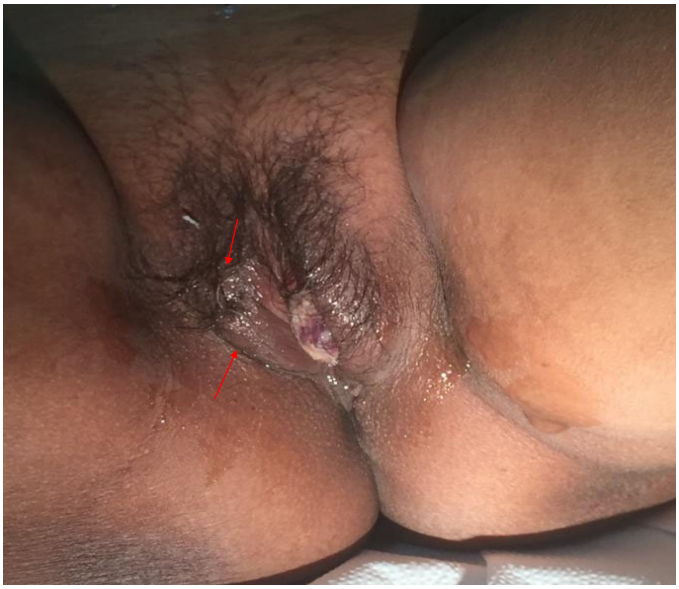

Figure 1. Mass in left vulva and labia minora (red arrow)

In the clinical examination, there was a mass in left vulva and labia minora measuring three cm in diameter without urethra and vagina involvement (**Figure 1**). There were no palpated lymph nodes in pelvic, supraclavicular, axillary, cubital fossa, inguinal and popliteal fossa region. In bone survey, there was no lytic or blastic lesion in all bones. Based on International Lymphoma Radiation Oncology Group – International Myeloma Working Group criteria (ILROG-AMWG), she was diagnosed with solitary plasmacytoma in left vulva-labia minora.

Patient received external beam radiation therapy (EBRT) with total doses 50,4 Gy in 28 fractions. She underwent radiotherapy with intensity-modulated radiation therapy (IMRT) technique in 180 cGy/ fraction over six weeks (**Figure 2**), followed by intravaginal cylinder brachytherapy with three fractions of 5 Gy to prevent recurrence because of delayed radiation boost. This patient is at disease-free state after six months of completion of the treatment (**Figure 3**).

Discussion

Solitary plasmacytoma is a plasma cell malignancy characterized by the accumulation of plasma cell neoplasms in bone and / or soft tissue without systemic involvement. The diagnosis of solitary plasmacytoma with minimal bone marrow involvement has a prognostic occurrence of progression to multiple myeloma (about 56-70%) in two to three years.[1]

Solitary plasmacytoma itself is divided into solitary bone plasmacytoma and solitary EMP. In solitary EMP, about 20-30% of plasmacytoma cases, commonly occurs in the head and neck region, especially in the nasal cavity, paranasal sinuses, and nasopharynx. However, in some cases tumor may occur in other areas such as gastrointestinal tract, skin, lymph nodes or other soft tissue. In contrast to solitary bone plasmacytoma, solitary EMP is usually localized with higher local tumor control and disease-free survival rate.[1,3]

Laboratory tests are very important investigations in cases of suspected plasma cell neoplasms. The laboratory tests include peripheral blood counts, peripheral blood smears, blood biochemical profiles; electrolytes, serum calcium, lactate dehydrogenase, B2 microglobulin and creatinine. Electrophoresis from 24-hour serum and urine followed by immunofixation for M-protein, quantitative nephelometric for immunoglobulin type and serum are additional workup examinations that needs to be done. Bone marrow aspiration or trephine biopsy is important in making a diagnosis to assess solitary plasmacytoma with minimal bone marrow involvement. The presence of clonal plasma cells of less than 10% in the bone marrow indicates a diagnosis of solitary plasmacytoma with minimal bone marrow involvement.[4]

Imaging examinations such as conventional radiography, computed tomography (CT) and magnetic resonance (MR) are important diagnostic tests in establishing the diagnosis, staging, and local extension of plasmacytoma. MR is a routine imaging examination recommended by IMWG.[3] In MR, plasmacytoma generally shows hypointense images on T1-weighted. Meanwhile, In T2-weighted and Short Tau Inversion Recovery (STIR), the mass shows a hyperintense picture. MR provides a visualization of the medullary cavity. In the new 2017 IMWG guidelines, 18-Fluoro-deoxyglucose positron emission tomography (18FDG-PET/CT) is recommended as either diagnostic or workup diagnostic tools. Studies conducted by Cavo et al, van Lammeren-Venema et al, Regelink et al and Lu YY et al reported the superiority of PET / CT in terms of the sensitivity of the detection of myeloma deposits. Limitation of PET / CT is its inability to detect small lytic lesions in bone especially in the skull region and lower sensitivity compared to MRI in detecting early bone marrow involvement.[1]

Solitary EMP has a lower risk for progression to MM around 10% to 30% in 10 years with a higher likelihood of local recurrence.[1] The goals of radiation therapy in solitary plasmacytoma include minimizing

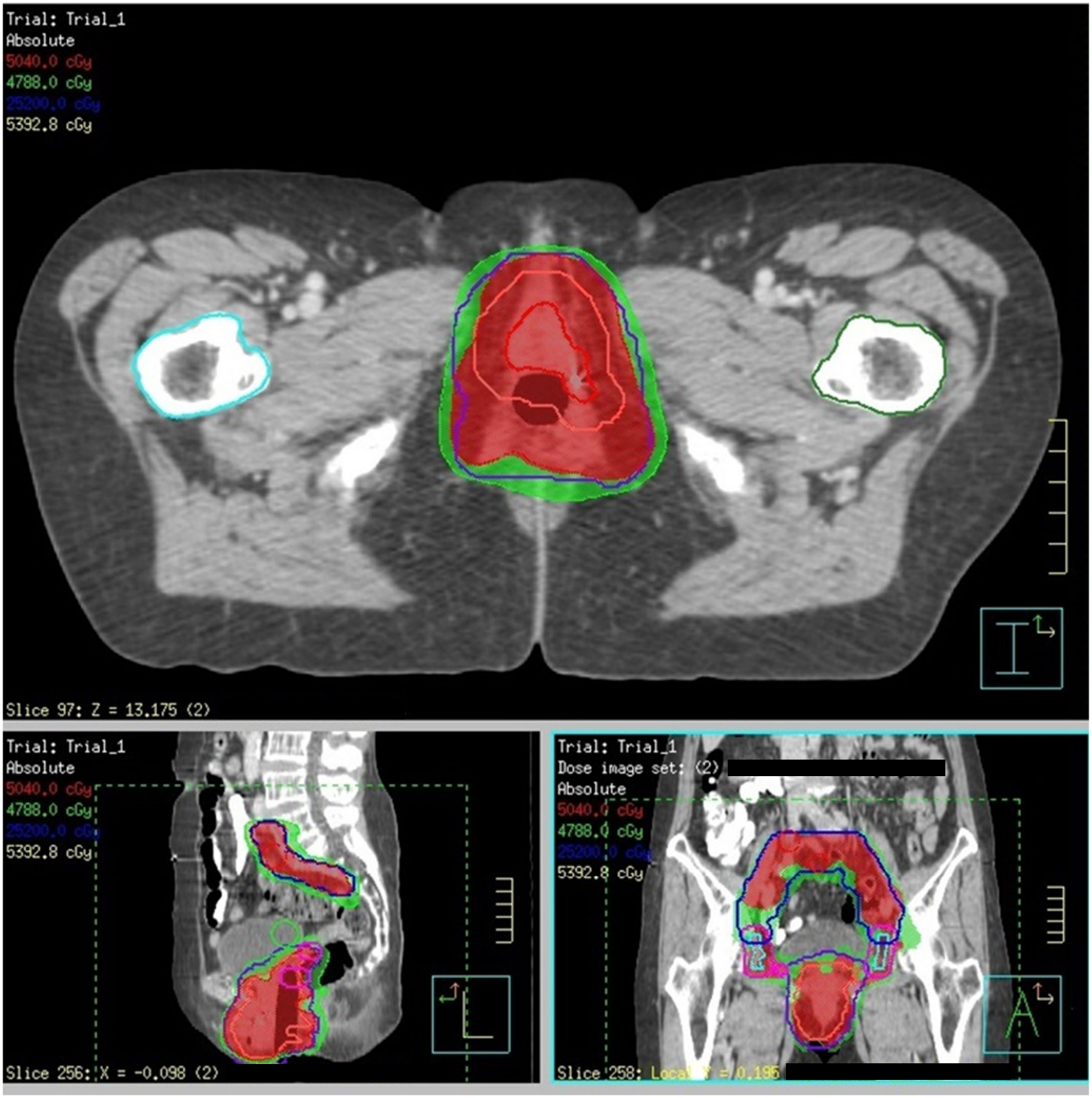

Figure 2. Dose distribution in IMRT planning

morbidity, pain control, weight-bearing bone stabilization and some cases are local tumor control.[5] Radiation therapy is the first-choice therapy in cases of solitary plasmacytoma that have not progressed to multiple myeloma. An initial study conducted by Wiazzane et al with median time to follow up of 18 months, showed a combination of radiation therapy with targeted therapy (lenalidomide or bortezomib) in solitary plasmacytoma providing benefits with a good level of safety. Four of the six patients achieve a post-treatment complete response that was assessed on PET / CT. Five of the six patients did not complain of major symptoms and only experienced with first degree acute toxicity during radiation.[1]

Solitary plasmacytoma is a radiosensitive tumor, with radiation alone, the local control rate reaches 79-91% .[1,3] In the case of lymph node (LN) involvement, radiation at the high-risk elective LN chain must be considered. In cases without LN involvement, prophylactic radiation in LN chain is still controversial. Tsang et al suggested for prophylactic radiation given the results of existing retrospective studies achieved low recurrences (less than 5%). However, consensus panelists from ILROG do not recommend prophylactic radiation in the elective LN chain without involvement of LN with evidence of MRI and / or PET-CT in cases of solitary extramedullary plasmacytoma. Only in cases of large tumors (bulky tumors), or does not

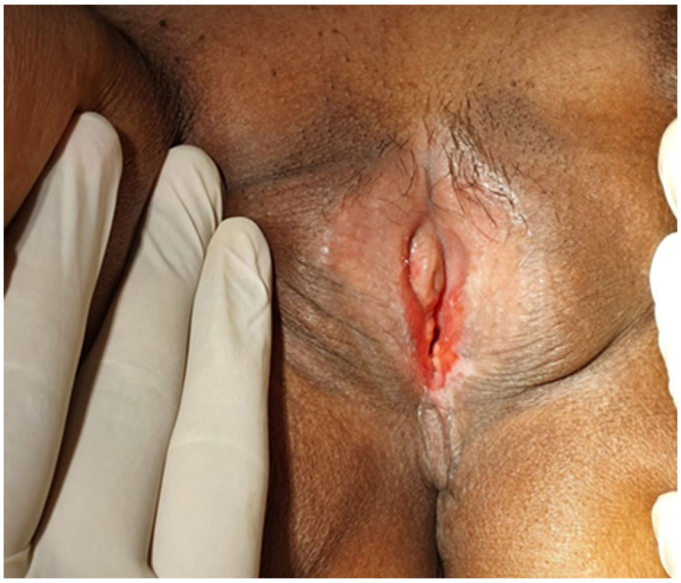

Figure 3. local vulva condition (no mass seen), six months after treatment completion

significantly increase radiation toxicity, prophylactic radiation administration in the elective LN chain can be done.[1]

The optimal dose of radiation in solitary plasmacytoma is not well known because existing case studies generally involve a small number of patients.[1] However, the therapeutic guidelines suggested by Soutar et al in 2004, suggested the administration of radiation with total doses 40 to 45 Gy.[7] Studies conducted by Mayr et al in 1990 and Liebross et al in 1998 showed that greater radiation doses (reaching 50 Gy) can be given in cases of solitary EMP that are larger than five centimeters.[1,7] Similar to the guidelines issued by the United Kingdom Myeloma Forum, NCCN also recommend the administration of a minimum dose of 40 Gy for all solitary plasmacytomas.[5]

In this case, EBRT in the inguinal LN chain was not given because the radiation toxicity received on the femoral head would be high and increase the likelihood of osteoradionecrosis. External radiation was given by including gross tumors in the vulva and labia minora areas along with iliac and obturators LNs with relatively safe radiation doses. During radiation, Grade 1 acute radiation toxicity of skin and lower gastrointestinal tract were seen. At the time of the 28th radiation fraction, there was still a tumor residue in left vulvar region measuring one cm in diameter, thus brachytherapy radiation booster was performed. In accordance with the recommendations given by ILROG-IMWG, boosters can be given up to an equivalent dose of 60 Gy.

Brachytherapy was performed at five weeks after EBRT. Delay in the administration of brachytherapy was due to medical condition of the patient. At the first brachytherapy fraction, during the gynecologic examination, no tumor mass was found in the left vulva. Booster radiation with vaginal cylinder brachytherapy was added with total dose of 15 Gy in three fractions, to prevent recurrence due to delay delivery of radiation booster.

In conclusion, solitary EMP in the vulva region is a rare case and known as a radio responsive tumor with good local control rate with radiation alone. Solitary EMP is a localized tumor with excellent local response rate and disease-free survival rate.

Conflicts of Interest

The authors affirm no conflict of interest in this study

Funding Sources

Personal fund

Acknowledgment

We would like to acknowledge everyone who has contributed in taking care of this patient.

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