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CLINICAL VIGNETTE

Radical external radiotherapy of a solitary plasmacytoma of C1

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Solitary bone plasmacytoma (SBP) is defined as a single lytic lesion due to monoclonal plasma cell (PC) infiltration, with or without soft-tissue extension [1]. It represents 2–5% of PC malignancies [2].

Bone marrow aspiration and biopsy are required to evaluate PC morphology and infiltration. Additionally to computed tomography (CT), magnetic resonance image (MRI) or fluorodeoxyglucose positron emission tomography (FDG-PET) are needed to exclude additional lesions [1, 3].

SBP of the craniocervical junction is a rare tumour. When there is vertebral instability, surgical intervention is recommended, followed by radiation therapy [4].

SBP is highly sensitive to radiation. The recommended dose guidelines for SBP are total dose of 35 to 40 Gy (1.8–2 Gy daily fractions) for SBP < 5cm, and of 40 to 50Gy for SBP ≥ 5cm [5].

55-year-old women presented in October of 2018 with aggravating neck pain for several years. She had worked as a cleaner for many years, never smoked or drunk alcohol. Medical and surgical history included hypertension, irritable bowel syndrome, asthma, depressive syndrome, and hemithyroidectomy. Medication included levothyroxine, indapamide, bisoprolol, escitalopram, and alprazolam. Her mother has type 2 diabetes, and one uncle has colon cancer. She has one healthy daughter.

Laboratory findings (complete blood cell count, and metabolic panel) and neurological exam were normal.

MRI and CT showed multiple cervical adenopathy and a single osteolytic lesion at the C1 vertebra (Fig. 1A) with 68.9 mm of transversal diameter, 31.2 mm of antero-posterior diameter, and 18.3 mm of craniocaudal diameter. No spinal cord compression was observed. FDG-PET showed diffuse hypermetabolism in cervical and oesophageal adenopathy without evidence of metastasis elsewhere.

The cervical lesion caused cranio-cervical instability, hence the decision for surgical biopsy and occipitocervical arthrodesis.

Biopsy report of C1 was positive for lambda light chains plasmacytoma. The bone marrow biopsy was negative for neoplastic involvement.

The imaging, histologic and cytogenetic study concluded for a non-high-risk solitary plasmacytoma of C1 and excluded multiple myeloma. She was then proposed for localized radical external radiotherapy.

She underwent CT simulation for treatment planning, and the images were compared to diag-

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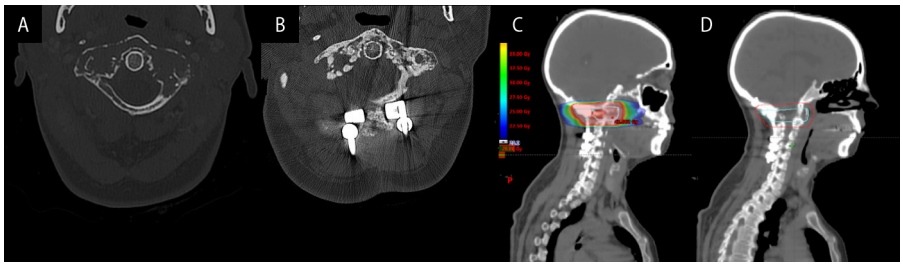

Figure 1. Solitary bone plasmacytoma (SBP) of C1 in a 55-year-old woman. **A.** Computed tomography (CT), in axial plane, showing C1 lesion predominantly involving the anterior arch and lateral masses, but also the posterior arch of this vertebra, especially on the right; **B.** CT, in axial plane, showing C1 lesion after the surgery and radiotherapy; **C.** Definitive radiation therapy, with the clinical target volume (CTV) (blue), and planning tumour volume (PTV) (red) illustrated in sagittal perspective; **D.** Isodose distribution curves, in sagittal perspective

nostic images of CT, MRI, and PET. C1 vertebra was defined as clinical target volume (CTV) on simulation CT. Planning tumour volume (PTV) was defined as 0.8 cm margin expansion from CTV, and a total dose of 40.0 Gy in 20 fractions was prescribed. Intensity-modulated radiotherapy (IMRT) plan was constructed (Fig. 1CD). A volumetric modulated arc therapy (VMAT) was chosen. The patient was treated for 28 days, with no interruptions, and experienced only dysgeusia and xerostomia throughout the treatment sessions.

Post-treatments CT showed occipital fixation, and less contrast-enhancement of the osteolytic lesion of C1 (Fig. 1B). The cervical lymph nodes were significantly smaller in diameter.

Both surgery and radiotherapy treatments caused neck rigidity. After physiotherapy, complaints were subsequently relieved, and neck mobility recovered.

The patient had poor oral health and needed several dental interventions during the treatment. Therefore, she never received bisphosphonates.

She is regularly followed to monitor disease status and treatment-related adverse events. By the end of November 2021, she was alive with stable disease.

This case shows a successful occipitocervical arthrodesis for cervical stabilization, and local disease control with radiation therapy in a middle-aged female with a solitary C1 plasmacytoma.

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