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RAPID PROGRESSION OF CLAVICULAR SOLITARY PLASMACYTOMA TO MULTIPLE MYELOMA

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ABSTRACT

Solitary plasmacytoma is a monoclonal plasma cell malignancy restricted to one tumor. Fifty percent of cases can progress to Multiple Myeloma (MM). The median time to progression is 19 months. A case about plasmacytoma advancing rapidly to MM within two months from the initial diagnosis is described. A 45-year-old male attended the Surgery Outpatient Clinic with a chief complaint of progressive swelling on the left neck for two months. Physical examination revealed a fixed, solid, 8x8 cm mass on the left supraclavicular. Fine Needle Aspiration Biopsy (FNAB) showed plasmacytoma. Surgical biopsy and immunohistochemistry confirmed the diagnosis of plasmacytoma. Ki67 index was 80%. There was no abnormality in the laboratory examination. Two months later he was admitted to the Internal Ward with anemia and kidney disorder. Serum protein electrophoresis revealed an M-spike. Bone Marrow Aspiration (BMA) showed plasma cell proliferation of 78%, which confirmed the diagnosis of MM. Solitary plasmacytoma can occur on any bone, mostly on axial bones. Solitary plasmacytoma on the clavicle is very rare, with a prevalence of 0.45% of all primary bone tumors. Diagnosis of solitary plasmacytoma relies on tissue biopsy, laboratory, radiology and bone marrow aspiration. Progression of plasmacytoma to MM can be detected from CBC and clinical chemistry results. Serum protein electrophoresis and bone marrow aspiration results confirmed the diagnosis of MM. The high proliferation index (Ki67>8%) and tumor size (>5cm) were the risk factors for the rapid progression of plasmacytoma.E arly detection of systemic symptoms is critical in the management of solitary plasmacytoma.

Key words: Solitary plasmacytoma, multiple myeloma

INTRODUCTION

Solitary plasmacytoma is a monoclonal plasma cell malignancy that consists of one lesion with no other systemic symptoms (hypercalcemia, anemia, kidney dysfunction). The incidence rate of plasmacytoma is 3-5% from all plasma cell malignancies with a higher frequency in males (65%). The age median in the onset of diagnosis is 55 years. Solitary plasmacytoma can progress to Multiple Myeloma (MM) in 50% of cases. The time median of progression into MM is 19 months.[1] A case about plasmacytoma progressing rapidly to MM within two months from the initial diagnosis is hereby described.

CASE

A 45-year-old male attended the Surgery Outpatient Clinic with a chief complaint of progressive swelling on the left neck for two months. In the beginning, the mass was the size of a marble. It was painless and no disturbance in swelling. The patient was planned for further examinations, but he did not follow the instruction. Two months later he returned with the main complaint of fatigue.

Physical examination of the patient showed a solitary solid mass, 8cm in diameter, regular borders and not mobile on the left supraclavicular (Figure 1). No systemic symptoms were observed in his visit. Kidney and liver function were normal with negative Bence Jones protein. Immunohistochemistry

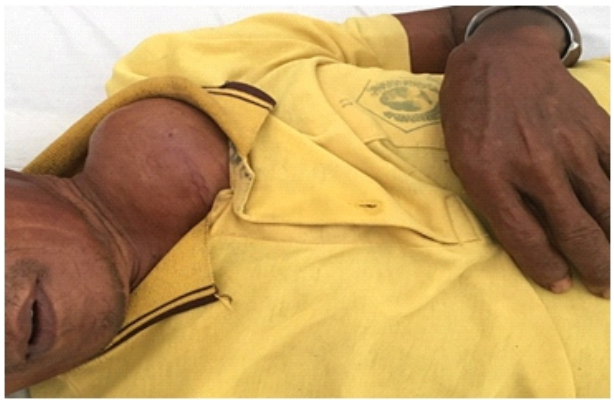

Figure 1. Solid mass on left supraclavicular

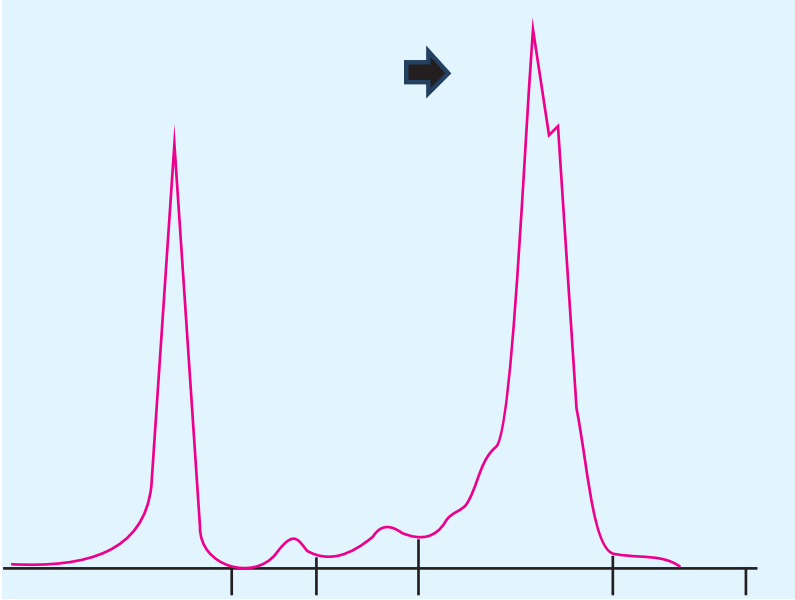

Figure 2. Serum protein electrophoresis with capillary method. Proportion of albumin (1), alpha-1 (2), alpha-2 (3), beta (4), and gamma (5) regions were 24.6%, 2.8%, 5.8%, 64.3%, 2.5% respectively. An M-spike was seen in the beta region (arrow)

Table 1. Laboratory result

Parameter	November 2017	January 2018	Reference value
Hb (g/dL)	12.4	6.2	12-16
RBC (m/µL)	4.36	2.01	4.06-5.58
Hct (%)	38	19.7	37.7-53.7
MCV (fl)	84	98	81.1-96
MCH (pg)	28.2	30.8	27.0-31.2
MCHC	32.4	31.5	31.8-35.4
RDW (%)	15.2	19.8	11.5-14.5
Plt(10^3/µL)	224	185	155-366
WBC(10^3/µL)	5.12	4.08	3.7-10.1
Diff count* (%)	2/0/1/62/28/7	4/0/3/50/33/10	-
Calcium (mg/dL)	9.3		8.5-10.1
Bence Jones protein	Negative		

Hb, hemoglobin; RBC, red blood cell count; HCT, hematocrit; MCV, mean corpuscular volume; MCH, mean corpuscular hemoglobin; MCHC, mean corpuscular hemoglobin concentration, RDW, red cell distribution width; WBC, white blood cell count; diff count, differential white blood cell count

*: Eo/Baso/Stab/SegmentedNeut/ Lympho/Mono

Table2. Bone marrow aspiration result (January 2018)

Cellularity	Hypercellular
M:E ratio	2:1
Erythropoiesis	Decreased activity, with a proportion of 6%, no dysplasia
Granulopoiesis	Decreased activity, with a proportion of 12%, no dysplasia
Thrombopoiesis	Decreased activity, megakaryocyte was difficult to find
Other cells	The proliferation of plasma cells, with a proportion of 78%
Conclusion	Bone marrow result supports the diagnosis of multiple myeloma

M: E, Myeloid to erythroid

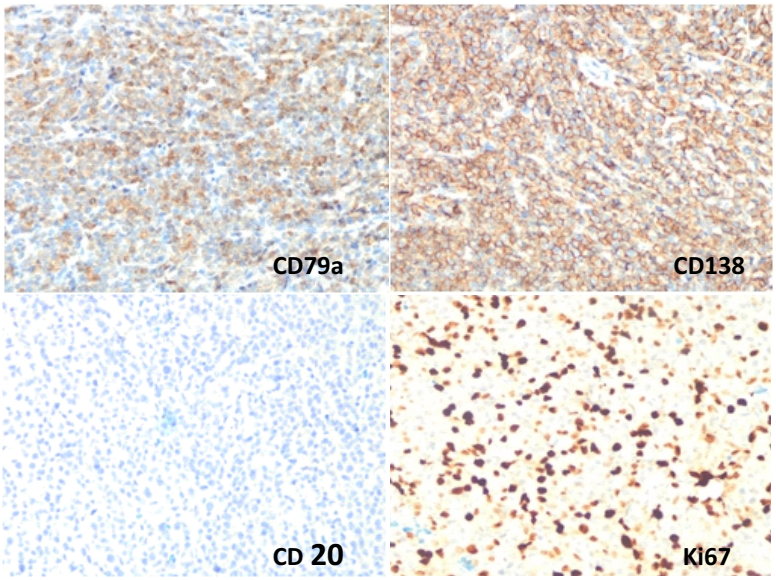

Figure 3. Immunohistochemistry examination of the plasmacytoma. Both CD79a and CD138 were positive and CD20 negative. Ki67 was found in 80% of tumor cells

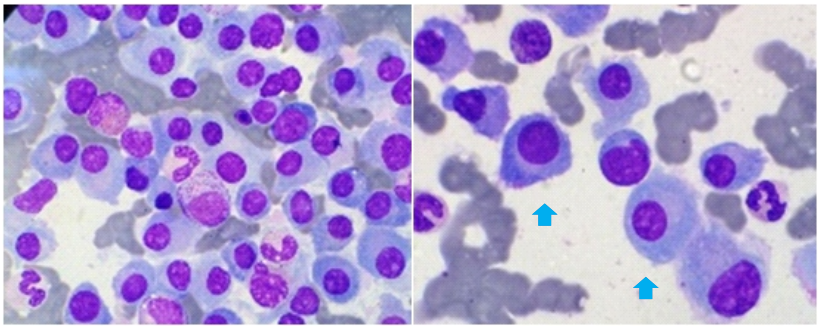

Figure 4. Bone marrow examination in January 2018. Blue arrows showed myeloma cells (Wright staining, 1,000x magnification)

examination was done in November 2017, which concluded a high-grade plasmacytoma (Figure 2). On his second visit, he developed anemia. The complete blood count examination is presented in Table 1. Bone marrow aspiration was done with the conclusion of multiple myeloma (Figure 3). The proportion of plasma cells in the bone marrow was 78% (Table 2). Serum electrophoresis protein was done with the result of a monoclonal spike in the beta region.

DISCUSSION

Solitary plasmacytoma is an accumulation of monoclonal neoplastic plasma cells without systemic involvement.[1] The plasmacytoma incidence on clavicula is infrequent, 0.45% of all primarybone tumors. Transformation into MM can be found in 50% of solitary plasmacytoma.[3] Solitary plasmacytoma has a better prognosis than multiple myeloma, thus, early and accurate diagnosis of MM is essential in solitary plasmacytoma management.

Solitary plasmacytoma diagnosis, in this case,was based on biopsy result, no anemia, hypercalcemia, kidney disorder, systemic bone lesion, and less than 10% plasma cells in the bone marrow examination.[4] Based on Durie and Salmon (DS) criteria, the patient, in this case, was categorized as DS stage 1A.[5] Yang *et al.* revealed that stage IA DS progress into MM in 65% of cases, local recurrence (12%), or spread to new solitary site (15%).[3] Progression into MM has a time median of 19 months.[6] The rapid progress of plasmacytoma into MM in just two months after the initial diagnosis is infrequent.

Immunohistochemistry result of the plasmacytomais CD3 negative. CD 3 is a T-cell marker. CD 20 is a surface protein which appears in B cells before cytoplasmic IgM production phase, and this protein disappears in the terminal differentiation stage of B cells into plasma cells.[7] CD 79a is a

transmembrane dimer protein expressed on B cells and can serve as a B cell marker.[8] Syndecan-1 (CD138) in the hematopoietic system is only found in plasma cells and can be a specific marker for plasma cells.[9] The immunohistochemistry result of this case was CD 20 negative, CD 79a positive and CD 138 positive which supported the diagnosis of plasmacytoma.

Ki 67 is anuclear protein which is related to cell proliferation and can reflect tumor burden. This protein is only expressed by actively proliferating cells.[10,11] Ki 67 result was very high in this case (80% of cell tumors). The cell showed the high activity of cell proliferation (high-grade tumor).[10]

The diagnosis of MM was based on bone marrow examination (Table 2), which result was plasma cell proportion of 78% (a myeloma defining event) with anemia symptom, bone lesion, and monoclonal protein in serum electrophoresis protein.[4] Serum electrophoresis in this patient showed a characteristic of M-spike in the beta region (Figure 2).

Yang *et al*. studied risk factors of rapid progression of solitary plasmacytoma into MM, aged more than 55 years, tumor size more than 5 cm and high-grade tumor (Ki 67 index> 8%).[3,10] The patient, in this case, had a tumor size of 8 cm with high a Ki 67 index (80%), these could be the risk factors of rapid progression of solitary plasmacytoma into MM in this case.

CONCLUSION

Solitary plasmacytoma can progress rapidly into MM, which needs to be proven by laboratory examination and bone marrow aspiration. Early evaluation of MM systemic symptoms is very important for plasmacytoma case management.

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