CONTENTS

RESEARCH

Differences of Plasma Interleukin-6 and Tumor Necrosis Factor-A Levels in Healthy People, Rifampicin Resistant and Sensitive Pulmonary Tuberculosis Patients
Wahyu Setiani Wibowo, Jusak Nugraha, Soedarsono 129 - 134

Association between Specific Enolase Serum Levels and Outcome Acute Ischemic Stroke One Month After Onset
Yuri Haiga, Darwin Amir, Yuliarni Syafrita 135 - 139

Analysis of Hemoglobin Levels And Leukocyte Count in Neonates with Hyperbilirubinemia
Dewi Suharti, Sulina Yanti Wisawa, Muthmainnah 140 - 144

Diagnostic Value of Ca-125 in Patients with Epithelial Ovarian Cancer at the Dr. Soetomo General Hospital Surabaya in 2016
Kintan P. R. Kania, Betty A. Tambunan, Willy Sandhika 145 - 149

Analysis of Vitamin D in Patients with Type 2 Diabetes Mellitus
Arfandhy Sanda, Uleng Bahrun, Ruland DN. Pakasi, Andi Makbul Aman 150 - 154

Proportion of Rhesus Blood Phenotypes at the Blood Donor Unit in Bandung City
Ivana Dewi, Nadjwa Zamalek Dalimoenthe, Anna Tjandrawati, Nida Suraya 155 - 160

Correlation of Total Lymphocyte Count with CD4 Count in HIV/TB Coinfected Patients
Herniaty Rampo, Uleng Bahrun, Mansyur Arif 161 - 164

Using Six Sigma to Evaluate Analytical Performance of Hematology Analyzer
Robiul Fuadi 165 - 169

Correlation of AA Index with Degree of Liver Fibrosis in Chronic Hepatitis B Patients
Rika Andriany, Ibrahim Abdul Samad, Mansyur Arif 170 - 173

Difference in HbA1c Level between Boronate Affinity and Ion Exchange-High Performance Liquid Chromatography Method in Diabetic Patient
Tuti Asranyi, Ellya Nasrul, Rikarni, Tutty Prihandani 174 - 179

Diagnostic Value of Neutrophil Lymphocyte Ratio to Differentiate Ischemic and Hemorrhagic Stroke
Martina Rentauli Sihombing, Liong Boy Kurniawan, Darwati Muhadi 180 - 183

D-Dimer and Fibrinogen in Patients Underwent Surgery in Malignant and Benign Ovarian Tumor
Ismail Aswin, Herman Hariman, Fauzie Sahil 184 - 190
Relationship between Specific Gravity of Cupric Sulfate and Saturation of Blood Droplets During Donor’s Hemoglobin Screening

Resna Hermawati, Solichul Hadi

191 - 193

Vancomycin-Resistant Staphylococcus aureus at the Dr. Wahidin Sudirohusodo Hospital Makassar

Fatmawaty Ahmad, Nurhayana Sennang, Benny Rusli

194 - 198

The Levels of Interleucin-6 (IL-6) and Tumor Necrosis Factor Alpha (TNF-ALFA) in Preeclampsia Patient and Normal Pregnancy

Mawardi, Ratna Akbari Ganie, Sarma N. Lumbanraja

199 - 201

Analysis of Platelet Volume Mean, Platelet Distribution Width, and Platelet Count in Hemorrhagic and Non-Hemorrhagic Stroke

Gita Medita Sunusi, Darwati Muhadi, Mansyur Arif

202 - 206

High Fluorescent Lymphocyte Count Examination in Dengue Hemorrhagic Patients with Sysmex Xn-1000 Hematology Analyzer

Budiono Raharjo, Solichul Hadi

207 - 210

Prevalence and Characteristics of Multidrug-Resistant Acinetobacter baumannii Cases at the Dr. Wahidin Sudirohusodo General Hospital in Makassar

Dewi Kartika Tungadi, Nurhayana Sennang, Benny Rusli

211 - 217

The Correlation of Anemia and Hepcidin Serum Levels in Regular Hemodialysis Patients with Chronic Hepatitis C

Wingsar Indrawanto, Adi Koesoema Aman, Alwi Thamrin

218 - 223

The Comparison between HbA1c and Glycated Albumin Level Patient with Type II Diabetes Mellitus with or without CKD

M. Rusli, Zulfikar, Santi Syafiril

224 - 227

Differentiation of T<sub>gd</sub> Lymphocyte Cells Expressing Interleukin-17 on Healthy Persons and Adult Acute Myeloid Leukemia Patients

Elvan Dwi Widyadi, Yetti Hernaningsih, Endang Retnowati, Ugroseno, Ryzky Widi Atmaja

228 - 232

LITERATURE REVIEW

Hormone Examination in Menopause

Ferdy Royland Marpaung, Trieva Verawaty Butarbutar, Sidarti Soehita

233 - 239

CASE REPORT

Chronic Myelogeneous Leukemia Transformation into Acute Lymphoblastic Leukemia

Endah Indriastuti, Arifoel Hajat

240 - 245

Rapid Progression of Clavicular Solitary Plasmacytoma to Multiple Myeloma

Hantoro Gunawan, Paulus Budiono Notopuro

246 - 249
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. Early 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. 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
Table 2. Bone marrow aspiration result (January 2018)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>November 2017</th>
<th>January 2018</th>
<th>Reference value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb (g/dL)</td>
<td>12.4</td>
<td>6.2</td>
<td>12-16</td>
</tr>
<tr>
<td>RBC (m/μL)</td>
<td>4.36</td>
<td>2.01</td>
<td>4.06-5.58</td>
</tr>
<tr>
<td>Hct (%)</td>
<td>38</td>
<td>19.7</td>
<td>37.7-53.7</td>
</tr>
<tr>
<td>MCV (fl)</td>
<td>84</td>
<td>98</td>
<td>81.1-96</td>
</tr>
<tr>
<td>MCH (pg)</td>
<td>28.2</td>
<td>30.8</td>
<td>27.0-31.2</td>
</tr>
<tr>
<td>MCHC</td>
<td>32.4</td>
<td>31.5</td>
<td>31.8-35.4</td>
</tr>
<tr>
<td>RDW (%)</td>
<td>15.2</td>
<td>19.8</td>
<td>11.5-14.5</td>
</tr>
<tr>
<td>Platelet (10^3/μL)</td>
<td>224</td>
<td>185</td>
<td>155-366</td>
</tr>
<tr>
<td>WBC(10^3/μL)</td>
<td>5.12</td>
<td>4.08</td>
<td>3.7-10.1</td>
</tr>
<tr>
<td>Diff count (%)</td>
<td>2/0/1/6/2/28/7</td>
<td>4/0/3/50/33/10</td>
<td></td>
</tr>
<tr>
<td>Calcium (mg/dL)</td>
<td>9.3</td>
<td>8.5</td>
<td>8.5-10.1</td>
</tr>
</tbody>
</table>

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

Table 1. Laboratory result

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 2. Bone marrow aspiration result (January 2018)

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

M: E, Myeloid to erythroid
Immunohistochemistry examination of the plasmacytoma. Both CD79a and CD138 were positive and CD20 negative. Ki67 was found in 80% of tumor cells.

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

DISCUSSION

Solitary plasmacytoma is an accumulation of monoclonal neoplastic plasma cells without systemic involvement. The plasmacytoma incidence on clavicle is infrequent, 0.45% of all primary bone tumors. Transformation into MM can be found in 50% of solitary plasmacytoma. 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. Based on Durie and Salmon (DS) criteria, the patient, in this case, was categorized as DS stage 1A. 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%). Progression into MM has a time median of 19 months. The rapid progress of plasmacytoma into MM in just two months after the initial diagnosis is infrequent.

Immunohistochemistry result of the plasmacytoma is 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. CD 79a is a
transmembrane dimer protein expressed on B cells and can serve as a B cell marker. Syndecan-1 (CD138) in the hematopoietic system is only found in plasma cells and can be a specific marker for plasma cells. 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. 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).

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. 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%). 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.

**REFERENCES**