Mott Cell Myeloma: Unusual Histology in a Plasma Cell Myeloma, IgA Kappa Type.

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Abstract:
Plasma Cell Myeloma is a disorder characterized by a proliferation of malignant plasma cells in the bone marrow and production of a monoclonal immunoglobulin or fragments. Myeloma plasma cells may contain condensed or crystalloid cytoplasmic IgA, receiving different names: Russell bodies, Mott cells, flume cells and Glauche-like cells. They are usually present within a diffuse background of a more recognizable myeloma plasma cells. We present the case of a 60 year old female patient with history of lower back pain for more than one year. Image studies revealed lesions in two vertebrae. Plasma Cell Myeloma was suspected clinically and an open excisional biopsy was performed. An intra-operative consultation was evaluated by 3 pathologists who could not reach a diagnosis. The tumor consisted of compact sheets of large cells with relatively small dark nuclei and abundant pink cytoplasm. It was reported as positive for tumor. In the permanent section it became apparent that the cytoplasms were studded with Russell bodies (Mott or grape cells) with a small population of typical plasma cells. The diagnosis of Plasma Cell Myeloma, Igk Kappa, was confirmed by immunostains. Predominant Mott cell morphology is an unusual presentation for a Plasma Cell Myeloma and, as in this case, could be a difficult diagnosis without immunostains.

Introduction
When there is an expansion of a clonal immunoglobulin (Ig)-secreting, heavy-chain class-switched, terminally differentiated B cell that typically secretes a single homogeneous (monoclonal) immunoglobulin called a paraprotein or M-protein (known a monoclonal gammopathy), a Plasma Cell Neoplasm results.

Among the Plasma Cell Neoplasms, the Plasma Cell Myeloma is a Bone Marrow-based multifocal plasma cell associated with an M-protein in serum and/or urine. In most cases, there is a disseminated Bone Marrow involvement, and the disease clinical spectrum ranges from an asymptomatic to aggressive forms due to deposition of abnormal immunoglobulin chains in tissues. Plasma Cell Myeloma comprises approximately 3% of malignant tumors, but causes about 20% of deaths from hematologic malignancies. The peak incidence is in the seventh decade, and the disease is slightly more frequent in males than females. It is not found in children and is rare in adults less than 30 years old.

An antigenic stimulation from infections or other chronic diseases, giving rise to benign clones of plasma cells, has been associated with an increased incidence of Plasma Cell Myeloma.

Pathologic Findings
Microscopic findings in the frozen section revealed compact sheets of large cells with relatively small dark nuclei and abundant pink cytoplasm (Image 2, insert). The slides were analyzed by three pathologists who could not reach a diagnosis and stereometric analysis was reported as positive for tumor.

In the permanent section it became apparent that the cytoplasms were studded with Russell bodies (Mott or grape cells) with a small population of typical plasma cells (Image 2). Immunohistochemical stains were then performed at the University of Puerto Rico, with positive results for CD138, CD 20, CD 79a, Lambda, IgM, and IgG. Immunohistochemical stains confirmed the diagnosis of Plasma Cell Myeloma, Igk Kappa.

Case Report
We present a 60 year old female patient with history of diverticular disease, bronchial asthma and hypothyroidism.

In 2010, the patient was evaluated at the University Hospital due to persistent low back pain present for one year. Physical examination revealed 8/10 pain in the sacral area, that increased upon ambulation. No radiologic component was associated, and no neurologic deficit was found. Initial management included chronic pain treatment, laboratory and image studies were ordered. Laboratory findings disclosed macrocytic normocytic anemia, Hgb 9.3-9.4 g/dl (RR: 12.1-14.2 g/dl); MCV; 108.5 fL (RR: 80-94.3 fL); MCH: 33.2 pg (RR: 27-35 pg); Radiologic findings included a CT Scan with an osteolytic lesion in the left sacrum extending to the sacroiliac joint, a Spinal MRI confirmed the left sacral lesion, and also demonstrated a depressed fracture in T 12, and a Lumbo-Sacral Spine X ray that showed a “punched-out” osteolytic lesion in the left sacral joint (Image 1). Plasma Cell Myeloma was suspected clinically and an open excisional biopsy was performed. During the procedure a grayish-redish soft vascular tumor was found on the left S2 area, extending to the left sacroiliac joint region. The obtained tissue was sent for frozen section and the procedure was continued with an extensive left sacral laminectomy with radical tumor resection.

Discussion
Plasma Cell Myeloma is a neoplastic proliferation of plasma cells that may present clinically three different variants: Asymptomatic (smoldering) Plasma Cell Myeloma, Non - asymptomatic Myeloma, and Plasma Cell Leukemia (PCL). In symptomatic disease, defined by the presence of end-organ damage (CRAB: hypercalcemia, renal insufficiency, anaemia, and bone lesions) in a patient with an M component and clonal bone marrow plasma cells, most patients have multiple clinical, laboratory, radiological and pathological findings, like in our case. The M protein found in 93 % cases (serum/urine) is approximately 50 % IgG and only 20 % IgA, with serum M protein being usually > 30 g/L of IgG and > 20 g/L of IgA. Microscopically there is variability in the appearance of plasma cells in different cases from very immature or poorly differentiated myeloma cells, i.e. plasmablastic, and the more extensive the marrow involvement (> 50 % replacement), the more unfavorable the prognosis.

The presence of different morphologic types of neoplastic cells in Plasma Cell Myeloma (Multiple Myeloma) has been largely described, including the unusual formation of intracellular immunoglobulin crystals within plasma cells, sometimes associated with crystal-storing histiocytosis, and the presence of Glauche-like cells (macrophage-like erythrophagocytosing intracellular immunoglobulin crystals) throughout a homogeneous background of neoplastic plasma cells. Considering that only 20% cases will have IgA, the presence of abundant Russell bodies, Mott cells or the concomitant storing lymphocytes rich (flame cells) in a biopsy due to Plasma Cell Myeloma, in a not common finding.

The initial pathologic diagnosis, in the stereometric consultation, is evidence of how difficult and challenging it is for the pathologist to give an accurate diagnosis in such an important decision making moment.

Plasma Cell Myeloma is generally an incurable disease, with significant differences in survival according to tumor mass stages, and the quantification of protein is among the used criteria for the Dalton and Salmon evaluation.

Laboratory M-lg quantification was pending at the time of our research. Nonetheless, our patient is currently being closely followed by the Oncology service, appropriate treatment has been initiated and, fortunately, she remains stable.

References

Image 1. Radiologic finding: “punched-out” osteolytic lesion in left sacral joint.

Image 2. Frozen section (insert) H&E x 200, and permanent section Immunohistochemical stain, x 1000.

Image 3. IgA immunohistochemical stain: Positive in neoplastic plasma cells. Hematoxin & Eosin. (x 1000)