

The value of fine needle aspiration cytology in the diagnosis of oral and jaw lesions in patients with plasma cell dyscrasias

Bashar H. Abdullah, M.Sc., Ph. D.⁽¹⁾

ABSTRACT

Background: Fine needle aspiration cytology (FNAC) has been found to be very useful for the diagnosis of lesions as multiple myeloma (MM) and plasmacytomas in different parts of the body. The usefulness of such procedure has not yet been verified in the oral and maxillofacial region. This study was conducted to verify the value of FNAC in the diagnosis of oral and maxillofacial lesions in patients with plasma cell dyscrasias.

Patients and methods: After clinical and radiological examination, FNAC was done by the use of 10 cc syringes with 22-23 gauge needles on 11 patients with lesions affecting the maxillofacial region. The smears stained with Leishman's stain, to be examined microscopically.

Results: Twenty eight patients were examined throughout 1.5 years period, 11 had soft tissue/or bone lesions affecting the maxillofacial region. 9 patients with MM and 2 had plasmacytoma. Of 9 patients with MM, the mandible was involved in 5 patients, 3 lesions affected the maxilla, and while in one patient the maxilla and mandible were both affected. Soft tissue lesions were seen in 6 patients. The results of FNAC showed that all lesions were due to involvement with myeloma cell infiltrates, with one exception of 2 osteolytic lesions which were due to odontogenic infection.

Conclusion: FNAC is a very useful and safe procedure to diagnose different types of lesions affecting the oral cavity in patients with plasma cell dyscrasias.

Keywords: Multiple myeloma, plasmacytoma, fine needle aspiration cytology. (*J Coll Dentistry* 2005; 17(2):41-44)

INTRODUCTION

The plasma cell dyscrasias are a group of B cell neoplasms that have in common the expansion of a single clone of immunoglobulin-secreting cells and a resultant increase in serum level of a single homogenous immunoglobulin or its fragments. The homogenous immunoglobulin identified in the blood is often referred to as a component of the plasma dyscrasias are multiple myeloma (MM) and the localized plasmacytoma, other variants are the lymphoplasmacytic lymphoma, heavy-chain-disease, primary or immunocytic-associated amyloidosis and the monoclonal gammopathy of undetermined significance. Collectively, these disorders account for about 15% of deaths from malignant white cell disease, they are most common in middle-aged and elderly persons⁽¹⁾.

MM is characterized by the neoplastic proliferation of a single clone of bone marrow derived plasma cells. MM develops mainly multifocal endosteal lesions and rarely soft tissue masses.

Plasma cells growing within the bone marrow replace the normal haemopoietic tissue and consequently expansion together with the release of different cytokines, including IL6 and IL1 by cells of tumor, or non-tumor origin may lead to the characteristic production of destructive lesions. Osteolytic bone lesions are usually the main cause of symptoms, namely pain, tenderness and numbness. Bone destruction may also cause hypercalcaemia and pathological fractures. Lesions are most common seen in vertebrae, ribs, skull and pelvis. In 70-90% of the cases, the jaw lesions seen as multiple sharply but not corticated (punched out) areas of radiolucency⁽²⁾. Extramedullary plasmacytoma (EMP) is a soft tissue malignant neoplasm composed of a monoclonal proliferation of plasma cells. The neoplastic cells display monocytic cytoplasmic immunoglobulin expression and absence of immature B cell antigen⁽³⁾.

EMP may be primary or secondary to underlying MM. Both MM and EMP are not uncommonly manifested in the jaw bones. The clinical features of such involvement include osteolytic lesions, soft tissue masses, pain, parasthesia and amyloidosis^(4,5,6).

Although the incisional biopsy is the main stay for the diagnosis of bone or soft tissue lesions, many studies proved that FNAC is a

(1) Assistant Professor, Department of Oral Dagnosis, College of Dentistry, University of Baghdad.

simple reproductive and reproducible and an accurate diagnostic procedure^(7,8,9).

The value of this procedure as a diagnostic tool to distinguish different types of lesions that could affect the maxillofacial region has not been verified. Accordingly, clinical radiological and cytological examination was conducted in this study.

PATIENTS AND METHODS

Eleven patients, 9 with MM and 2 with EMP in whom bone and/or soft tissue lesions were present in the maxillofacial region, were selected out of 28 known cases of MM, that were admitted to Baghdad Teaching Hospital, one and a half year period from 2000-Jun till Dec- 2001. The diagnosis of MM based on peripheral blood and bone marrow examination, urine and serum examination for the presence of Bence Johns proteins and serum protein electrophoresis.

Oral and maxillofacial region examination includes clinical and radiological examination, by OPG, oblique lateral and PA views. Any bony or soft tissue lesions were examined cytologically by the use of FNA to determine whether the lesion is infiltrated by myeloma cells or due to any other local condition which is not related to MM.

FNAC was done by the use of 10 cc disposable syringe, with 23-24 gauge needles. 2-4 smears were aspirated from each lesion. The smears were stained with Leishman's stain. From cytomorphological point of view, the cellular elements in the bone marrow smears which were done as a routine diagnostic procedure were compared with oral smears.

RESULTS

According to the criteria used for the diagnosis of the type of plasma cell dyscrasia, 9 patients had MM, while 2 had EMP. According to gender 4 were males, and 7 were females, with age range from 41-76 years with mean age of 58 year. Among the 9 patients with MM, the mandible was involved in 5 patients, while the maxilla in 3. In one patient both the maxilla and the mandible were involved with osteolytic lesion. Plasmacytoma was only seen in the mandible in two patients. Regarding the mode of presentation of the lesion, a maxillary palatal

mass was the only presenting feature of MM in one patient, in another 4 patients, the bone lesions were discovered on clinical and radiological examination and were not noticed by the patients. In the other 4 patients, the osteolytic lesions as well as the soft tissue lesions were part of the complaints. Apart from the lesions due to myeloma cell infiltrate, parasthesia of the lower lip was seen in 4 patients including the 2 patients with EMP. Resorption of the root of the teeth was a prominent feature being seen in 6 patients with bony lesions. The clinical features are summarized in this table (1).

Table 1: The results of FNAC (bone and soft tissue lesions)

	Clinical feature	Site	No. of cases
1.	Osteolytic bone lesions	Maxilla	4
		Mandible	7 (2 EMP)
2.	Soft tissue lesions	Maxilla	4
		Mandible	2
3.	Parasthesia	Lower lip	4 (2 EMP)
4.	Root resorption	Maxillar	3
		Mandible	5 (2 EMP)

The total number of lesions seen in the 11 patients was 17, since more than one lesion was present in some patients, cytopathological examination of the aspirates taken from the soft tissue masses revealed myeloma cell infiltrate in all the cases. While aspirates from the osteolytic bone lesions showed also infiltrate of myeloma cell except 2 cases, in whom only neutrophils were seen due to odontohemic infection (periapical abscess). Morphologically, the myeloma cells seen in the smears were of 3 types: mature which are plasma cell like; blastic type (plasmablast) and an intermediate type between these 2 extremities.

This variation in the type of cells was similar to that seen in the bone marrow aspirates. Another cytomorphological features noticed include binucleation, bizzar cells and even mitotic figures.

The technique of FNAC was proved to be safe, simple and reliable to diagnose different types of lesions in patients with plasma cell dyscrasias.

DISCUSSION

The occurrence of oral and maxillofacial lesions in patients with plasma cell dyscrasias was proved to be not uncommon complication in this study. Such complication could include soft tissue tumors, osteolytic bone lesions, parasthesia, pain, infection, resorption and mobility of the teeth and lastly amyloidosis. Apart from the last complication, all the other mentioned were observed in this study.

Osteolytic lesions of the mandible is assumed to be more common than the maxilla in MM presumably due to the higher content of marrow in the former than the latter⁽¹⁰⁾. However, in this study, the affection of the mandible and maxilla were comparable, with simultaneous involvement of the skull in 4 patients.

This study showed that both soft tissue tumors and bone lesions can be the presenting feature of MM or EMP, or can be seen during or throughout the course of the disease. Since the maxillofacial region is a common site for the occurrence of a vast number of lesions, it is essential to distinguish between the different cases of lesions which can be clinically and radiologically similar.

Biopsy is the orthodox method for the diagnosis carrying with it all the risks of infection, bleeding and delayed healing. One alternative procedure in the use of FNAC, which is proved to be, useful, accurate and cost effective procedure in the diagnosis of different oral lesions due to varieties of pathological conditions^(11,12). In MM FNAC has been proved to be useful not as a diagnostic procedure only, but as a prognostic tool, by determining the grade of myeloma cell cytologically, into low, intermediate and high grade myeloma⁽⁷⁾. In this study, FNAC has been proved to be very effective diagnostic procedure to distinguish the cause of the lesion.

The value of FNAC was proved in different body organs in MM, but studies concerning the maxillofacial lesions, is very scarce if ever existed. According to the results of this study, it is highly recommended to use FNAC to diagnose soft tissue and bone lesions in patients with plasma cell dyscrasias instead of taking a biopsy to avoid the possible complication and risk of the latter and to win the advantages of the former.

REFERENCES

- 1- Kumar V, Cotran RC, Robbins S L. White cell disorder – Multiple myeloma and related plasma cell dyscrasias. Robbins Basic Pathology 2002; Saunders-Philadelphia. P. 428.
- 2- Andrikopoulous SA, Piperi E, Paikos S. Oral and maxillofacial manifestations of malignant haemopoietic and lymphoreticular disorders – Part IIB. Haema 2003; 6(1), 48-53.
- 3- Gnepp DR. Diagnostic surgical pathology of the head and neck.. Non squamous pathology of the larynx, hypopharynx and trachea- Extramedullary plasmacytoma 2001; W.B. Saunders Company. Philadelphia. 286-287.
- 4- Shibata M, Kodonai I, Doi R, et al. Multiple myeloma presenting symptoms in the oral and maxillofacial region. Yonago Acta Medica. 2003; 46: 77-81.
- 5- Lae ME, Vencio EF, Inwards CY, et al. Myeloma of the jaw bones: a clinico-pathologic study of 33 cases. Head and Neck 2003; May. 25(5): 373-81.
- 6- Millesi W, Enislidis G, Lindner A, et al.. Solitary plasmacytoma of the mandible – a combined approach for treatment and reconstruction. Int J Oral Maxillofac Surg 1997; Aug. 26(4): 295-8.
- 7- Mukunyadzi P, Bardalas RH, Wilson CS, et al. Soft tissue masses in patients with multiple myeloma: a fine needle aspiration study of 30 patients with flowcytometry and clinical correlation. Cancer 2001; Aug. 25; 93(4): 257-62.
- 8- Fernandez-Flores A, Fortez J, Smucler A, et al. Involvement of the liver by multiple myeloma nodular lesions: a case diagnosed by fine needle aspiration and immunocytochemistry. Diagn Cytopathol 2003; Nov. 29(5): 280-2.
- 9- Pinto RG, Mandreker S, Vernekar JA. Multiple myeloma presenting as a subcutaneous nodule on the chest wall: diagnosis by fine needle aspiration. Acta Cytol 1997; Jul. Aug. 21(4): 1233-4.
- 10- Lee SH, Huang JJ, Pau WL, Chan CP. Gingival mass as the primary manifestation of multiple myeloma. Oral Surg Oral Med Oral Pathol. 1996; 82: 75-9.
- 11- Bardales RH, Baker SJ, Mukunyadzi P. Fine needle aspiration cytology findings in 21 cases of non-parotid lesions of the head. Diag Cytopathol 2000; Apr. 22(4): 211.
- 12- Chhieng DC, Cangarella JF, Cohn JM. Fine needle aspiration cytology of lymphoproliferative lesions involving the major salivary glands. Am J Clin Pathol 2000; Apr. 113 (4): 563-71.

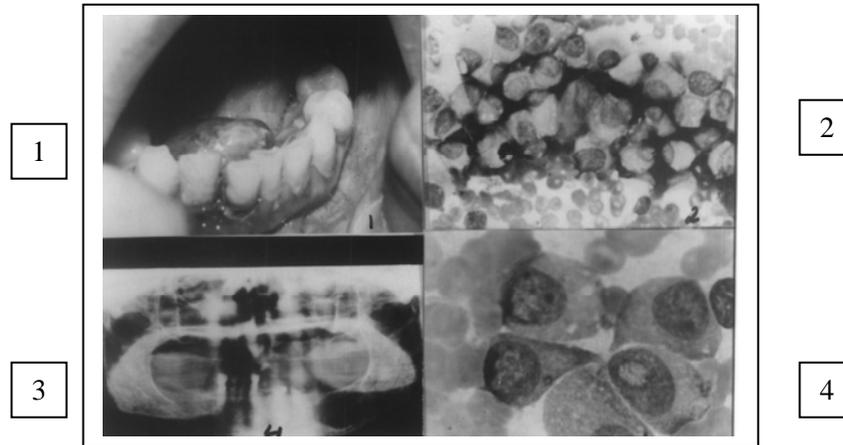


Figure A: A patient with MM, (1)Sublingual mass (2) and (3) FNA smears showing sheets of myeloma cells (x 400 and x1000 respectively). (4) X-ray showing osteolytic lesion in the body of the mandible.

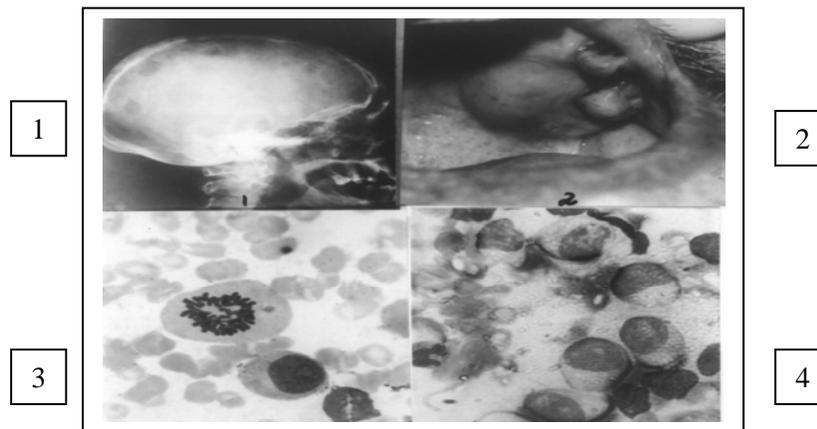


Figure B: A patient with MM, (1)Skull X-ray showing multiple osteolytic lesions (2) Palatal mass (3) and (4) FNA smears showing sheets of myeloma cells with a mitotic figure (x1000).

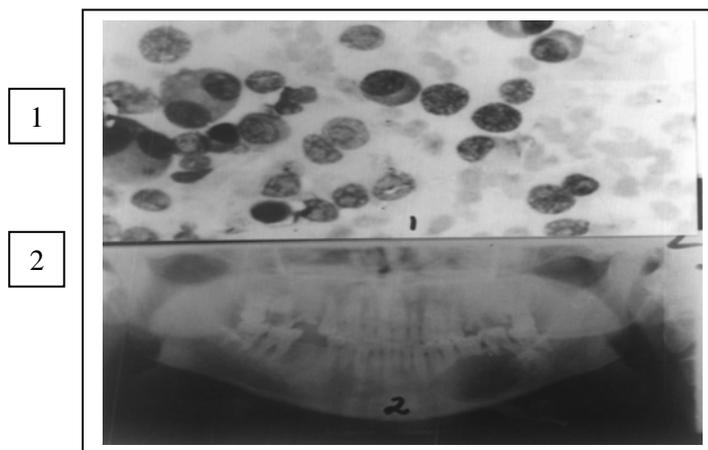


Figure C: A patient with solitary plasmacytoma, (1)FNA smear showing many myeloma cells some of them are binucleated (x 400) (2) OPG showing well demarcated radiolucency in the body of the mandible with root resorption.