Original Article

DOI: 10.17354/ijss/2016/80

Solitary Extramedullary Plasmacytoma of Nasal Cavity: An Emerging Differential Diagnosis of Nasal Masses

A Maheshwari[1], R Panigrahi[2], S Mahajan[3]

[1]Senior Resident, Department of Otorhinolaryngology, Pravara Institute of Medical Sciences, Loni, Maharashtra, India, [2]Professor, Department of Otorhinolaryngology, Hi-Tech Medical College and Hospital, Bhubaneswar, Odisha, India, [3]Post Graduate Student, Department of Ophthalmology, Pravara Institute of Medical Sciences, Loni, Maharashtra, India

Abstract

Background: This study was carried out with an aim of studying the characteristics of solitary extramedullary plasmacytoma (EMP) of the nasal cavity and reporting it as an emerging differential diagnosis of nasal masses.

Materials and Methods: A hospital record-based analysis was performed with case sheets of 197 patients who underwent surgery for nasal masses, over a period of 2-year ranging from July 2012 to June 2014. The findings pertaining to the clinical picture and treatment response of cases diagnosed as solitary EMP of nasal cavity were analyzed and compared with the available literature.

Results: There was 4 (80%) male and 1 (20%) female patient with a mean age of 54.4 years, of which 2 (40%) cases had a history of removal of a nasal mass within last 2 years. The main presenting symptoms were nasal obstruction (80%), nasal bleeding (60%), visible mass in nose (40%), and pain in nose (20%). The mean tumor size was 4.7 cm. After a median follow-up period of 24-month, 3 (60%) patients are alive and disease-free, 1 (20%) patient is alive with multiple myeloma and 1 (20%) patient died of multiple myeloma. There were no cases of loco-regional recurrence following radiotherapy until the documentation of this study.

Conclusion: Solitary EMP of the nasal cavity presents with nonspecific clinical and radiological features. It should be considered in the differential diagnosis of nasal masses. Surgery followed by radiotherapy gives promising results. However, in lieu of its propensity for local recurrence and progression to multiple myeloma, a long-term follow-up is mandatory.

Key words: Multiple myeloma, Nasal mass, Plasma cell, Plasmacytoma, Solitary extramedullary plasmacytoma

INTRODUCTION

Plasmacytomas are uncommon hematologic neoplasms, characterized by monoclonal proliferation of plasma cells that elaborate a single homogeneous immunoglobulin molecule or fragment. They originate in either bone (solitary osseous plasmacytoma) or in soft tissues (extramedullary plasmacytoma [EMP]).[1] Depending on their origin they present either as a localized disease (solitary medullary or solitary EMP) or a widespread disease as a part of a systemic process during the evolution of multiple myeloma.[2]

EMP is of special interest to an otorhinolaryngologist because of its long history and the associated diagnostic challenge. EMP represent <1% of all head and neck malignancies.[3] The post-diagnosis clinical course is unpredictable and varies among individuals.[4] Between 10% and 32% of all patients develop multiple myeloma following diagnosis, which dramatically decreases the mean survival time from 8.3 years to 20 months.[5]

The optimal management of EMP is controversial. Surgery can achieve high rates of local control in certain situations. However, radical excision is often impossible due to size or the location of the tumor.[6] Based on the well-known

Access this article online

www.ijss-sn.com

Month of Submission : 12-2015
Month of Peer Review : 01-2016
Month of Acceptance : 01-2016
Month of Publishing : 02-2016

Corresponding Author: Dr. R Panigrahi, Department of Otorhinolaryngology, Hi-Tech Medical College and Hospital, Bhubaneswar, Odisha, India. Phone: +91-94377113636. E-mail: drrajalaxmient@gmail.com

radiation sensitivity of plasma cell tumors, radiotherapy is generally, accepted as the treatment of choice for EMP, while the role of chemotherapy in these tumors is not well-defined.[7] In this article, we present the characteristics and treatment outcome of solitary EMP of the nasal cavity along with a brief literature review.

Aim of Study

1. To study the various presentations of EMP of nasal cavity
2. To establish extramedullary plasmactoma of nasal cavity as an emerging differential diagnosis of nasal masses.

MATERIALS AND METHODS

The present study is a representation of hospital record-based analysis, carried out at Hi-Tech Medical College and Hospital, Bhubaneswar, Odisha, India. The information like age, sex, side of involvement, bleeding from nose and other clinical features, nasal endoscopy findings, radiological, histopathological and laboratory findings was gathered by reviewing the stored case sheets of 197 patients of nasal masses who underwent surgery during a period of 2-year, ranging from July 2012 to June 2014.

In this study, solitary EMP was defined as a histopathologically proven single area of extramedullary tumor due to clonal plasma cells, normal bone marrow or less than 5% plasma cell infiltration in the bone marrow aspiration and a bone marrow biopsy specimen with no evidence of plasma cell nodules, normal skeletal survey, normal complete blood count, normal serum calcium level, the absence of related organ or tissue impairment such as renal dysfunction and the absence of M-protein in serum and/or urine.

OBSERVATION AND RESULTS

Among the 5 cases of solitary EMP of nasal tract, there were 4 male (80%) and 1 female (20%) patients with a mean age of 54.4 (range 43-75) years. Out of the 5 cases, 3 (60%) were new, while the remaining 2 had a history of nasal surgery for excision of some mass, within last 2 years. The main presenting symptoms were nasal obstruction (80%), nasal bleeding (60%), visible mass in nose (40%), and pain in nose (20%) (Table 1). The mean tumor size, as detected in the computed tomography scan was 4.7 (range 3.5-6) cm. The observation of the diagnostic nasal endoscopy of all these patients has been summarized in Table 2. Immunohistochemical staining was performed for kappa and lambda light chains in 3 cases. All the 5 patients (100%) were treated with gross surgical resection followed by radiotherapy. The median total radiation dose was 46 (range 40-50) Gy. After a median follow-up period of 24 (range 18-40) months, 3 (60%) patients are alive and disease-free, 1 (20%) patient is alive with multiple myeloma and 1 (20%) patient died of multiple myeloma. There were no cases of loco-regional recurrence following radiotherapy until the documentation of this study.

DISCUSSION

Plasma cells are derived from B lymphocytes and by producing specific antibodies, play an important role in the non-cellular immune mechanisms. Malignant proliferation of these antibody producing plasma cells is known as plasmacytoma.[8] There are three types of plasmacytoma described in literature - multiple myeloma, solitary plasmacytoma, and extramedullary plasmacytoma. In 1976, Wiltshaw described a staging system for EMP's.[9]

- Stage I disease is defined by the presence of a tumor at only one extramedullary site
- Stage II disease indicates involvement of regional lymph nodes
- Stage III disease involves multiple metastases – in which case, the patient by definition no longer has solitary plasmacytoma.

Schridde reported the 1st case of EMP in 1905.[10] The inter-relationship between the different neoplastic disorders of plasma cells in head and neck was described by Batasakis in 1983. Approximately 80% of EMP occurs in head and neck.[11] The most frequently affected areas in the upper aerodigestive tract are the nasal cavity or paranasal sinuses (43.8%), followed by nasopharynx (18.3%), oropharynx (17.8%), and larynx (11.1%).[3] Other sites in head and neck that have been reported include the tongue, minor salivary glands, thyroid, parotid, orbit, and temporal bone.[12] EMP is 3-4 times a more common in males than in females. It typically occurs in 6-7th decade with over 95% cases occurring in patients above 40 years of age.[13]

In the present study, the mean age of our patients was 54.4 (range 43-75) years. This finding is consistent with the observations of Miller *et al.*[14] (50.4 years), Michalaki *et al.*[6] (55 years) and Zhou *et al.*[15] (57 years). The male:female ratio observed was 4:1. Male predominance in suffering from Solitary EMP of nasal cavity has also been noticed by Kapadia *et al.*[13] (3.2:1) and Zhou *et al.*[15] (5:1).

EMP is a destructive tumor and besides the tendency for local recurrence,[13] has the ability to spread to regional lymph nodes and ability for distant metastasis with progression to multiple myeloma.[9] In the present study, there were 2 cases with a history of surgery for excision of nasal mass within last 2 years of presentation. Details of the previous surgery

Table 1: Presenting symptoms

Age (years)	Sex	Chief complaints					Case type
		Nasal obstruction	Visible mass in nose	Side involved	Nasal bleeding	Pain in nose	
60	Male	+	+	Left	-	-	New
75	Female	+	+	Right	+	+	Recurrence
43	Male	+	-	Both	-	-	New
44	Male	-	-	Right	++	-	New
50	Male	+	-	Left	++	-	Recurrence

Table 2: Examination findings

Age (years)	Sex	Tumor size (cm) in CT scan	Diagnostic nasal endoscopy		
			Mass	Attached to	Bleeds on touch
60	Male	3.5	Dark red Subepithelial	Lateral wall above anterior end of inferior turbinate	-
75	Female	4	Grayish white with surface ulceration	Middle meatus	+
43	Male	4.5	Pink polypoidal mass with granular surface blocking choana	Nasal septum	-
44	Male	6	Dark red polypoidal	Posterior end of nasal septum	+
50	Male	5.5	Pinkish white polypoidal pushing septum to opposite side	Floor	+

CT: Computed tomography

and nature of excised mass were not available. But in the light of the present diagnosis of solitary EMP of the nasal cavity, these cases can be presumed as recurrence cases as per our knowledge about their potential for locoregional recurrence.

Galieni *et al.*,[16] established five criteria for diagnosing EMP:

- Biopsy of the tissue must reveal monoclonal plasma cell histology
- Bone marrow plasma cell infiltration should not exceed 5% of all nucleated cells
- Osteolytic hone lesions and other tissue involvement must be absent
- Hypercalcemia and renal failure must be absent.
- A serum M protein concentration, if present, must be low.

Solitary EMP of nasal cavity usually has a long insidious course with the clinical features mainly being a very slow growing mass resulting in nasal obstruction and soft tissue swelling. Secondary infection and bone erosion result in pain. Uncommon features include – nasal discharge, epistaxis, and cervical lymphadenopathy.[12] The computed tomography scan and magnetic resonance imaging features of SEP of sinonasal tract are nonspecific[7] and hence a biopsy is required to make a definite diagnosis. The main presenting symptoms in the present study were nasal obstruction (80%), nasal bleeding (60%), visible mass in nose (40%), and pain in nose (20%).

Macroscopically, EMP appears as fleshy, yellow-gray to dark-red, sessile or pedunculated, polypoid or lesion with a smooth, non-ulcerated surface. On histologic examination, broadsheets of monomorphic plasma cells with variable degrees of cellular atypia and occasional areas of necrosis are seen replacing the native cellular background.[17] In the present study, the macroscopic findings as noticed during diagnostic nasal endoscopy were highly variable, as depicted in Table 2.

Microscopically, the plasma cells are set in a sparse, delicate reticular stroma that is enriched with numerous blood vessels. A monoclonal pattern of immunoperoxidase staining for kappa and lambda immunoglobulin light chains helps confirm the diagnosis and differentiates SEP from reactive plasmacytosis. There are various immunohistochemical markers in use for typing of plasma cells, which include CD38, CD79a, CD138, monoclonal cIg, endothelial membrane antigen, CD45 (weak), and CD30.[18] In the present study, immunohistochemical staining was performed for kappa and lambda light chains in 3 cases, and it yielded positive results.

The differential diagnosis includes other nasal tract malignancies, such as inverted papilloma, pleomorphic adenoma, squamous cell carcinoma, adenocarcinoma, adenocystic carcinoma, melanoma, esthesioneuroblastoma, rhabdomyosarcoma, lymphoma, sinonasal undifferentiated carcinoma, and Wegener granulomatosis.[14]

Treatment of localized EMP of head and neck is debatable. Some workers advocate radiation therapy while others advocate surgery alone. Since plasma cells are highly radiosensitive, localized primary radiotherapy has become

the treatment of choice for solitary EMP, especially for larger lesions. The British Society for Hematology recommends initial radiation treatment with 40 Gy in 20 fractions with a 2 cm margin for tumors smaller than 5 cm, and 50 Gy in 25 fractions for larger tumors.[19] Radiotherapy does not always reduce the size of the tumor, perhaps because of an abundant deposition of amyloid within the mass.[8]

Surgery is indicated - in cases of small tumor masses, where clear margins can be obtained, to remove residual tissue after radiation therapy.[18] Most clinicians recommend a combined approach (surgery + radiotherapy) for the management of sinonasal solitary EMP.[8,9] Chemotherapeutic agents such as melphalan should be considered in the cases of recurrent and disseminated disease and in cases of transformation to multiple myeloma.[19] In the present study, all the 5 patients (100%) were treated with gross surgical resection followed by radiotherapy. The median total radiation dose was 46 (range 40-50) Gy. Miller *et al*.[14] (45-50 Gy) and Michalaki *et al*.[6] (40-50 Gy) have also reported a similar radiation dose in their studies, respectively.

Acknowledging the tendency of EMP to progress into disseminated multiple myeloma, a life-long follow-up of these patients is recommended. The median survival of patients varies from 4 to 10 years. Local recurrence has been reported to occur in 8%-30% cases of EMP of upper aerodigestive tract.[9,20] In the present study, after a median follow-up period of 24 (range 18-40) months, 3 (60%) patients are alive, and disease-free, 1 (20%) patient is alive with multiple myeloma and 1 (20%) patient died of multiple myeloma. There were no cases of loco-regional recurrence following radiotherapy until the documentation of this study.

CONCLUSION

Solitary EMP of the nasal cavity presents with nonspecific clinical and radiological features. It should be considered in the differential diagnosis of nasal masses. Surgery followed by radiotherapy gives promising results. Its awareness and multidisciplinary approach is a key to appropriate management. However, in lieu of its propensity for local recurrence and progression to multiple myeloma, a long-term follow-up is mandatory.

REFERENCES

1. Batsakis JG, Medeiros JL, Luna MA, El-Naggar AK. Plasma cell dyscrasias and the head and neck. Ann Diagn Pathol 2002;6:129-40.
2. Dores GM, Landgren O, McGlynn KA, Curtis RE, Linet MS, Devesa SS. Plasmacytoma of bone, extramedullary plasmacytoma, and multiple myeloma: Incidence and survival in the United States, 1992-2004. Br J Haematol 2009;144:86-94.
3. Alexiou C, Kau RJ, Dietzfelbinger H, Kremer M, Spiess JC, Schratzenstaller B, *et al*. Extramedullary plasmacytoma: Tumor occurrence and therapeutic concepts. Cancer 1999;85:2305-14.
4. Fu YS, Perzin KH. Nonepithelial tumors of the nasal cavity, paranasal sinuses and nasopharynx. A clinicopathologic study. IX. Plasmacytomas. Cancer 1978;42:2399-406.
5. Kyle RA. Multiple myeloma: Review of 869 cases. Mayo Clin Proc 1975;50:29-40.
6. Michalaki VJ, Hall J, Henk JM, Nutting CM, Harrington KJ. Definitive radiotherapy for extramedullary plasmacytomas of the head and neck. Br J Radiol 2003;76:738-41.
7. Ching AS, Khoo JB, Chong VF. CT and MR imaging of solitary extramedullary plasmacytoma of the nasal tract. AJNR Am J Neuroradiol 2002;23:1632-6.
8. Windfuhr JP, Ott G. Extramedullary plasmacytoma manifesting as a palpable mass in the nasal cavity. Ear Nose Throat J 2002;81:110-4.
9. Wiltshaw E. The natural history of extramedullary plasmacytoma and its relation to solitary myeloma of bone and myelomatosis. Medicine (Baltimore) 1976;55:217-38.
10. Schridde H. Weitere Untersuchungen uber die kornelungen der plasmazellen. Centralbl Allg Pathol Pathol Anat 1905;16:433-5.
11. Susnerwala SS, Shanks JH, Banerjee SS, Scarffe JH, Farrington WT, Slevin NJ. Extramedullary plasmacytoma of the head and neck region: Clinicopathological correlation in 25 cases. Br J Cancer 1997;75:921-7.
12. Wax MK, Yun KJ, Omar RA. Extramedullary plasmacytomas of the head and neck. Otolaryngol Head Neck Surg 1993;109:877-85.
13. Kapadia SB, Desai U, Cheng VS. Extramedullary plasmacytoma of the head and neck. A clinicopathologic study of 20 cases. Medicine (Baltimore) 1982;61:317-29.
14. Miller FR, Lavertu P, Wanamaker JR, Bonafede J, Wood BG. Plasmacytomas of the head and neck. Otolaryngol Head Neck Surg 1998;119:614-8.
15. Zhou GY, Gao BQ, Liu YF, Zhang XL, Wang JQ. Extramedullary plasmacytoma of the head and neck: A clinicopathologic, immunohistochemistry study. Lin Chuang Er Bi Yan Hou Ke Za Zhi 2000;14:168-70.
16. Galieni P, Cavo M, Pulsoni A, Avvisati G, Bigazzi C, Neri S, *et al*. Clinical outcome of extramedullary plasmacytoma. Haematologica 2000;85:47-51.
17. Strojan P, Soba E, Lamovec J, Munda A. Extramedullary plasmacytoma: Clinical and histopathologic study. Int J Radiat Oncol Biol Phys 2002;53:692-701.
18. O'Connell FP, Pinkus JL, Pinkus GS. CD138 (syndecan-1), a plasma cell marker immunohistochemical profile in hematopoietic and nonhematopoietic neoplasms. Am J Clin Pathol 2004;121:254-63.
19. Soutar R, Lucraft H, Jackson G, Reece A, Bird J, Low E, *et al*. Guidelines on the diagnosis and management of solitary plasmacytoma of bone and solitary extramedullary plasmacytoma. Br J Haematol 2004;124:717-26.
20. Knowling MA, Harwood AR, Bergsagel DE. Comparison of extramedullary plasmacytomas with solitary and multiple plasma cell tumors of bone. J Clin Oncol 1983;1:255-62.

How to cite this article: Maheshwari A, Panigrahi R, Mahajan S. Solitary Extramedullary Plasmacytoma of Nasal Cavity: An Emerging Differential Diagnosis of Nasal Masses. Int J Sci Stud 2016;3(11):178-181.

Source of Support: Nil, **Conflict of Interest:** None declared.