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CASE REPORT

Malignant Fibrous Histiocytoma Of The Anterior Maxilla

RASTOGI S

ABSTRACT

Malignant fibrous histiocytoma (MFH) is the most common soft-tissue sarcoma, but is relatively uncommon in head and neck area. Histologically, it is difficult to distinguish this tumor from other sarcomas and carcinomas. Surgery is the most reliable treatment for MFH, but the 5-year survival rate for cases of this tumor in the head and neck is low in comparison with MFH of the extremities and trunk. Around 61 cases reported in the international literature since 1974. We present a rare case of primary MFH of the maxilla in the unusual location of maxilla in a 20-year-old female. The tumor was located in the maxillary anterior region mimicking periodontal ulcer. We have described the difficulty in diagnosing the tumor along with differential diagnosis, histopathological diagnosis, and current methods in diagnosing the tumor i.e. immunohistochemical analysis. The literature was reviewed briefly along with treatment guidelines.

Key Words: Histiocytoma, Dental, Maxilla

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Introduction

Tumors which are composed of cells differentiating as both fibroblasts and histiocytes have been designated _fibrous histiocytomas_, although only a small percentage of these lesions behave in a malignant fashion; they are called _malignant fibrous histiocytoma_, MFH.[2],[4] MFH arises predominantly in soft tissue, especially in the trunk and extremities,[5] and is one of the most common malignant tumors among the elderly, with a peak incidence in the fifth through the seventh decades of life.[6]

The term was introduced in 1963, [1] as it was believed that the tumor arose from histiocytes acting as facultative fibroblasts. Although current thinking is that the term histogenesis is related to fibroblasts themselves, the term, malignant fibrous histiocytoma has been retained for convenience, as it is descriptive of a clinico-pathological entity. The etiology of MFH is unknown. However, in long bones, there is a strong association between medullary bone infarcts and the subsequent development of osteosarcoma and malignant fibrous histiocytoma.

Malignant fibrous histiocytomas can arise from soft tissue or bone. Their occurrence is most common in the soft tissues of the abdomen and extremities, while 23% of histiocytomas occur at osseous sites. Although they can be found in the head and neck region, their occurrence is uncommon, accounting for 3–8.5% of the cases.[6],[7] The peak occurrence is in persons aged 50–70 years. A slight male predominance is observed. They can occur everywhere, owing to their mesenchymal origin.[2],[3] The most common sites of occurrence in the head and neck, are the sino-nasal tract,[8]soft tissues of the neck, craniofacial bones, and salivary glands. A literature

search showed around 61 well-documented cases of malignant fibrous histiocytoma arising at the maxilla, maxillary sinuses and zygoma.[11]-[40]

We describe an interesting case of unusual location of tumors that had been diagnosed at a late stage, in the maxilla (anterior). The present case demonstrates the typical difficulty in recognizing this tumor.

Case Report

A 20 year old female came to the Department of Oral Medicine with a complaint of a 4 month old ulcer in the upper jaw, in the front region of the gums. The patient gave a history of tooth brush trauma in the maxillary anterior gingival area, followed by an ulcer which persisted for 4 months. There was no history of vesicle or bullae prior to the ulcer formation. A provisional diagnosis of pyogenic granuloma/chronic fungal infection was given, and the patient was referred to the Department of Periodontics.

A course of antibiotics were given to the patient, and an incisional biopsy was taken, which was not conclusive. A repeat biopsy of the lesion was taken, histopathological and special stain (Reticulin positive) studies were done, which gave the diagnosis of Malignant Fibrous Histiocytoma (Storiform Type), and the patient was referred to the Dept. of Oral Surgery for further management.

On examination of the lesion –it was observed that the gingiva was red in color and inflamed with respect to the upper central incisors, with ulceration measuring 2cm in size and extending upto the middle third of the upper central incisors and the mucogingival junction [Table/Fig 1]. The lesion was severely tender on palpation, with bleeding on probing, and grade III mobility of the upper central incisors. No cervical lymph nodes were palpable. Chest radiographs and biochemical and hematological investigations showed no evidence of metastases. Axial and Coronal

CT scan of the facial bones demonstrated a minimally enhancing soft tissue density mass lesion, measuring about 3x1.5 cm, seen in the midline in the superior gingivolabial sulcus. The underlying bone of the alveolar process of the maxilla showed scalloping without frank destruction [Table/Fig 2]. A Bone scan revealed no abnormal skeleton uptake.

At operation under general anaesthesia, resection of the premaxilla was done, with extraction of the upper anterior canine and excision of the labial and palatal mucosa with 1.5 cm clearance margins. The BIPP pack was given into the defect, and was covered by a surgical obturator.

Histological examination of the surgical specimen showed a tumor composed of numerous fibroblasts, macrophages, and atypical cells, with evidence of numerous mitotic figures admixed with numerous proliferating blood vessels, with a lumen filled with RBC's. The macrophages were arranged in a storiform pattern. Certain areas showed a myxomatous degeneration [Table/Fig 3].

The surgical margins were free of tumor. The diagnosis of Malignant Fibrous Histiocytoma was confirmed after routine histology and special stains like reticulin. Postoperatively, patient recovery was uneventful. In the patient follow up, during the course of 4 months, healing was adequate, with no complaints. An interim obturator was given. The patient was explained about the postoperative chemotherapy, for which she was not willing. The patient remains free of disease, with minimal aesthetic deformity, and is tolerating her prosthesis well, 6 months postoperatively [Table/Fig 4]

Discussion

Stout[2] coined the term malignant fibrous histiocytoma on the basis of tissue culture studies made by Margaret Murray, which

purportedly showed that these pleomorphic fibroblastic tumors arose from tissue histiocytes capable of fibroblastic transformation which are called ''facultative fibroblasts''. Enzinger and Weiss subsequently defined five subtypes of MFH as follows: (1) Storiform-pleomorphic, (2) myxoid, (3) giant cell, (4) inflammatory, and (5) angiomatoid. MFH is the most common adult soft tissue sarcoma.[9]

Recently, there are controversial entities regarding tumors of fibroblastic differentiation. The ubiquitous fibroblast is capable of a wide variety of morphological and functional adaptations with respect to its body site, as well as local physiological and pathological changes. The active collagen synthesizing fibroblast is a spindle shaped or plump epithelioid cell with prominent juxtanuclear Golgi apparatus, and well developed branching rough endoplasmic reticulum (RER).[10] There is a longstanding disagreement as to whether the cell type composing MFH is a histiocyte or a fibroblast. Initially, it was proposed by Ozzello et al.[1] that the cell was ''facultative fibroblast'' (a histiocyte that could appear and function as a fibroblast). However, the majority of more recent histochemical, immunohistochemical, and ultrastructural studies of this tumor support the contention that MFH is a form of fibrosarcoma.[9],[10] Previously, the diagnosis was made on the basis of the histological appearance. Recently, distinction among these pleomorphic soft tissue tumors is best achieved by a joint immunohistochemical and ultra structural study.[10]

Malignant Fibrous Histiocytoma is the most common soft tissue sarcoma, first described by Ozzelo et al. and O'Brien and Stout[1],[2] The storiform-pleomorphic type is the most common, and is a highly cellular tumor, which can range from well differentiated to anaplastic. MFH affects individuals later in life, and occurs more often in men, with an approximate 2:1 male: female ratio.

Maxillary MFH is very rare. It was first reported in 1974.[40] The review of the literature produced 61 well-documented cases of maxillary malignant fibrous histiocytoma[11]-[40] ranging in age from 12 to 83 years, with a median age of 44.7 years. Most patients 54/61 (88.5%) showed clinical signs of primary maxillary MFH. MFH can also arise in the site of previous radiation. However, radiation induced MFH of the head and neck is exceedingly rare. A literature search showed only 7/61 cases (11.47%) of post-radiation maxilla MFH.[19][20][26][33][35] The sinonasal tract has been reported to be the commonest site (30%) of tumor involvement in the head and neck region[8] But Sabesan et al.[12] found that maxilla is the most common site (15/54 cases). This literature review of Maxilla MFH revealed that 41/61 cases (67.2%) of the lesions occurred in the maxilla[11]-[15],[17],[18],[20]-[30],[32]-[40] while only 5/61 cases (8.19%) occurred in the maxillary sinus,[14],[19],[30], and only two cases (3.2%) were reported to have occurred in the post-maxillary and alveolar ridge[16] and in the zygoma[17], respectively.

MFH is a rare tumor in the maxilla. In a review of 16 cases, Block et al.[58] noted facial swelling, pain, and loose teeth as initial presentations of MFH involving the maxilla. In our case, the patient presented with the complaint of bleeding from the gingiva and ulcer in the upper anterior gingival region, which was mistaken for Periodontal lesion.

The diagnosis of MFH usually gets delayed, because it is initially thought that other disease processes are present. In this case, it was believed that the patient had periodontal problems secondary to trauma, infection etc.

Differential Diagnosis:
The presentation of an ulcer, rapidly increasing in size, suggests an aggressive probable malignant process. If the location of the tumor is in the soft tissue, a neoplasm

894

derived from the mesenchyme would have to be considered.[41],[42] Thus, the differential diagnosis would include tumors such as fibrosarcoma, rhabdomyosarcoma, and malignant fibrous histiocytoma. In case if the tumor lies in proximity to the salivary gland tissue of both major and minor glands, the possibility of a malignant salivary gland tumor would also be considered.[41],[42] Mucoepidermoid carcinoma is the most common malignant salivary gland tumor in this age group, and although unusual, sudden rapid enlargement has been reported. Marked involvement of the maxilla was noted; therefore primary bone-derived neoplasms such as Burkitt's lymphoma, Ewing's sarcoma, or a malignant odontogenic neoplasm, would enter into the differential diagnosis as well. The findings noted on the computed tomography scan are helpful in several respects. This imaging modality is able to identify the extent of the lesion and give clues as to an epicenter. Because of the displacement of teeth and bone towards the periphery, a case could be made, that the tumor may have arisen within the confines of the alveolus. Similarly, as many odontogenic neoplasms contain cystic areas, this possibility would also be given consideration. Lack of identifiable areas of hypodensity also suggests that no appreciable vascular component is present.

A few reports have dealt with the radiographic findings of MFH.[43]-[46] Reported radiographic findings were an irregular bone margin, a moth-eaten appearance, erosion of cortex, pathological fracture, and tooth root resorption. Although, these radiographical findings are not specific to MFH, and are usually also observed in squamous cell carcinoma, it is considered as the most common malignant tumor of the head and neck. Radiographical evaluation of two cases of MFH affecting the maxillary alveolar bone, had been described by Sato et al.[15] They represented in details, the radiographical findings, which have seldom been described in previous reports. They reported the following findings: the presence of fairly

well demarcated bone destruction in the intraoral radiograph, the relatively smooth surface, uniform density, and no necrotic area of the tumor. In computed tomography images, the tumor showed clear separation from the surrounding soft tissues. Bone scintigraphs reflected the periosteal reaction to tumor invasion, and lymphoscintigraphy reflected the metastatic lymph nodes.[15] Generally, MFH of the maxilla does not differ from tumors arising in flat bones, in other parts of the skeleton. In our case, CT scan revealed a minimally enhancing soft tissue density mass lesion, measuring about 3x1.5 cm seen in the midline in the superior gingivolabial sulcus. The underlying bone of the alveolar process of the maxilla showed scalloping, without frank destruction. These findings are different from the finding described previously.[15]

Most maxilla MFH exhibited a broad range of histological patterns. Information regarding histological types was available in cases reviewed from literature. Storiform-pleomorphic was the prominent type in most cases. Our patient showed a typical storiform pattern, containing an interlaced mix of pleomorphic fibroblasts and multi-nucleated cells, arranged in fascicles, and in a myxoid pattern.

Ogura et al.[57] divided MFH into 4 categories: storiform predominance, myxoid predominance, inflammatory predominance, and pleomorphic (fibroxanthosarcomatous). This classification may be of some significance with respect to prognosis; the storiform and myxoid patterns are associated with a good prognosis because they metastasize slowly and respond well to surgical therapy. The inflammatory, and to a lesser degree, the pleomorphic variants, are more aggressive, they metastasize early, and respond less favorably to surgery alone.

Special stains can be helpful in establishing a diagnosis. The PTAH stain helped to rule out leiomyosarcoma and pleomorphic rhabdomyosarcoma, although it can be difficult to detect cross-striations and muscle

bundles in either tumor. Masson's trichrome stain showed a collagenous connective tissue background associated with malignant spindle cells. In our case, the reticulin stain was positive. Other stains include CD34, EMA, S100, and SMA, which may or may not be helpful in diagnosis.

Most of the cases reported in literature reviews, were treated surgically. In some cases, surgery was followed with post-operative radiotherapy, and in other cases, it was followed with post-operative chemotherapy, while in some cases, radiotherapy and chemotherapy had been used. Only one case was treated with chemotherapy and bonding, which resulted in a large reduction of tumor size without surgery.[12] The proportion of the local recurrence rate of MFH after initial local excision ranges between 16% and 52%.[54],[55] The presence of positive surgical margins after definitive treatment, is the single most important factor relating to local recurrence.[54] According to Barnes and Kanbour,[56] 80% of patients with local recurrences after incomplete surgical treatment, subsequently die from disease. Recurrence is related to size, depth of invasion, and microscopically positive surgical margins. In some rare cases in which MFH in the maxilla was reported, metastasized distantly to lung, skin, local, bone, pleurae, pancreas, kidneys and bone marrow[23],[33],[37] Only few cases survived without disease, while all other cases died with disease, or their condition deteriorated. In our case, the patient is free of disease 1-year postoperatively.

Conclusion

Malignant Fibrous Histiocytoma is an aggressive tumor with potential for both local recurrence and hematogenous metastatic spread. Clinicians should not overlook any kind of gingival ulcer or swelling that may not appear distinct visually, and therefore consider it to be a part of the normal anatomy, an anomaly with no significance, or treat them injudiciously. An accurate diagnosis should

be established prior to any surgical treatment using histological analysis and special stains. MFH should be treated aggressively with the main modality of treatment as surgery, followed by combined radiotherapy and chemotherapy.

[Table/Fig 1] Legend – Shows acutely inflamed labial gingival and severely tender on palpation in relation to upper central incisors.
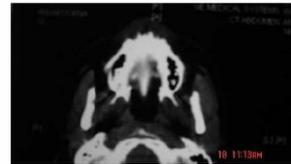
[Table/Fig 2] Axial CT scan demonstrating scalloping of the anterior margin of the alveolar process without frank destruction
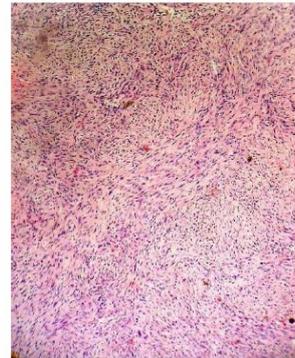
[Table/Fig 3] Photomicrograph showing the storiform arrangement of macrophages and histiocyte-like cells with myxomatous degeneration

[Table/Fig 4] Showing obturator in place six months post-operatively

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897

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