Primary orbital low-grade fibromyxoid sarcoma – A case report

Raksha Rao, Santosh G Honavar, Kaustubh Mulay[1], Vijay Anand P Reddy

An 18-year-old female presented with rapidly progressive proptosis of the left eye for one month and grade II relative afferent pupillary defect. Orbital imaging showed a well-defined homogenous extraconal mass in close relation to the lateral rectus muscle and extending up to the superior orbital fissure, associated with bony erosion. An incisional biopsy was performed, with the histopathology demonstrating stellate to spindle-shaped tumor cells (fibroblasts) embedded in a richly myxoid matrix. A diagnosis of low-grade fibromyxoid sarcoma (LGFS) was made. The patient was treated by stereotactic external beam radiotherapy. Here, we report a case of LGFS which, to the best of our knowledge, is the first at an orbital location.

Key words: Fibromyxoid, orbit, sarcoma, soft tissue tumor

Low-grade fibromyxoid sarcoma (LGFS) is a recently recognized soft tissue tumor. The condition was first reported in 1987,[1] and WHO classifies this tumor as a "malignant fibroblastic/myofibroblastic tumor." LGFS represents approximately 10% of soft tissue sarcomas and is rarely found in the head and neck region.[2] The most common locations are the proximal extremities and trunk.[2] Only 26 cases of LGFS have been reported in the head and neck region.[2-4] To the best of our knowledge, LGFS of the orbit has not been reported till date. Given the rarity of this tumor, there is no general consensus regarding its treatment. It is known to have late recurrences and distant metastasis.[1] Here, we report a case of primary orbital LGFS sarcoma that was managed by stereotactic external beam radiotherapy (EBRT).

Access this article online

Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_633_18

Department of Ocular Oncology, [1]Department of Ocular Pathology, Centre for Sight, Asoka Capitol Building, Road No 2, Banjara Hills, Hyderabad, Telangana, India

Correspondence to: Dr. Kaustubh Mulay, Ocular Pathology Service, Centre for Sight, Ashoka Capitol Building, Road No 2, Banjara Hills, Hyderabad - 500 034, Telangana, India. E-mail: kaustubh.m@gmail.com

Manuscript received: 19.04.18; Revision accepted: 01.01.19

Case Report

An 18-year-old girl presented with a history of rapidly progressive proptosis of left eye (OS) of 1 month duration. On examination, the visual acuity was 20/20, N6 both eyes (OU). Intraocular pressure was 18 mmHg OU. The anterior segment was unremarkable OU, except for relative afferent pupillary defect (RAPD) grade II OS. Funduscopically, both eyes were normal. A proptosis of 6 mm was recorded on Hertel's exophthalmometry [Fig. 1a]. Ocular motility was full and free in all directions of gaze. No orbital mass was felt on deep palpation.

Computed tomography (CT) scan of the orbit showed a well-defined, ovoid, homogenous, extraconal mass in the lateral quadrant of the left orbit, in close relation to the lateral rectus muscle. Beginning at the mid-orbit and extending up to the superior orbital fissure, it approximately measured 24 × 24 × 20 mm. There was no bony erosion [Fig. 1b]. Systemic evaluation was normal, with no evidence of any primary or

Cite this article as: Rao R, Honavar SG, Mulay K, Reddy VA. Primary orbital low-grade fibromyxoid sarcoma – A case report. Indian J Ophthalmol 2019;67:568-70.

secondary malignancy. A presumptive clinical diagnosis of primary orbital alveolar soft part sarcoma was considered.

An incision biopsy was performed by a lateral orbitotomy. Histopathology revealed alternating hypocellular, myxoid, and collagenous areas in a whorled pattern. The fibrous areas were composed of stellate- to spindle-shaped, bland appearing fibroblasts, with pale eosinophilic cytoplasm and ovoid nuclei [Fig. 1c]. Mitotic figures were absent to sparse. There was no evidence of atypia or necrosis. The tumor cells uniformly expressed CD34 and were negative for S100, desmin, epithelial membrane antigen (EMA), and smooth muscle actin (SMA). Ki67 labeling index was less than 2%. A diagnosis of LGFS was made. With the tumor being in close relation to the superior orbital fissure and its contents, radiotherapy was preferred. The

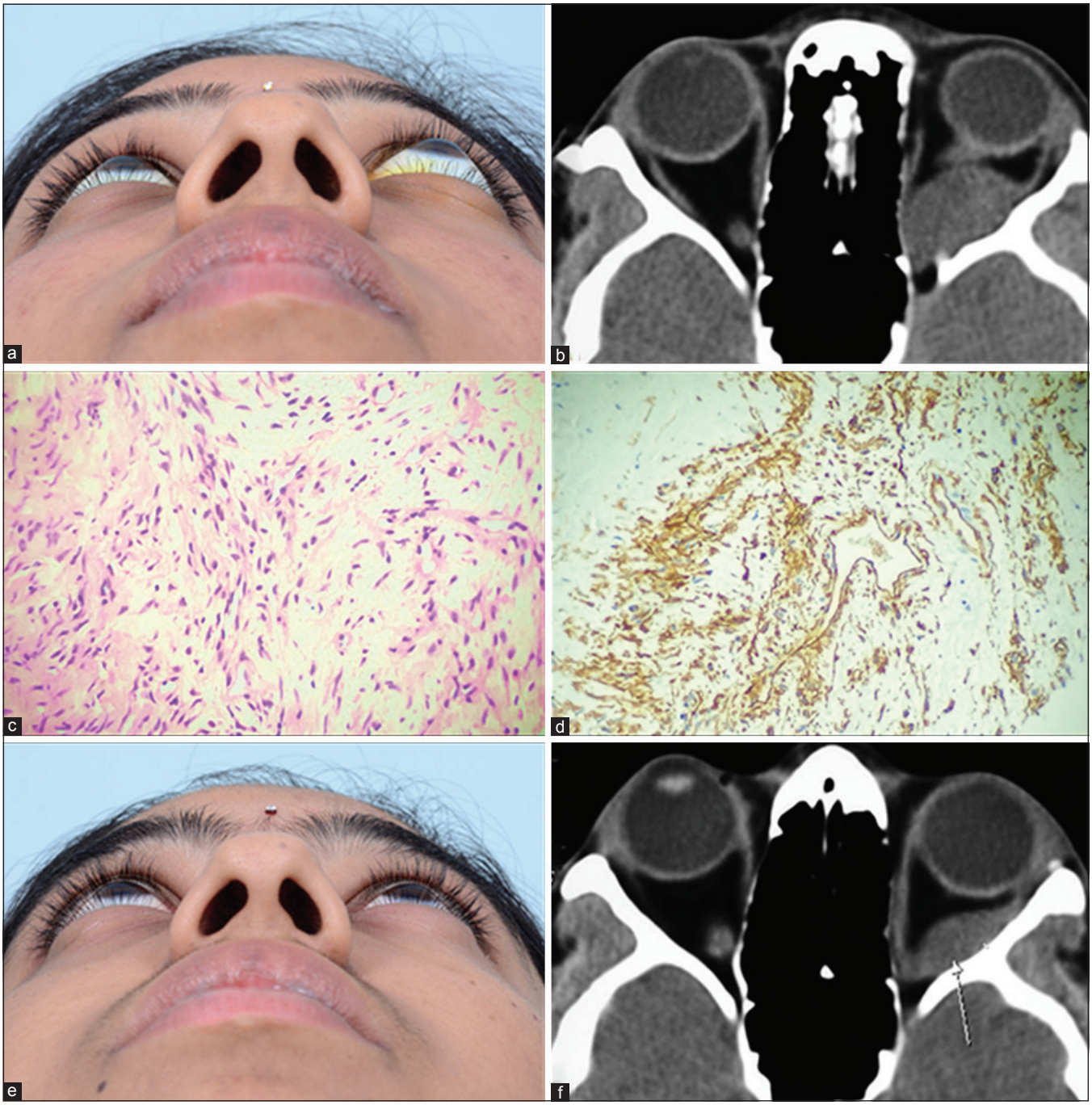

Figure 1: Primary orbital low-grade fibromyxoid sarcoma in an 18-year-old patient. (a) External photograph in a worm's-eye view illustrates a left-sided proptosis. (b) Computed tomography (CT) orbit axial section shows a well-defined homogenously hyperdense apical mass lesion along the lateral rectus extending till the superior orbital fissure. (c) Histopathologically, the tumor showed alternating hypocellular, myxoid, and collagenous areas with stellate to spindle-shaped, bland appearing cells (HE × 20). (d) On immunohistochemistry, CD34 staining was positive. At 41 months post-EBRT, (e) external photograph in a worm's-eye view shows resolution of proptosis and (f) CT orbit demonstrates residual thick scar, the size of which has remained stable for over 24 months

patient received fractionated stereotactic EBRT to the left orbit with a total dose of 5800 cGy. There was no local recurrence or systemic metastases at 41 months follow-up [Fig. 1d-f]. The visual acuity is maintained at 20/20 OS.

Discussion

Also known as Evan's tumor, LGFS is a recently recognized entity.[1] First described in 1987 by Evan as metastasizing tumors with a deceptively benign histological appearance in two cases, he described 31 additional cases of LGFS in 2011.[1] This rare neoplasm shows a male preponderance, occurring mainly in the younger age group.[1] This fibroblastic tumor typically occurs in the lower in the proximal extremities, inguinal region, and the chest wall.[2] In the head and neck regions, LGFS has been described in the soft tissues of the neck, posterior cervical spine, mandible, larynx, masseter, and the palate.[2-4]

The diagnosis of LGFS is made on histopathology.[1] The microscopic features consist of alternating fibrous and myxoid areas in swirling and whorled growth patterns, with the fibrous areas composed of bland fibroblasts.[1-3] On light microscopy, the differential diagnoses of LGFS include a number of entities characterized by spindle cell proliferations with myxoid morphologies such as low-grade myxofibrosarcoma, myxoid neurofibroma, perineurioma, myxoid solitary fibrous tumor, and fibromatosis.[5] Unlike low-grade myxofibrosarcoma, a yet another rare primary tumor of the orbit that typically has more uniform myxoid stroma, less swirling of tumor cells, and more cellular atypia, our case did not display any atypia and showed significant swirling.[3] The differentiation is essential as LGFS has a much higher recurrence and metastasis rate.[1,3] Negative S100 staining excluded a myxoid neurofibroma while EMA-negativity excluded a perineurioma. Myxoid solitary fibrous tumor may resemble LGFS but is uniformly immunoreactive for CD34.[6] In our case, CD34 was strong, but less uniform and diffuse. When the histopathology is doubtful, mucin 4 (MUC4) marker, which is highly sensitive and specific for LGFS, can be used to identify the LGFS.[2,3]

Few studies have shown that LGFS can have chromosomal translocation t(7;16)(q32-34; p11), or t(11;16)(p11;p11) producing a *FUS/CREB3L2* or *FUS/CREB3L1* fusion gene respectively.[2,3] The positivity for this gene varies considerably from 20% to 96%.[7] However, there is no significant difference in age, sex, tumor size, local recurrence, or metastasis among patients with and without the chromosomal location.[7] Hence, testing for this chromosomal translocation for diagnostic and therapeutic purpose has not proven to be useful.[7]

LGFS is known to have late local recurrences and distant metastasis.[1-3] Enneking *et al*. reported approximately 90% five-year survival rate for LGFS following surgery, with a more favorable prognosis associated with smaller tumors.[8] However, in a recent study of 33 cases with a long-term follow-up, Evans reported recurrence in 64%, metastasis in 45%, and death from disease in 42%.[1] Metastases frequently occurred in the lungs, pleura, and chest wall.[1]

The recommended treatment for LGFS of extremities and inguinal area consists of complete surgical excision of a well-circumscribed tumor with a safe margin, including the surrounding fat and muscle.[3,8] Adjuvant radiotherapy is indicated in cases where complete excision is not possible.[3] Chemotherapy may be necessary in patients with local recurrences or metastasis.[3] In our patient, although the tumor had well-defined margins, surgical resection carried risks of severe ophthalmoplegia due to its close relation with the superior orbital fissure and its contents. Hence, EBRT was preferred as the primary modality of treatment.

Conclusion

LGFS is an extremely uncommon neoplasm of the head and neck regions and this is the first reported case of orbital location. The major challenge in its management lies in making an accurate diagnosis owing to the rarity of the tumor in the orbit. Histopathology and immunohistochemistry help differentiate this malignant tumor from low-grade myxofibrosarcoma. Given the natural history of this tumor to recur or metastasize following initial treatment, serial follow-up for several years is necessary.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Evans HL. Low-grade fibromyxoid sarcoma: A clinicopathologic study of 33 cases with long-term follow-up. Am J Surg Pathol 2011;35:1450-62.
2. Cowan ML, Thompson LD, Leon ME, Bishop JA. Low-grade fibromyxoid sarcoma of the head and neck: A clinicopathologic series and review of the literature. Head Neck Pathol 2016;10:161-6.
3. Lee EJ, Hwang HJ, Byeon HK, Park HS, Choi HS. A low grade fibromyxoid sarcoma originating from the masseter muscle: A case report. J Med Case Rep 2015;9:176.
4. Soma S, Bhat S, Shetty SK. Low grade fibromyxoid sarcoma of the palate: A case report. J Clin Diagn Res 2015;9:XD01-2.
5. Vernon SE, Bejarano PA. Low-grade fibromyxoid sarcoma: A brief review. Arch Pathol Lab Med 2006;130:1358-60.
6. de Saint Aubain Somerhausen N, Rubin BP, Fletcher CD. Myxoid solitary fibrous tumor: A study of seven cases with emphasis on differential diagnosis. Mod Pathol 1999;12:463-71.
7. Maretty-Nielsen K, Baerentzen S, Keller J, Dyrop HB, Safwat A. Low-grade fibromyxoid sarcoma: Incidence, treatment strategy of metastases, and clinical significance of the FUS gene. Sarcoma 2013;2013. doi: 10.1155/2013/256280.
8. Enneking WF, Spanier SS, Goodman MA. A system for the surgical staging of musculoskeletal sarcoma. Clin Orthop Relat Res 1980;153:106-20.