PRIMARY CUTANEOUS LEIOMYOSARCOMA- 3 CASES REPORT WITH REVIEW OF LITERATURE

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ABSTRACT Leiomyosarcoma of soft tissue is relatively rare. It is typically a tumor of adults (50-60s). Most soft tissue leiomyosarcomas are located in the extremities. Primary cutaneous leiomyosarcoma of the skin is a rare tumor that accounts for 2-3% of all superficial soft tissue sarcomas. We present review of 3 cases of cutaneous leiomyosarcomas.

KEYWORDS

3 cases, cutaneous leiomyosarcoma, Myxoid change

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INTRODUCTION:

Leiomyosarcoma is a rare malignant tumor of smooth muscle origin accounting for approximately 7% of all soft tissue sarcomas1. Primary cutaneous leiomyosarcoma (PCL) is extremely rare, constituting almost 2-3% of all superficial soft tissue sarcomas2,3. This tumor is common among males between 40-60 years of age1. The preferred site of involvement is extremities1,3. The tumor can be well to poorly differentiated, nodular or diffuse[4].

The minimal criteria for malignancy are cellularity, nuclear atypia and increased mitoses4. The tumor may show numerous anaplastic nuclei and atypical giant cells with bizarre nuclei. The histological features in a well differentiated tumor may be subtle1. In tese cases distinction from a benign lesion can be problematic2,5 . Local recurrence and metastasis may be seen in cutaneous leiomyosarcoma[5].

CLINICAL DETAILS:

Case 1- A 70 year old male patient presented with a soft tissue mass at the distal end of the right thumb. He gave a past history of trauma at the site. Thumb amputation was performed as a part of treatment. The specimen received in laboratory was that of an amputated thumb with nodular soft tissue mass measuring 4x3x3cm at the distal aspect of the thumb. The cut surface of the tumor mass was grey white with whorled pattern. (Figure 1)

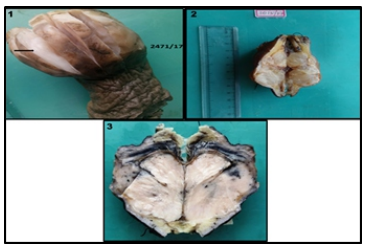

Figure 1- Gross photograph of amputated thumb showing grey white

tumor (arrow). 2- Wide excised specimen of forearm. 3- Excised specimen from the lower limb.
Microscopy- Multiple sections studied from the mass showed skin with an underlying circumscribed neoplasm in the superficial dermis (Figure A). The neoplasm was composed of intersecting fascicles and whorls of elongated spindle shaped cells with abundant eosinophilic cytoplasm, cytoplasmic vacuoles and elongated blunt ended pleomorphic vesicular nuclei with nucleoli (Figure B). The tumor showed increased mitotic activity and multinucleated giant cells. The spindle shaped cells were seen close approximation to numerous gaping blood vessels. Extensive areas of myxohyaline degeneration and areas exhibiting cartilaginous and osseous metaplasia made out (Figure C).

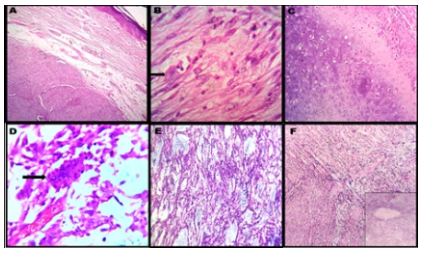

Figure A & B- Microscopic examination showing skin with underlying neoplasm composed of spindle-shaped cells with blunt-ended nucleus and mitotic figure (arrow) case 1. C- Showing osseous metaplasia case 1. D- Showing atypical multinucleated tumor giant cells (arrow) case 2. E- Showing malignant neoplasm in myxoid background (case 2). F- Showing tumor cells with areas of hyalinisation (case 3)

The tumors cells were reactive for SMA (Smooth muscle actin) and Desmin.

These features were consisting with diagnosis of cutaneous leiomyosarcoma with myxoid change. The surgical margins were intact. Patient was further referred to oncology centre.

Case 2- A 65 year female presented with swelling over left forearm. The laboratory received a wide local excision specimen measuring 9x3.5x3cm comprising skin along with nodular soft tissue mass. The soft tissue mass was measuring 4x3cm with intact overlying skin. The cut surface through the mass was glistening and multinodular. (Figure 2)

Microscopy: Multiple sections studied through the tumor mass showed skin with underlying malignant neoplasm composed of intersecting fascicles and whorls of spindle shaped cells separated b abundant myxoid matrix. The individual tumor cells had highly pleomorphic and hyperchromatic nuclei with moderate amount of eosinophilic cytoplasm. At places, tumor cells exhibited epithelioid morphology with perivascular condensation of tumor cells. Numerous giant cells along with increased mitotic activity and areas of hyalinization were also noted (Figure D and E). All the surgical margins were free of tumor.

Immunohistochemistry showed diffuse strong positivity for SMA (Smooth muscle actin) in the tumor cells. However, the cells were negative for Desmin.

These features were consisting of diagnosis of cutaneous myxoid leiomyosarcoma.

Case 3- A 50 year female presented with swelling of right lower limb. The laboratory received skin covered soft tissue mass measuring 8x5.5x3.5cm. Skin over the mass was ulcerated. The mass was measuring 7x4.5x3cm. Cut surface of the mass was grey white in discoloration.(Figure 3)

Microscopy – sections studied through the mass showed skin with underlying malignant neoplasm composed of spindle shaped tumor cells arranged in intersecting fascicles and whorls pattern. The tumor shows increased mitotic activity. Areas of hyalinization and ischemic necrosis also seen (Figure E).
Immunohistochemistry showed strong diffuse positivity for SMA (Smooth muscle actin). However, the cells were negative for Desmin.

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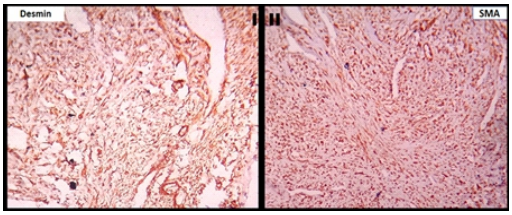

Figure I & II- Microphotograph showing immunohistochemical marker SMA and Desmin positivity in tumor.

Table 1 Clinical features of 3 cases diagnosed as cutaneous leiomyosarcoma

Numerical order	Sex	Age (years)	Location	Solitary/ multiple	Pain	Diagnosis
1	Male	70	Thumb	Solitary	+	PCLM
2	Female	65	Forearm	Solitary	+	PCLM
3	Female	50	Lower limb	Solitary	+	PCLM

PCLM : Primary cutaneous leiomyosarcoma

DISCUSSSION:
Primary cutaneous leiomyosarcoma (PCL) is a rare soft tissue tumor and it accounts for about 2-3% of all superficial soft tissue sarcomas1,2. This tumor affects males more than females and occurs mostly between 40-60 years of age1. The tumor exhibits a predilection for the lower extremities (50-70%)3. The upper extremities and trunk are less frequently involved5 unusual sites involving the face, penis, breast, orbit and external auditory canal also be reported6. Of the three cases of CLMS in the present study one involved lower extremities while the remaining two involved upper extremities namely thumb and forearm.

Predisposing factors for CLMS involve traumatic scars, radiotherapy and leiomyomas7. One out of three cases in the present series gave past history of physical trauma.

CLMS are divided into superficial dermal and deep subcutaneous types. The dermal type is thought to arise from the arrectorpilli muscle and subcutaneous type from the smooth muscle of the vessels[2].

CLMS presents as firm dermal solitary nodule measuring 1-3cm which can be painful, pruritic or paresthetic4. All three cases in the present study had an average diameter of 5cms.There may be multiple nodules evolving, located in hypodermis, in relation to muscles of origin. Overlying skin is normal or has a red colour. Rarely, it may ulcerate. The pattern of growth may be nodular or diffuse 8. Out of three cases in the present series, the mass which presented on the lower extremities showed overlying ulcerated skin.

Clinically CLMS can be missed for lipoma, dermatofibroma, dermatofibrosarcoma or neurofibroma[9].

Histologically, leiomyosarcomas are composed of a highly cellular proliferation organised in fascicles of spindle-shaped cells with irregular arrangement of cell bundles. Cells have a stretched and round ended nucleus giving a cigar appearance. The well Mitotic figures are seen all over the lesion8. Criteria for malignancy include the presence of mitoses of at least one per 10 high power fields, high cellularity, significant nuclear atypia and tumor giant cells9. According to the study of Kaddu et al.10, nodular tumors show high cellularity, prominent nuclear atypia, high mitosis and necrosis. Other features include extensive hyalinisation, myxoid change of variable extent, numerous osteoclastic giant cells and variably prominent admixed inflammatory cells including lymphocytes and xanthomatous cells11. Out of three cases in the present series two showed myxoid change of variable extent. One case of CLMS of thumb also showed osseous and cartilaginous metaplasia which has not been described so far in the literature.

Immunohistochemical studies help in the diagnosis, especially of

poorly differentiated cases of CLMS. They are positive for smooth muscle actin, Desmin and Vimentin6. SMA is considered as most sensitive marker as it indicates smooth muscle differentiation12 and has been described in some studies to be 100% positive13,14. Of the three cases of CLMS in the present study, all showed strong positivity for SMA (Smooth muscle actin). Desmin was positive in one case and negative in the rest two.

Several factors correlate with the prognosis of CLMS. These include tumor size, mitotic rate, presence / absence of necrosis and intra-tumoral vascular invasion15,16. 50-60% of the cases recur after excision17. The survival rate for tumor smaller than 2 cm was 95%, while in tumors that exceeds 5cm, survival drops to 30% [18].

Different authors have quotes different rates for metastasis19,20. In 30-60% of patients diagnosed with subcutaneous leiomyosarcoma and 5% of patients with cutaneous LMS, the disease complicated with metastasis21. Lung is the most frequently affected organ.

Treatment of cutaneous leiomyosarcoma is wide resection with free lateral margins measuring between 3-5 cm including subcutaneous tissue reaching the fascia7. In our cases complete excision of the tumor with free surgical margins were done. CLMS are known by their resistance to both radio and chemotherapy20.

CONCLUSION:

Cutaneous leiomyosarcomas are rare tumors and myxoid variants are very uncommon. Metaplastic osseous and chondroid areas are uncommon in PCL. An extensive histopathological examination, along with a proper immunohistochemical panel is mandatory for definitive diagnosis especially in myxoid leiomyosarcomas to differentiate from other myxoid sarcomas. Wide surgical resection is crucial to minimize the recurrence risk especially when poor prognostic factors are involved.

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