

Clear Cell Sarcoma: A Rare Aggressive Tumor with Potential Diagnostic Challenge

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Abstract

Clear cell sarcoma (CCS) is an exceedingly rare tumor of young adults with melanocytic differentiation. The exact incidence is largely unknown, although occasional case series mention CCS comprising less than 1% of all soft tissue sarcoma. CCS is a deep-seated tumor, typically involving tendons and aponeuroses. It has a predilection for lower extremities, particularly around the foot and ankle region, accounting for nearly 40% of cases. A primary dermal origin is rarer. We report a case of primary cutaneous CCS of 42 year old female located on the left popliteal fossa. Complete excision led to relief of symptoms

Keywords: Clear cell Sarcoma, Tumor, CCS

Introduction

Clear cell sarcoma (CCS) is a rare tumor of adults with melanocytic differentiation [1,2]. The exact incidence is largely unknown, although occasional case series mention CCS comprising less than 1% of all soft tissue sarcoma [3]. CCS is a deep-seated tumor, typically involving tendons and aponeuroses. It has a predilection for lower extremities, particularly around the foot and ankle region, accounting for nearly 40% of cases [1,3]. A primary dermal origin is rarer. The histological picture is dominated by nests of uniform polygonal to fusiform eosinophilic or clear cells with vesicular nuclei and prominent nucleoli delineated by fibrous septa. The immunohistochemically and ultrastructural evidence of definite melanocytic differentiation led it to be also designated malignant melanoma of soft parts. A characteristic cytogenetic abnormality $t(12;22)(q13;q12)$ can be detected in 70-90% cases of CCS [4-6]. The histological similarity and the immunohistochemically overlap pose a protean challenge in diagnosing and distinguishing cutaneous CCS from the more common primary (or metastatic) malignant melanoma (MM) [4,7]. We

report a case of primary cutaneous CCS of 42 year old female located on the left popliteal fossa.

Case report

A 42 year old lady presented to the OPD with a midline swelling over her left popliteal fossa. She was apparently all right 4 years back when she noticed the swelling over the popliteal region. Initially it was the size of an almond, soft in consistency which gradually progressed to a firm mass of the size of an lemon. Since the last 4 months she started developing pain over her leg and foot along with tingling sensation. Pain was sudden in onset, gradually progressive and continuous in nature. Pain was dull aching with no aggravating or relieving factors.

Local examination

On inspection 6x4 cm swelling present in left knee popliteal fossa. Skin over swelling was normal, no skin discoloration, sinus fistula, visible pulsation or dilated veins. On palpation no local rise of temperature, swelling is – tender, firm in consistency, non-mobile, not adherent to skin, adherent to underlying structures, non-pulsatile and non-fluctuant.

Investigations

X-ray showed no bony involvement. USG was suggestive of AV malformation / Hemangioma in left popliteal fossa. MRI was suggestive of 6x3.6 cm well defined ovoid lesion arising from the tibial nerve in the popliteal fossa consistent with a Peripheral nerve sheath tumor s/o Schwannoma. (Figure.-1)

Surgery

Surgical excision of the swelling involved extensive dissection over the popliteal region was done. The swelling was 6x5x4cms. It engulfed the neural bundles at the junction of the tibial nerve, common peroneal nerve, the sural nerve, the muscular branches to both the heads of the gastrocnemius. Complete enucleation of the swelling was done. The surgery was uneventful with unexpected tumor features. Then patient has been sent to higher centre for chemotherapy and radiotherapy after immunohistochemistry report.

Histopathological study

Microscopy study shows tumor composed of polygonal to spindle shaped cells which are arranged in lobular pattern. Hyalinised stromal fragments, tumor cells are pleomorphic nucleoli, prominent nucleoli, eosinophilic cytoplasm, areas of lipomatous differentiation. ? Malignant soft tissue sarcoma. Immunohistochemistry report shows the tumor cells express s-100 protein, HMB 4S & Metan A. They are

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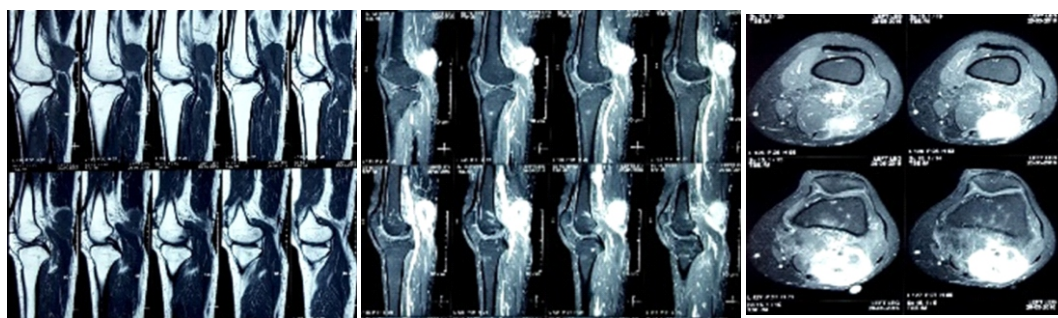


Figure 1: MRI was suggestive of 6x3.6 cm well defined ovoid lesion arising from the tibial nerve in the popliteal fossa s/o Schwannoma



Figure 2: The Swelling was 6x5x4cms. It engulfed the neural bundles at the junction of the tibial nerve, common peroneal nerve, the sural nerve, the muscular branches to both the heads of the gastrocnemius. Complete enucleation of the mass was done

immunonegative for SMA, desmin & CD34. Study suggestive of clear cell sarcoma.

Follow up

A two years follow up, patient doesn't have any complaint of recurrence. The limb have full range of motion without any abnormality.

Discussion

Dr. Franz Enzinger is credited with the first description of this unique sarcoma in 1965 and coined the term CCS of tendons and aponeuroses [8]. In his subsequent paper coauthored with Chung in 1983, the author duo documented the melanocytic phenotype of the tumor and proposed the term malignant melanoma of soft parts over the purely descriptive term of CCS [9]. Adolescents and young adults comprise the most common age group affected with no particular gender bias [1,8]. It commonly occurs in the deep soft tissues, juxtaposed to tendons, fascia or aponeuroses and mostly present as a slow-growing and frequently painful (30-60%) soft tissue mass. Although foot and ankle are the most frequently involved sites, rare cases presenting in the kidney, trunk, penis, gastrointestinal tract, head, and neck have been reported. A primary dermal location is extremely rare

with few isolated case reports and only series of 12 cases by Hantschke et al, reported till date [4]. Most tumors are relatively small, ranging from 0.4 cm up to 14.5 cm in greatest dimension [1]. Histologically, CCS classically displays compact nests and fascicles of uniform to minimally pleomorphic tumor cells delineated by dense fibrous septa. The neoplastic cells are polygonal or spindle-shaped with abundant clear or pale eosinophilic cytoplasm and a centrally-located round to ovoid vesicular nuclei with prominent nucleoli. Mitotic activity is generally low, and scattered wreath-like multinucleated giant cells are encountered in 50% of cases [1,4,5]. The tumor cells are immunopositive for the common melanocytic markers, namely HMB-45, microphthalmia transcription factor (MITF), S-100 protein, and Melan-A in 90%, 71%, 64% and 43% cases, respectively. Ultrastructurally melanosomes are usually detected. [1] A reciprocal translocation t (12;22) (q13;q12) resulting in a EWSR1/ATF1 chimeric transcript, identifiable in 70-90% cases, is considered the cytogenetic hallmark of CCS [1-6]. MM, primary or metastatic, with its histological, immunohistochemical and ultrastructural overlap constitutes the most

important diagnostic mimic of cutaneous CCS [1,4]. However, Hantschke et al, outlined several reliable histologic criteria for the accurate distinction between CCS and MM [4]. CCS is most often characterized by hyalinized sclerotic and reticulated stroma with fascicles of uniform population of tumor cells encased by delicate fibrous septa, a pattern that is seldom observed in MM. Moreover, CCS does not display any pagetoid spread of atypical melanocytes and commonly features tumor giant cells with characteristic wreath of multiple peripherally-placed nuclei. Ultimately, the t (12;22) (q13;q12) translocation observed in most cases of CCS has not yet been identified in MM [1,4]. The other differential diagnosis of CCS located in the extremity include

paraganglioma-like dermal melanocytic tumor, clear cell myelomonocytic tumor, malignant peripheral nerve sheath tumor, and synovial sarcoma, especially the monophasic type. A careful histological evaluation coupled with immunohistochemically demonstration of melanocytic differentiation in CCS usually establishes the diagnosis [1]. CCS is an aggressive tumor with propensity for recurrences, early metastases and therefore, poor overall survival [1,3]. Adverse prognostic factors include tumor size more than 5 cm, and presence of microscopic tumor necrosis [1,4]. Surgery, involving a wide excision of the tumor with sentinel lymph node biopsy, constitutes the mainstay of treatment with chemotherapy and radiotherapy showing no proven beneficial effect [1,2].

Conclusions

Clear Cell Sarcoma is a rare tumor which can be misdiagnosed with nerve sheath tumor – Schwannoma, Hemangioma, Malignant soft tissue sarcoma by clinical and radiological and histopathological presentation. It can be diagnosed only by immunohistochemically.

References

1. Dim DC, Cooley LD, Miranda RN. Clear cell sarcoma of tendons and aponeuroses: A review. *Arch Pathol Lab Med*. 2007;131:152–6.
2. Deenik W, Mooi WJ, Rutgers EJ, Peterse JL, Hart AA, Kroon BB. Clear cell sarcoma (malignant melanoma) of soft parts: A clinicopathological study of 30 cases. *Cancer*. 1999;86:969–75.
3. Kazakos CJ, Galanis VG, Giatromanolaki A, Verettas DA, Sivridis E. Clear cell sarcoma of the scapula. A case report and review of literature. *World J SurgOncol*. 2006;4:48–53. [PMC free article]
4. Hantschke M, Mentzel T, Rutten A, Palmedo G, Calonje E, Lazar AJ, et al. Cutaneous clear cell sarcoma: A clinicopathological, immunohistochemical, and molecular analysis of 12 cases emphasizing its distinction from dermal melanoma. *Am J SurgPathol*. 2010;34:216–22.
5. Hisaoka M, Ishida T, Kuo TT, Matsuyama A, Imamura T, Nishida K, et al. Clear cell sarcoma of soft tissue: A clinicopathological, immunohistochemical, and molecular analysis of 33 cases. *Am J SurgPathol*. 2008;32:452–60.
6. Patel RM, Downs-Kelly E, Weiss SW, Folpe AL, Tubbs RR, Tuthill RJ, et al. Dual-color, break-apart fluorescence in situ hybridization for EWS gene rearrangement distinguishes clear cell sarcoma of soft tissue from malignant melanoma. *Mod Pathol*. 2005;18:1585–90.
7. Rodriguez-Martin M, Saez-Rodriguez M, Esquivel B, Gonzalez RS, Cabrera AN, Herrera AM. Clear cell sarcoma: A case mimicking primary cutaneous malignant melanoma. *Indian J Dermatol*. 2009;54:168–72.
8. Enzinger FM. Clear cell sarcoma of tendons and aponeuroses: An analysis of 21 cases. *Cancer*. 1965;18:1163–74.
9. Chung EB, Enzinger FM. Malignant melanoma of soft parts. A reassessment of clear cell sarcoma. *Am J SurgPathol*. 1983;7:405–13.

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