Myeloid Sarcoma Experience from Tertiary Care Centre of Western India

Shah Kajal , Doctor Chinmay , Panchal Harsha and Patel Apurva
Department of Medical Oncology and Pediatric Oncology, Gujarat Cancer Research Institute, India.

Abstract & Background

Extramedullary primitive myeloid masses of hematolymphoid malignancy are a rare neoplasm that is difficult to diagnose and treat. Myeloid sarcomas (MSs) can occur in isolation, or with acute myeloid leukemia (AML), myeloproliferativeneoplasm (MPN), myelodysplastic syndrome (MDS) or chronic myeloid leukemia (CML) [1]. MS can affect 2.5–9.1% of patients with acute myeloid leukaemia (AML). Isolated MS is a rare condition that affects only 2 out of every million adults [2]. Isolated MS can occur at any age from pediatric to elderly patients.The common sites of MS diagnosis are lymph nodes, orbit, bone, testes, gastrointestinal tract, and peritoneum [3]. The European Society for Hematology classified a variety of extramedullary manifestations of myeloid neoplasms:(1) MS with concurrent AML; (2) extramedullary relapse of AML, including inthe post bone marrow transplant setting; (3) blast phase/transformation of a myeloproliferative neoplasm or chronic myelomonocyticleukemia; and (4) isolated MS, which occurs in association with a normal bone marrow biopsy and blood film, and in the absence of any history of myeloid neoplasia [1]. MS may express myeloid or myelomonocytic markers such as CD13, CD33, myeloperoxidase (MPO), CD14, CD64, CD68, CD117, CD34, lysozyme, CD43, CD163, etc. [1]. The median survival of MS patients is 12.8 months and patients classified in to groups according survival good (OS >30 months: reproductive and digestive systems), intermediate (OS 15–30 months: head/neck, skin/breast and kidney/ bladder/ retroperitoneum/adrenal) and poor (OS <15 months: nervous system, connective/soft tissue, lymph nodes/spleen, cardiac/mediastinal and bones/joints). [4]. We retrospectively analyzed the clinicopathological and treatment outcome of 31 patients with MS to facilitate the diagnosis and treatment of this rare malignancy.

Imaging

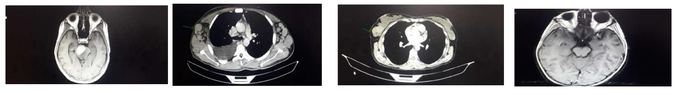


Fig. 1a. MRI brain showed lesion involving the right globus pallidus, right internal capsule and right caudate nucleus.
Fig. 1b. CTthorax showed few lymphnodes in b/l axilla
Fig. 1c. CT thorax showed homogenously enhancing well- defined soft tissue density lesion is involving breast
Fig. 1d MRI head showed Presence of ill-defined extraocular altered signal intensity area is noted in extraconal and intraconal compartment in orbit

Objective

In rare cases, haematological malignancies can manifest as an extramedullary malignant myeloid precursor cell mass. Myeloid sarcoma (MS) is a type of leukaemia that can be acute or chronic. At our institute, we will discuss the clinicopathological features and treatment response of patients with myeloid sarcoma (MS). (Table1&2)

Table 1. Anatomical locations and clinical symptoms in 31 patients

Anatomic locations	Number	%	Clinical manifestations
Lymph nodes	7	22.60	Multiple superficial swelling of lymph nodes
Bones and joints (Vertebrae, scapula, fibula, skull)	5	16.13	Back pain /lower limb weakness, tingling and numbness, bladder and bowel incontinence.
Breast	2	6.45	Breast lump
Mediastinum	2	6.45	Cough, breathlessness, chest pain
Reproductive organs (cervix, uterus, ovary, vault)	3	9.70	Abdominal pain, vaginal bleeding and menstrual disorders.
Testicle	1	3.22	Presented with scrotal swelling
Gastrointestinal tract (oesophagus)	1	3.22	Difficulty in swallowing
Lung	1	3.22	Breathlessness, cough
Nasal passages and oropharynx, Tonsil	1	3.22	Nasal airway blockage; nasal bleeding.
	1	3.22	Pain while swallowing
Orbit	5	16.13	Swelling, dimness of vision
Muscle (gluteal muscle)	1	3.22	Buttock mass
Central nervous system (thalamus)	1	3.22	Headache, lump and vomiting

Histopathology

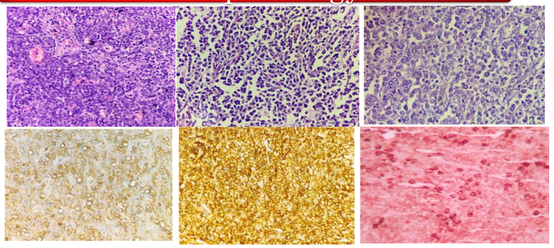


Fig. 2a. MS of breast, Fig. 2b. MS of lymphnode, Fig. 2c. MS of spine, Fig. 2d. LCA positive, Fig. 2e. CD 117 positive, Fig. 2f. MPO positive

Materials & Methods

We described the clinicopathological features and treatment response of 31 MS patients at the Medical oncology department of Gujarat Cancer Research Institute in Ahmedabad, Gujarat, India from January 2010 to December 2015, as well as the relevant literature. MS patients were given systemic chemotherapy using AML-like regimens only, or local treatment (radiation, surgery) with or without systemic chemotherapy using AML-like regimens.

Table 2. The clinicopathological and treatment outcome of MS patients divided into C and SRC treatment strategies

Characteristics	Chemotherapy treatment only (N=19)	Surgery+Radiation treatment±chemotherapy treatment (N=12)	P
Age, median (range), yr	37 (6-67)	35 (8-68)	0.027
Gender, N (%)Male/female	9 (47.36) / 10 (52.64)	6(50.0)/6(50.0)	0.675
White blood cells, $\times 10^9$/L, median (range)	7.70 (2.9-387)	9.20 (4.5-126.60)	0.018
Hemoglobin, g/L, median (range)	10.40 (6.5-15.2)	10.6 (7.80-14.70)	0.067
Platelet, $\times 10^9$/L, median (range)	315 (12-398)	386.50 (222-715)	0.027
LDH level, N (%)WNR/ANR	8 (42.11) / 11(57.89)	3(25.0)/9(75.0)	0.039
Primary involved site, N (%)	19 (100)	12(100)	
Lymphnodes (N=7, 22.58%),	6 (31.58)	1 (8.33)	
Bones (N=5, 16.13%)	2 (10.53)	3 (25)	
orbit (N=5, 16.13%)	3 (15.79)	2 (16.67)	-
Reproductive organs (N=3,9.68%).	2 (10.53)	1 (8.33)	
Others(N=11,35.48)	6 (31.58)	5 (41.67)	
Number of lesions, N (%) Solitary/multiple	9 (47.37) / 10 (52.63)	9(75.0)/3(25.0)	0.054
Cytogenetics, N (%) Normal/philadelphia chromosome	16(84.21)/ 3(15.79)	10(83.33)/2(16.67)	0.048
Chemotherapy regimen (N=31), N (%) 7+3/Tyrosine kinase inhibitor (Imatinib)	16(84.21)/ 3(15.79)	11(91.67)/1(8.33)	0.058
Radiotherapy dose, gray, median (range)	0	20(20-30)	-
Treatment outcome, N (%)CR/non-CR	8 (42.11)/11(57.89)	8(66.67)/4(33.33)	0.035
Associated to AML/CML, N (%)	06 (31.58)/ 13(68.42)	3(25.0)/9(75.0)	0.053
Survival, N (%) Alive/death	15(78.95)/4(21.05)	10(83.33)/2(16.67)	0.0328
Cause of death, Disease progression, infection N (%)	3 (15.79)/1(5.26)	1(8.33)/1(8.33)	0.72
Survival, months, median (range)	36 (12-72)	36 (12-60)	0.006

Summary

Study included 31 patients ranging in age from 6 to 68 years. (median: 32years; mean: 35.8years). There were 15 male and 16 female with a ratio of 0.9:1. The MS occurrence was most common at the lymphnodes (N=7, 22.6%), followed by Bones (N=5, 16.13%) and orbit (N=5, 16.13%) and reproductive organs (N=3, 9.70%). The MS of 5 patients (16.13%) were associated with AML, 5 (16.13%) patients were associated with CML and 21(67.74%) patients had de novo isolated MS. Twelve patients (38.71%) were treated with surgery and/or radiotherapy, chemotherapy (SRC) and nineteen (61.29%) with chemotherapy (C). Sixteen patients (51.61%) achieved a complete remission (CR), ten (32.26%) achieved a partial remission(PR), and five(16.13%) had progression. After treatment, the number of patients who achieved a CR was lower in the C group (N=8, 42.11%) than in the SRC group (N=8, 66.67) (P =0.035). Two patients in the SRC group and four in the C group died during the follow-up period (P =0.72). Survival rates for the SRC and C treatment groups were 83.3 percent and 78.9 percent, respectively (P=0.0328), with both groups lasting 36 months.

Discussion

To diagnose MS, histopathology, immunohistochemistry, and imaging must be used in tandem. As soon as possible, induction chemotherapy or a tyrosine kinase inhibitor (imatinib) should be administered. Symptomatic lesions or tumours causing organ obstruction are treated with surgery and/or radiotherapy. To describe the characteristics of MS and the role of targeted treatment, prospective controlled trials are required.

References

1. Wilson CS, Medeiros LJ. Extramedullary manifestations of myeloid neoplasms. Am J Clin Pathol. 2015;144:219-39.
2. Kawamoto K, Miyoshi H, Yoshida N, et al. Clinicopathological, cytogenetic, and prognostic analysis of 131 myeloid sarcoma patients. Am J Surg Pathol. 2016;40:1473-83.
3. Kaygusuz G, Kankaya D, EkinciC, Topçuoğlu P, Kuzu Myeloid sarcomas: A clinicopathologic study of 20 cases. Turk J Haematol. 2015;32:35-42.
4. Goyal G, Bartley AC, Patnaik MM, Litzow MR, Al- Kali A, Go RS. Clinical features and outcomes of extra medullary myeloid sarcoma in the United States: analysis using a national data set. Blood Cancer J. 2017;7(8):e592.