Clinico-Pathological Profile of Relapsed Multiple Myeloma in Low-Resource Setting: A Single-Center Study from Nepal

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Abstract

Introduction:
Multiple myeloma is a plasma cell malignancy with improved survival in the modern era; however, relapse remains inevitable in most patients. Data on relapsed multiple myeloma from Nepal are limited.

Objective:
To study the clinico-pathological profile, treatment patterns, and outcomes of relapsed multiple myeloma.

Methods:
A descriptive case series study was conducted at a tertiary care center in Nepal from January 2023 to August 2025. Patients with relapsed multiple myeloma were analyzed for clinical, laboratory, radiological, and treatment-related parameters.

Results: Twelve patients were included in the study. Mean age of presentation was 61.8 years (range: 44 – 74 years) with a male predominance (75%). Bone pain was the most common symptom (83%). Raised beta-2 microglobulin was seen in 78%, and lytic bone lesions in 75%. IgG kappa was the predominant subtype (67%). PET-CT and cytogenetics was done in 17%. All patients received bortezomib-based therapy initially, however Carfilzomib based triplet regimen was restricted to 17% only after relapse. Total duration of follow up since first diagnosis was 110 months and survival at last follow-up was 83%.

Conclusion:
Relapsed multiple myeloma poses significant challenges in resource-limited settings due to restricted diagnostic and therapeutic options.

Keywords: Multiple myeloma, Relapse, Bone pain, Lytic lesion, Nepal

Introduction

Multiple myeloma is a clonal plasma cell disorder accounting for approximately 10% of hematological malignancies worldwide (1,2). It is characterized by monoclonal protein production, bone marrow infiltration, osteolytic bone lesions, renal dysfunction, anemia, and hypercalcemia (1,3). Over the past two decades, the introduction of proteasome inhibitors, immunomodulatory drugs, and autologous stem cell transplantation has significantly improved survival outcomes (4).

Despite these advances, most patients eventually experience disease relapse (5-7). The management of relapsed MM requires risk stratification, advanced diagnostics, and access to novel agents, which remain limited in low- and middle-income countries like Nepal (8). This study aims to describe the clinico-pathological profile and treatment outcomes of relapsed MM in a real-world, resource-constrained setting.

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Materials and Methods

Study Design and Setting

This was a single-center, descriptive study case series study conducted at Vayodha Hospital, Nepal.

Study Population

Patients diagnosed with relapsed multiple myeloma and treated between January 2023 and August 2025 were enrolled. Relapse was defined based on Clinical and standard set of Biochemical, Radiological parameters.

Data Collection

Data were collected from hospital records and included:

- Demographic details
- Clinical presentation
- Laboratory investigations
- Radiological findings
- Serum immunofixation profiles
- Treatment regimens (initial and post-relapse)
- Outcomes

Diagnostic Criteria

Diagnosis and relapse assessment were based on standard International Myeloma Working Group (IMWG) criteria, subject to available investigations. Patients with suspected relapse were further investigated through hematological, biochemical and radiological investigations. Increase in serum or urine M-protein, Development of new lytic lesions, Rising plasma cell burden, Recurrence of CRAB features.

Data Analysis

Data were analyzed descriptively and expressed as frequencies and percentages.

Result

Demographic Profile

Among the 12 patients, 9 (75%) were male and 3 (25%) were female. Mean age of presentation was 61.8 years (range: 44 – 74 years). Median age was 68 years. The mean follow-up duration was 73 months (range: 42–110 months).

Clinical Presentation

Bone pain was the most common symptom (83%), followed by easy fatigability (42%), neurological symptoms (25%), transfusion dependency (17%), and proptosis (8%).

Laboratory and Radiological Findings

Anemia and hypercalcemia were each present in 42% of patients. Deranged RFT was present in 25%. Raised beta-2 microglobulin was observed in 78%, while lytic bone lesions were detected in 75%. Monoclonal band was detected in 83%. PET-CT and cytogenetic studies were performed in only 17% of cases due to limited availability and financial constrained.

Serum Immunofixation

IgG kappa was the predominant subtype (67%), followed by IgG lambda (25%) and IgA kappa (8%).

Treatment Patterns

All patients received Bortezomib-based therapy (Bortezomib, Dexamethasone and Lenalidomide) as initial treatment. Autologous stem cell transplantation in first remission was performed in 17%, and 83% received lenalidomide maintenance for two years. Post-relapse treatment varied, reflecting financial limitations and drug availability. Only one patient received second transplant after relapse.

Outcomes

Total duration of follow up since first diagnosis was 110 months. Mean duration of follow up was 73 months (range: 42-110 months). Till data was analyzed 10 patients (83%) were alive, while 2 patients (17%) died.

Table I. Gender distribution of patients with relapsed multiple myeloma (n = 12)

Gender	Number of cases	Percentage(%)
Male	9	75
Female	3	25

Table II. Clinical symptoms at presentation in relapsed multiple myeloma

Clinical features	Number	Percentage (%)
Bone pain	10(12)	83
Easy fatigability	5(12)	42
Neurological symptoms	3(12)	25
Transfusion dependency	2(12)	17
Proptosis	1(12)	8

Table III. Laboratory and radiological findings at relapse

Investigations	Number	Percentage (%)
Anemia	5(12)	42
Pancytopenia	2(12)	17
Deranged renal function test	3(12)	25
Hypercalcemia	5(12)	42
Raised beta-2 microglobulin	9(12)	78
Lytic bone lesions	9(12)	75
Monoclonal ("M") band	10(12)	83
PET-CT performed	2(12)	17
Cytogenetic analysis performed	2(12)	17

Table IV. Serum immunofixation profile

Immunoglobulin subtype	Number	Percentage (%)
IgG kappa	8(12)	67
IgG lambda	3(12)	25
IgA kappa	1(12)	8

Table V. Initial treatment modalities

Treatment	Number	Percentage (%)
Bortezomib-based regimen	12(12)	100
Autologous stem cell transplant in first remission	2(12)	17
Lenalidomide maintenance	10(12)	83

Table VI. Treatment regimens after relapse

Treatment regimen	Number	Percentage (%)
Carfilzomib + Pomalidomide + Dexamethasone	2(12)	17
Carfilzomib + Cyclophosphamide + Dexamethasone	2(12)	17
Pomalidomide + Dexamethasone	2(12)	17
Lenalidomide + Dexamethasone	4(12)	33
Melphalan + Prednisolone + Thalidomide	2(12)	17
Autologous stem cell transplant in second remission	1(12)	8

Table VII. Patient outcomes at last follow-up

Outcome	Number	Percentage (%)
Alive	10(12)	83
Death	2(12)	17

Discussion

Relapsed multiple myeloma remains a major therapeutic challenge, particularly in resource-limited settings such as Nepal(9,10,11). In our study median age of presentation was 64 years and study from India by Reddy et all reported disease recurrence in fifth decade of life with male predominance (17). Study by Meletios et all, also demonstrated median age between 50-65 years (18).

In this study, bone pain, anemia, hypercalcemia, and raised β_2-microglobulin were the most common clinical and laboratory findings, consistent with study by Meletios et all. and other literatures (18). Nearly 50% of patients had deranged renal function in the study by Meletios et all, however renal dysfunction limited to 25% in present study. Most common subtype was IgG k was found in 67% in present study and 64% reported by Alegre et all in their series (16).

Advanced diagnostic tools such as PET-CT and cytogenetic risk stratification were utilized in only a minority of patients due to cost and limited availability of advanced molecular tests in the country.

Carfilzomib based triplet was offered in 34% of patients and pomalidomide were used in 34% cases only in the form of doublet and triplet. Treatment decisions were largely influenced by financial constraints and availability of drugs in the country rather than disease biology. Only one patient received second transplant in remission. One third of patients in whom Lenalidomide was discontinued for more than five years again rechallenged.

The relatively favorable survival observed in this cohort reflects the benefit of second-generation proteasome inhibitor-based therapy; however, access to standardized relapse protocols and transplant facilities remains limited. These findings highlight the need for affordable diagnostics, expanded access to essential drugs, and national treatment strategies tailored to low-resource income settings.

Conclusion

Relapsed multiple myeloma remains a major challenge in Nepal. Improved access to affordable diagnostics and therapies is essential.

Conflict of Interest

None declared.

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