

Early-Onset Plasmacytoma

A National Cancer Database Analysis of Clinical Features, Treatment Patterns, and Survival

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BACKGROUND

- Early-onset plasma cell disorders are an increasing public health concern.
- Plasmacytoma in younger adults is poorly characterized.
- It is unknown whether younger and older patients differ in clinical features, treatment, and outcomes.

METHODS

Data source: National Cancer Database, adults diagnosed 2004–2023.
Exposure: early-onset plasmacytoma defined as age <50 years at diagnosis.
Treatment outcomes: multivariable logistic regression for radiation, surgery, and palliative procedures.
Survival analysis: adjusted Cox models for OS; 2023 diagnoses excluded from survival analyses due to incomplete follow-up.

COHORT PROFILE

20,295 patients

- 2,897 (14.3%) had early-onset disease.
- Mean age: 41.5 vs 68.3 years.
- Bone plasmacytoma predominated in both groups (78.8% vs 79.3%).
- Head and neck/upper aerodigestive involvement was more frequent in early-onset extramedullary disease (48.0% vs 31.4%).

CONCLUSIONS

Early-onset plasmacytoma is a clinically and demographically distinct subgroup.

- Early-onset plasmacytoma had a higher proportion of men and Black/African American patients.
- Younger patients were more often privately insured and treated at academic centers and had a lower comorbidity burden.
- Bone plasmacytoma predominated across age groups; among patients with EMP, head and neck/upper aerodigestive involvement was substantially more frequent in younger patients.
- Patients aged <50 years had greater use of local therapy, including radiation and surgery, less palliative care, lower 90-day all-cause mortality after surgery, and superior overall survival.

Results

Table 1. Selected Patient Demographic, Clinical, Facility, and Treatment Characteristics

Characteristic	Age ≥50 years (n=17,398)	Age <50 years (n=2,897)	P value
Demographic and clinical characteristics			
Age at diagnosis, years, mean (SD)	68.26 (10.43)	41.45 (7.11)	<0.001
Sex			<0.001
Male	10,531 (60.5%)	1,945 (67.1%)	
Female	6,867 (39.5%)	952 (32.9%)	
Race			<0.001
White	14,180 (81.5%)	2,118 (73.1%)	
Black	2,473 (14.2%)	565 (19.5%)	
Asian	311 (1.8%)	85 (2.9%)	
Other/unknown	434 (2.5%)	129 (4.5%)	
Facility, insurance, and area characteristics			
Facility type			<0.001
Community Cancer Program	1,229 (7.1%)	100 (5.0%)	
Comprehensive Community Cancer Program	6,733 (38.7%)	622 (30.9%)	
Academic/Research Program	5,975 (34.3%)	900 (44.8%)	
Integrated Network Cancer Program	3,451 (19.8%)	388 (19.3%)	
Other specified cancer program	10 (0.1%)	0 (0.0%)	
Primary payer			<0.001
Uninsured	387 (2.2%)	224 (7.7%)	
Private insurance	5,949 (34.2%)	1,999 (69.0%)	
Medicaid	789 (4.5%)	405 (14.0%)	
Medicare	9,574 (55.0%)	142 (4.9%)	
Other government	378 (2.2%)	64 (2.2%)	
Insurance status unknown	321 (1.8%)	63 (2.2%)	
Comorbidity and treatment characteristics			
Charlson-Deyo score			<0.001
0	13,222 (76.0%)	2,545 (87.8%)	
1	2,730 (15.7%)	255 (8.8%)	
2	918 (5.3%)	57 (2.0%)	
≥3	528 (3.0%)	40 (1.4%)	
Treatment timing and radiation details			
Treatment start, days from diagnosis, median (IQR)	22.00 (3.00-47.00)	19.00 (0.00-45.00)	<0.001
First surgical procedure, days from diagnosis, median (IQR)	0.00 (0.00-7.00)	0.00 (0.00-4.00)	0.015
Radiation start, days from diagnosis, median (IQR)	38.00 (20.00-62.00)	42.00 (24.00-67.00)	<0.001
Radiation end, days from radiation start, median (IQR)	29.00 (0.00-36.00)	33.00 (13.00-38.00)	<0.001
Radiation dose category			
No radiation	4,953 (29.8%)	646 (23.5%)	
RT <30 Gy	571 (3.4%)	53 (1.9%)	
RT 30-39.9 Gy	844 (5.1%)	101 (3.7%)	
RT 40-50 Gy	3,282 (19.7%)	657 (23.9%)	
RT >50 Gy	499 (3.0%)	144 (5.2%)	
RT dose unknown	6,471 (38.9%)	1,153 (41.9%)	

