

Clinical characteristics and prognosis of primary lung cancer in the Adolescent and Young Adult (AYA) population

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●Background

- Primary lung cancer in the adolescent and young adult (AYA) is rare.
- Limited evidence is available regarding its clinicopathological features.
- We aimed to evaluate the clinicopathological characteristics and prognoses of AYA patients diagnosed with primary lung cancer

●Methods

Single institution, retrospective study based on the institutional cancer registry

<Inclusion criteria>

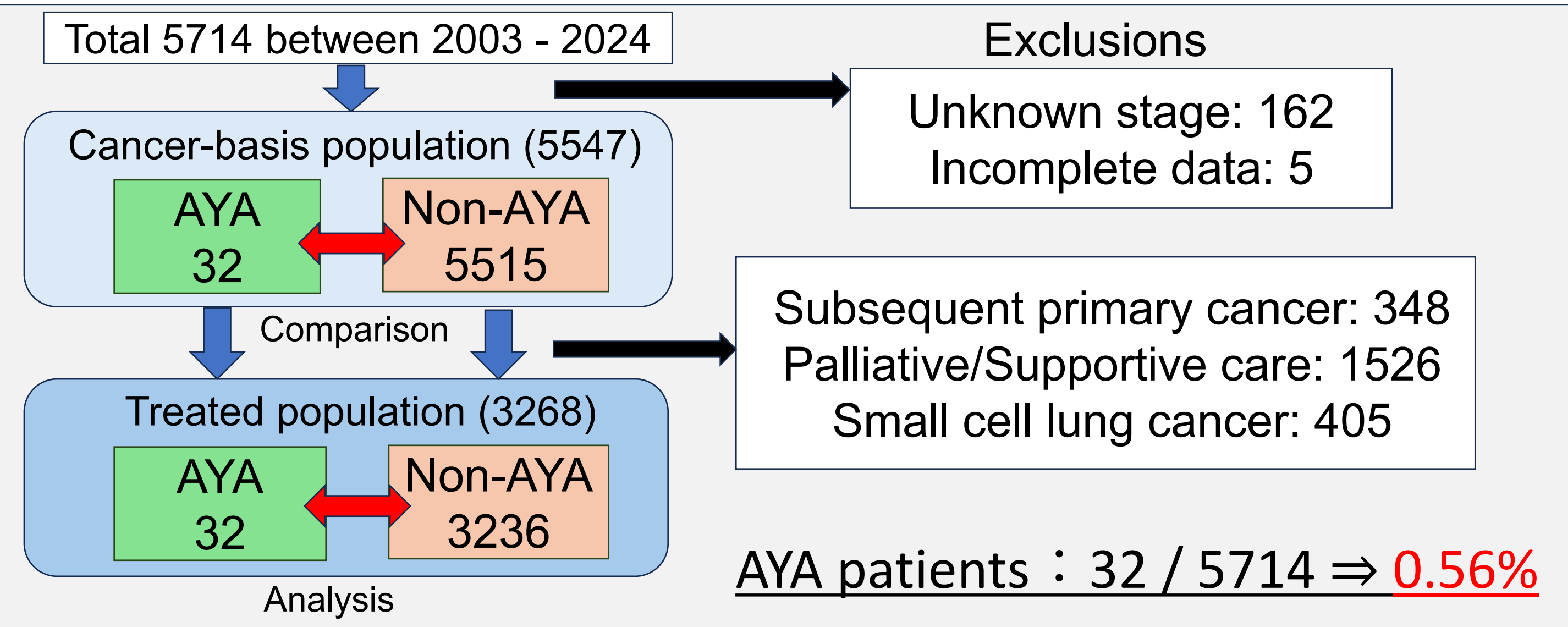
- Histologically confirmed primary lung cancer between 2003 - 2024

<Exclusion criteria>

- Unknown stage, Insufficient data

AYA generation: Age < 40, Non-AYA generation: Age ≥ 40

●Results



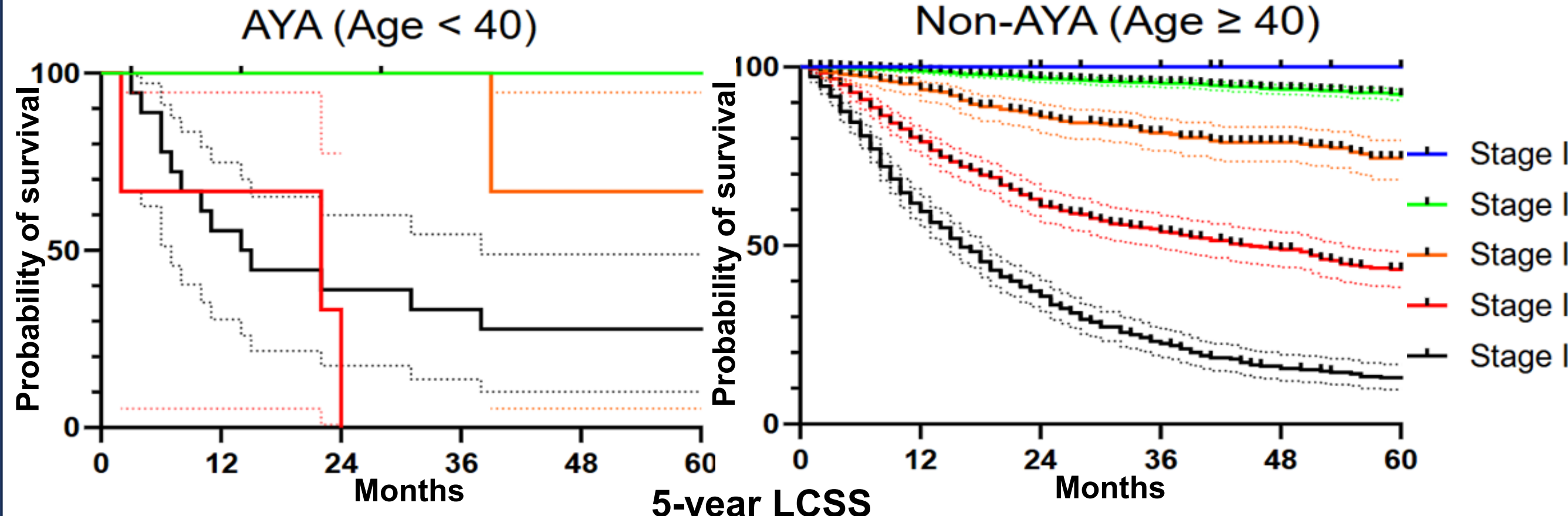
✓ Characteristics in Cancer-basis population

Characteristics	AYA (n = 32)	Non-AYA (n = 5515)	p value
Age	35.5 (22 - 39)	72 (40 - 98)	-
Gender			0.451 †
Male/ Female	20 (62.5%) / 12 (37.5%)	3871 (70.2%) / 1644 (29.8%)	
Histology			0.092††
Adenocarcinoma	20 (62.5%)	2771 (50.2%)	
Small cell carcinoma	0 (0%)	573 (10.4%)	
Others	12 (37.5%)	2171 (39.4%)	
Stage			0.045 ††
Stage 0	0	36 (0.7%)	
Stage I	8 (25%)	2174 (39.4%)	
Stage II	3 (9.4%)	484 (8.8%)	
Stage III	3 (9.4%)	1119 (20.3%)	
Stage IV	18 (56.2%)	1700 (30.8%)	
Diagnosis period			0.013†
< 2014	21 (65.6%)	2338 (42.4%)	
≥ 2014	11 (34.4%)	3177 (57.6%)	
Median follow-up time	23 months	17 months	-

There is no conflict of interest.

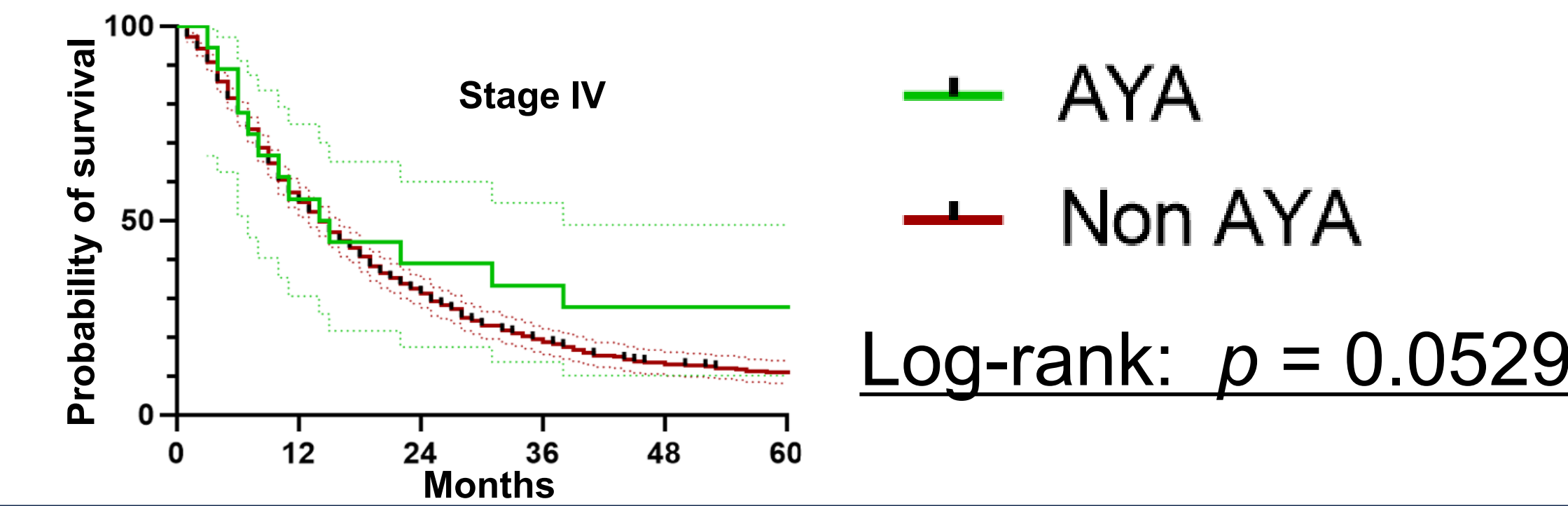
Prognostic assessment (Treated population, n =3268)

✓ Lung cancer specific survival (LCSS) based on stage stratification



	Median follow-up time	Stage 0	Stage I	Stage II	Stage III	Stage IV
Age < 40 (n = 32)	23 months	-	100%	66.7%	0%	27.8%
Age ≥ 40 (n = 3236)	34 months	100%	91.9%	74.4%	43.3%	12.9%

✓ Direct comparison in Stage IV disease



✓ Multivariable analysis for LCSS

Factors	HR	95% CI	p value
Sex, male	1.54	1.33-1.79	<0.001
AYA	0.57	0.35-0.94	0.026
Diagnosis, ≥2014	0.78	0.68-0.89	<0.001
Pathological stage			<0.001
Stage 0	0.00	0.00-inf	
Stage I		Ref.	
Stage II	2.92	2.22-3.89	
Stage III	9.71	7.90-11.9	
Stage IV	25.2	20.6-30.9	
Histology			<0.001
Adenocarcinoma		Ref.	
Others	1.21	1.13-1.30	

Detailed characteristics in Stage IV AYA period

No.	Sex	Age	Smoking	Diagnosis	Histology	Gene mutation	First treatment	Immunotherapy	TKI inhibitor	Months	Outcome
1	M	31	+	≤2013	Adenocarcinoma		Chemotherapy		Gefitinib	7	Dead
2	M	38	-	≤2013	Neoplasm		Chemotherapy			4	Dead
3	F	34	+	≤2013	SCC		Chemotherapy			6	Dead
4	M	36	-	≤2013	Adenocarcinoma		Chemotherapy		Gefitinib	14	Dead
5	M	37	-	≤2013	NSCLC		Chemotherapy		Gefitinib	6	Dead
6	M	28	+	≤2013	LCNEC		Chemotherapy			87	Alive
7	F	36	-	≤2013	SCC	None	Chemotherapy		Erlotinib	11	Dead
8	F	38	+	≤2013	Adenocarcinoma,	EGFR+	Chemotherapy		Erlotinib, Gefitinib	31	Dead
9	M	39	+	≤2013	Adenocarcinoma		Chemotherapy			208	Alive
10	F	30	+	≤2013	SCC		Chemotherapy			10	Dead
11	M	34	+	≤2013	Adenocarcinoma	EGFR+	Chemotherapy		Gefitinib	38	Dead
12	F	31	+	≤2013	Adenocarcinoma	ALK+	Chemotherapy		Crizotinib	164	Alive
13	F	39	-	≤2013	Adenocarcinoma	None	Chemotherapy			136	Dead (SAH)
14	F	26	N/A	≤2013	Adenocarcinoma	ALK+	ALK inhibitor		Crizotinib	22	Dead
15	M	32	+	≥ 2014	SCC		Radiation			3	Dead
16	M	39	+	≥ 2014	Adenocarcinoma	None	Chemotherapy			15	Dead
17	M	39	+	≥ 2014	SCC		Radiation			8	Dead
18	M	35	+	≥ 2014	Adenocarcinoma	None	Radiation	Pembrolizumab		71	Alive

●Discussion

- AYA generation were diagnosed at more advanced stage compared to non-AYA generation.
- AYA status was independently associated with favorable LCSS after adjustment.
- Stage IV patients tended to be better survival, but not significantly, possibly due to small number of the study number.

●Conclusions

Despite presenting with more advanced disease, AYAs showed favorable LCSS, suggesting unique biological characteristics and treatment responsiveness in this population.