

Distinct clinical impact of TA-MUC1 expression across histological subtypes in non-small cell lung cancer

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Background

• **Tumor-associated mucin-1 (TA-MUC1)** is an aberrantly glycosylated MUC1 protein that is highly expressed in various human epithelial cancers, making it an attractive target for cancer therapy.

• However, its clinicopathological and biological significance and association with prognosis remain unclear. In addition, although lung cancer comprises diverse histological subtypes, studies evaluating differences in biological background and expression patterns of TA-MUC1 were limited.

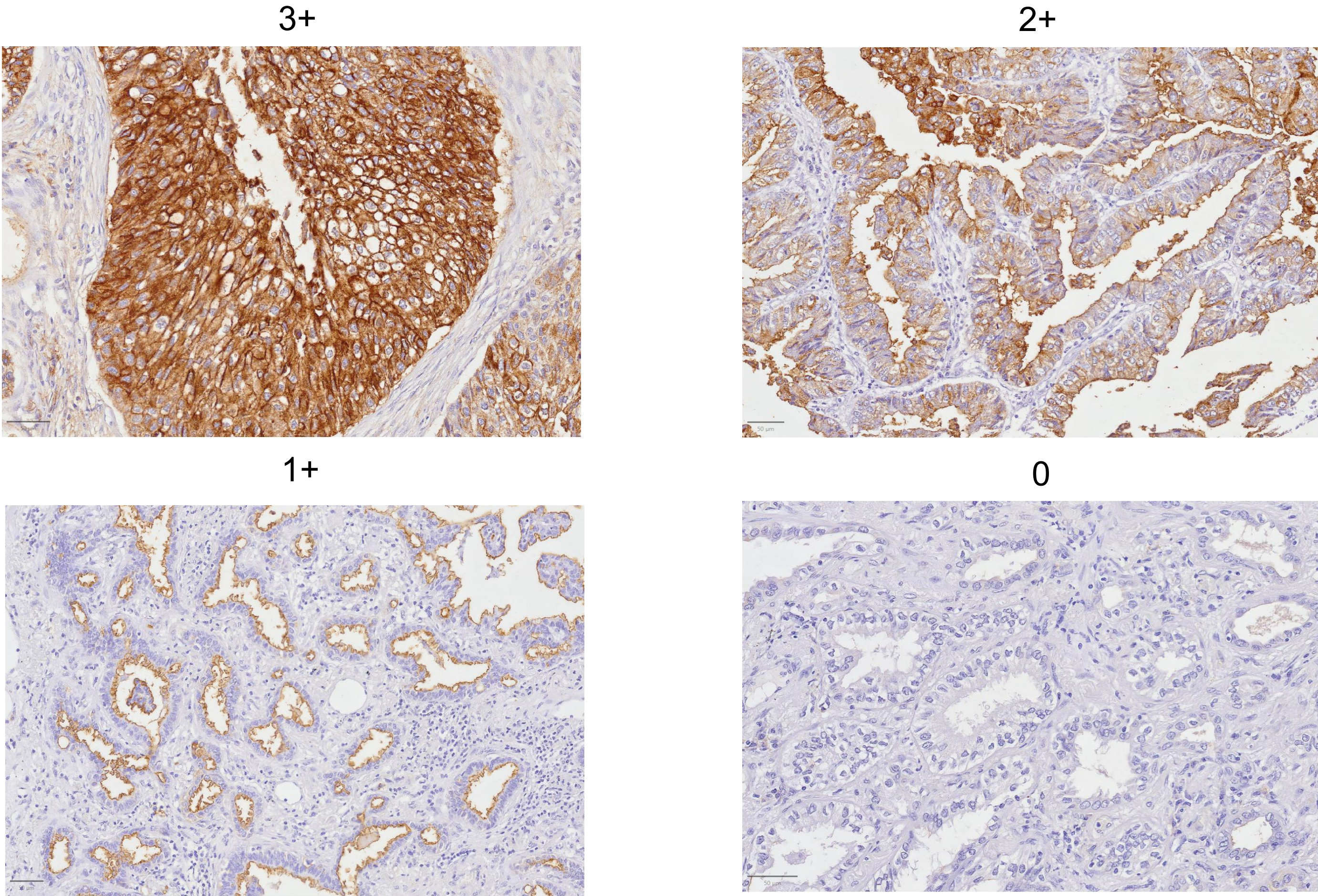
Material and Method

• This study included 350 cases of NSCLC who underwent lung resection in Juntendo University School of Medicine (Tokyo, Japan).
{Squamous cell carcinoma (Sq) [n = 86] and Adenocarcinoma (Ad) [n = 264] with 63 cases of invasive mucinous adenocarcinoma (IMA)}.

• TA-MUC1 expression was immunohistochemically evaluated. Staining intensity in membrane and cytoplasm regions was visually scored as 0, 1+, 2+, or 3+, and the H-score was calculated based on the percentage of tumor cells at each intensity level. The representative H-score was determined by adopting the maximum H-score of the membrane and cytoplasm regions, resulting in an H-score range from 0 to 300.

• High and low expression were defined using the median H-score as the cutoff, and clinicopathological characteristic, overall survival (OS), and relapse free survival (RFS) were retrospectively reviewed.

Representative Pathological Figures



Acknowledgements

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Disclosures

The authors declare no conflict of interest.

References

- Nath et al. Oncogenesis, 2013
- Huang et al. Oncotarget, 2017
- Takano K, et al. Mol Cancer Ther. 2026

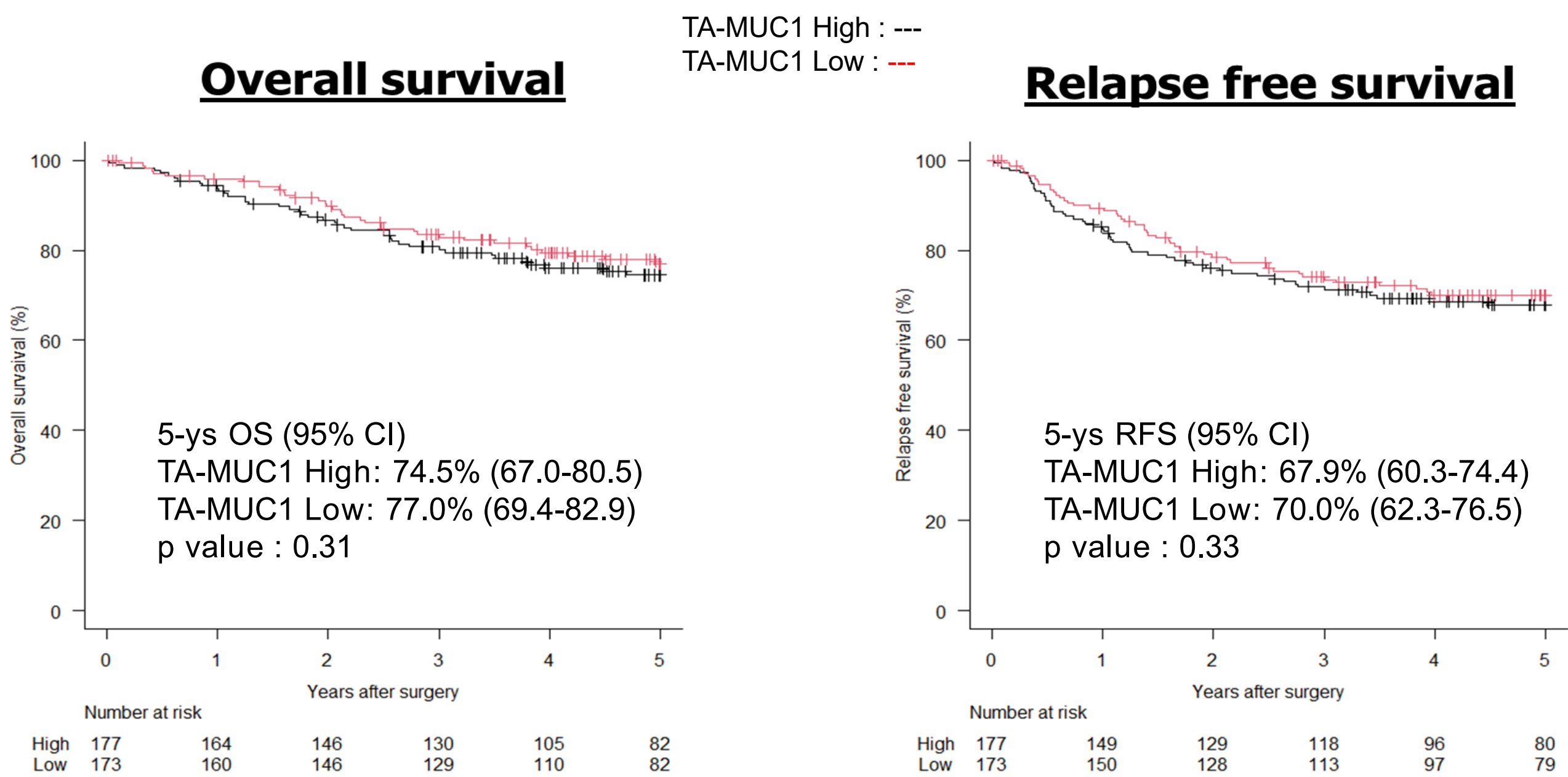
Result

Clinicopathological characteristics by TA-MUC1 expression in NSCLC

		TA-MUC1 High (N=177)	TA-MUC1 Low (N=173)	p value
Age	Median (range)	72 (36-90)	71 (33-89)	0.68
Sex	Male (%)	113 (64)	101 (58)	0.35
Pack year smoking	Median (range)	20 (0-180)	14 (0-212)	0.46
Histology	Ad	134 (76)	130 (75)	1
	Sq	43 (24)	43 (25)	
	0	2 (1)	4 (2)	
P-stage	I	111 (63)	116 (67)	0.31*
	II	36 (20)	24 (14)	
	III	26 (15)	23 (13)	
	IV	2 (1)	6 (3)	
Pathological size (mm)	Median (range)	23 (0-190)	22 (0-215)	0.16
Lymphatic invasion	No. (%)	25 (14)	16 (9)	0.18
Vessel invasion	No. (%)	52 (29)	42 (24)	0.34
TA-MUC1	H-score Median (range)	200 (120-300)	50 (0-110)	<0.01

Range indicates the minimum-maximum values. *: stage 0-I vs II-IV

All NSCLC



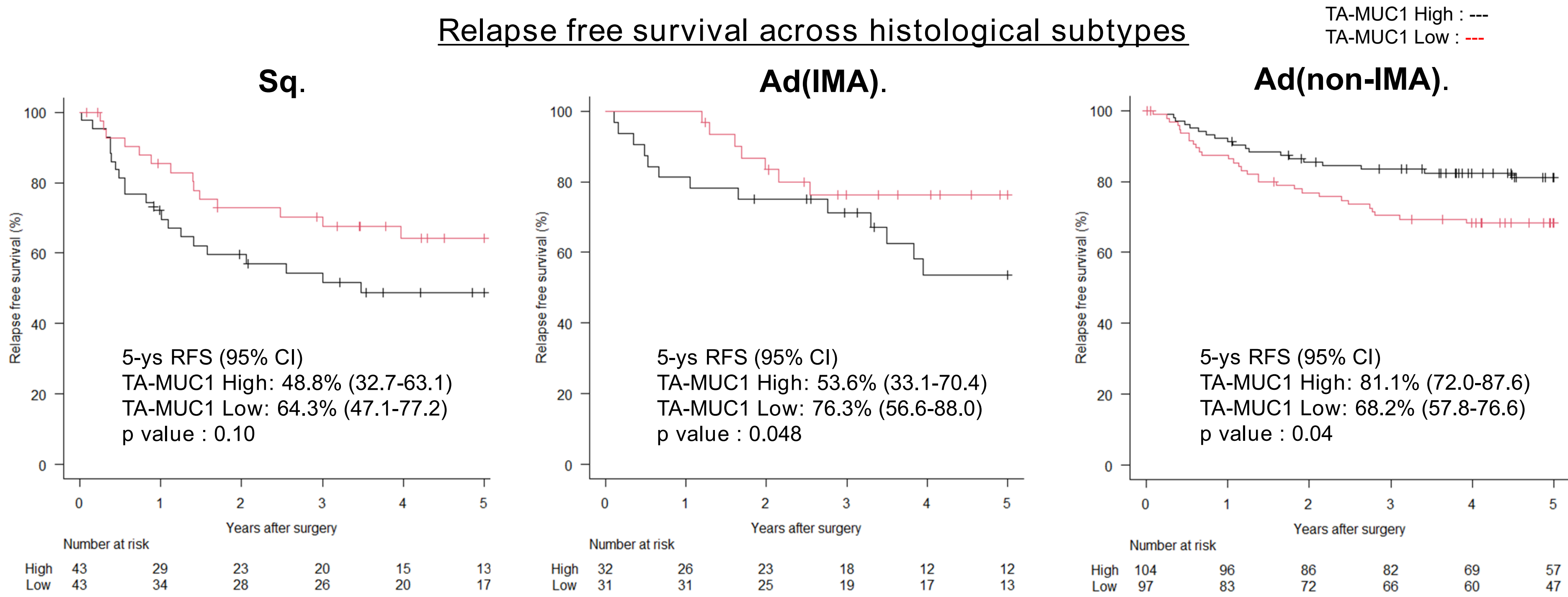
Histological Subtypes

Comparison of clinicopathological characteristics between TA-MUC1 High versus Low expression groups by histological subtypes

		Sq/High (N=43)	Sq/Low (N=43)	p value	Ad(IMA)/High (N=32)	Ad(IMA)/Low (N=31)	p value	Ad(non-IMA)/High (N=104)	Ad(non-IMA)/Low (N=97)	p value
Age	Median (range)	74 (53-86)	71 (51-85)	0.27	74 (45-83)	71 (40-85)	0.99	72 (36-90)	69 (33-89)	0.48
Sex	Male (%)	36 (84)	36 (84)	1	21 (66)	14 (48)	0.13	58 (56)	49 (51)	0.48
Pack year smoking	Median (range)	45 (0-159)	50 (3-162)	0.46	23 (0-144)	20 (0-104)	0.61	10 (0-180)	13 (0-212)	0.81
P-stage	0	0	0	0.67*	0	0	0.02*	2 (2)	4 (4)	0.87*
	I	18 (42)	21 (49)		16 (50)	25 (81)		78 (75)	69 (67)	
	II	15 (35)	11 (26)		9 (28)	5 (16)		11 (11)	9 (9)	
	III	9 (21)	10 (23)		5 (16)	1 (3)		12 (12)	12 (12)	
Pathological size (mm)	IV	1 (2)	1 (2)	0.20	2 (6)	0	0.01	1 (1)	3 (3)	0.18
	Median (range)	31 (15-182)	28 (10-100)		27.5 (4-215)	21 (8-100)		22 (0-190)	18 (0-62)	
	No. (%)	7 (16)	5 (12)		3 (9)	0		12 (12)	14 (14)	
Lymphatic invasion	No. (%)	23 (53)	21 (49)	0.83	2 (6)	0	0.49	22 (21)	26 (27)	0.41
Vessel invasion	No. (%)	7 (16)	5 (12)	0.76	3 (9)	0	0.24	12 (12)	14 (14)	0.68
TA-MUC1	H-score Median (range)	180 (120-290)	40 (0-110)	<0.01	110 (60-220)	30 (0-50)	<0.01	210 (150-300)	90 (0-140)	<0.01

Range indicates the minimum-maximum values. *: stage 0-I vs II-IV

Relapse free survival across histological subtypes



Summary and Conclusion

Comparison of High and Low expression groups

Histology	Median H-score	Clinicopathological Characteristics	Prognosis*
Sq	120	No difference	High<Low
Ad (IMA)	60	Larger and more advanced stage in High group	High<Low
Ad (non-IMA)	150	No difference	High>Low

*: RFS

TA-MUC1 expression and its clinical implications varied across histological subtypes of surgically resected NSCLC.

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