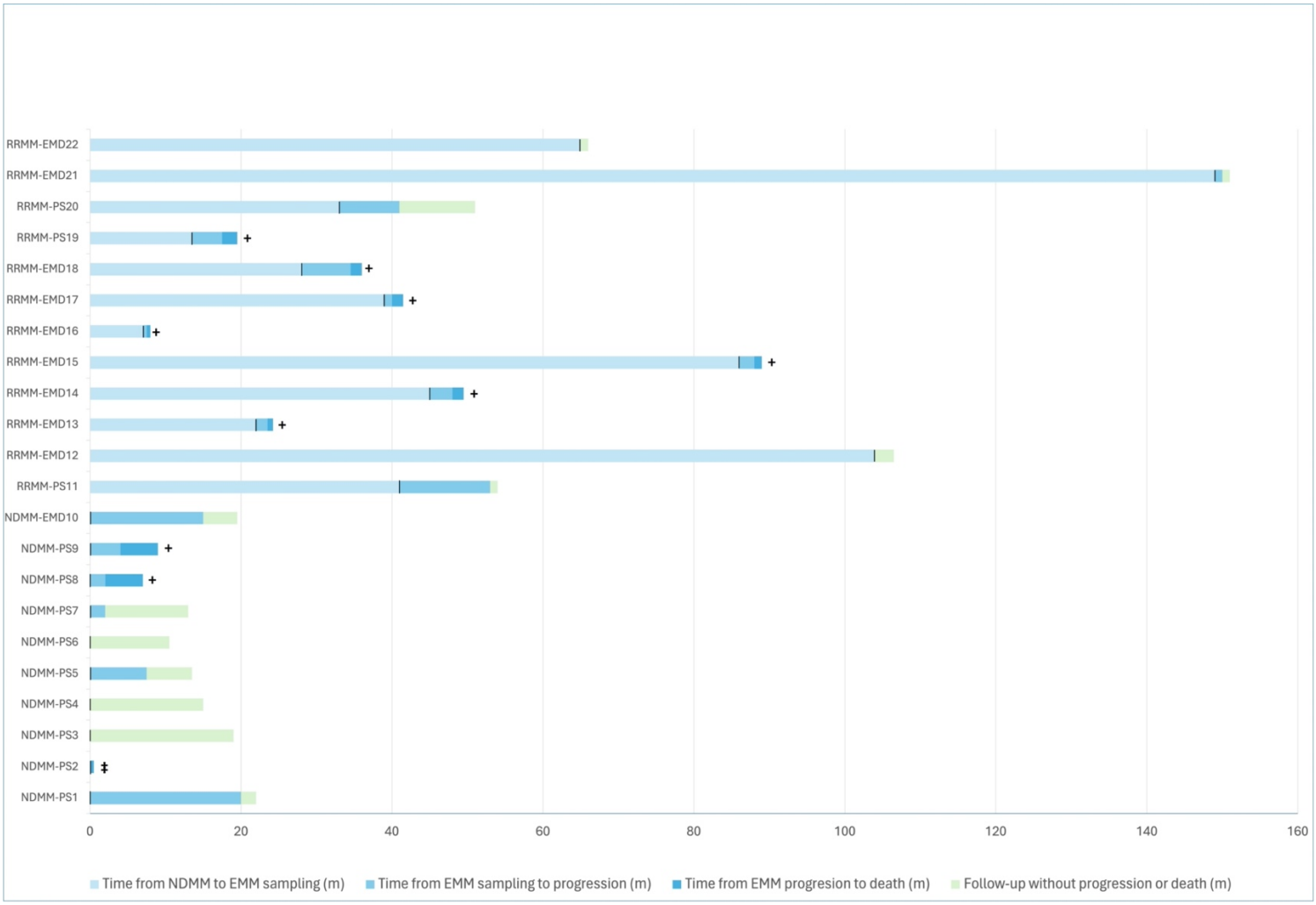
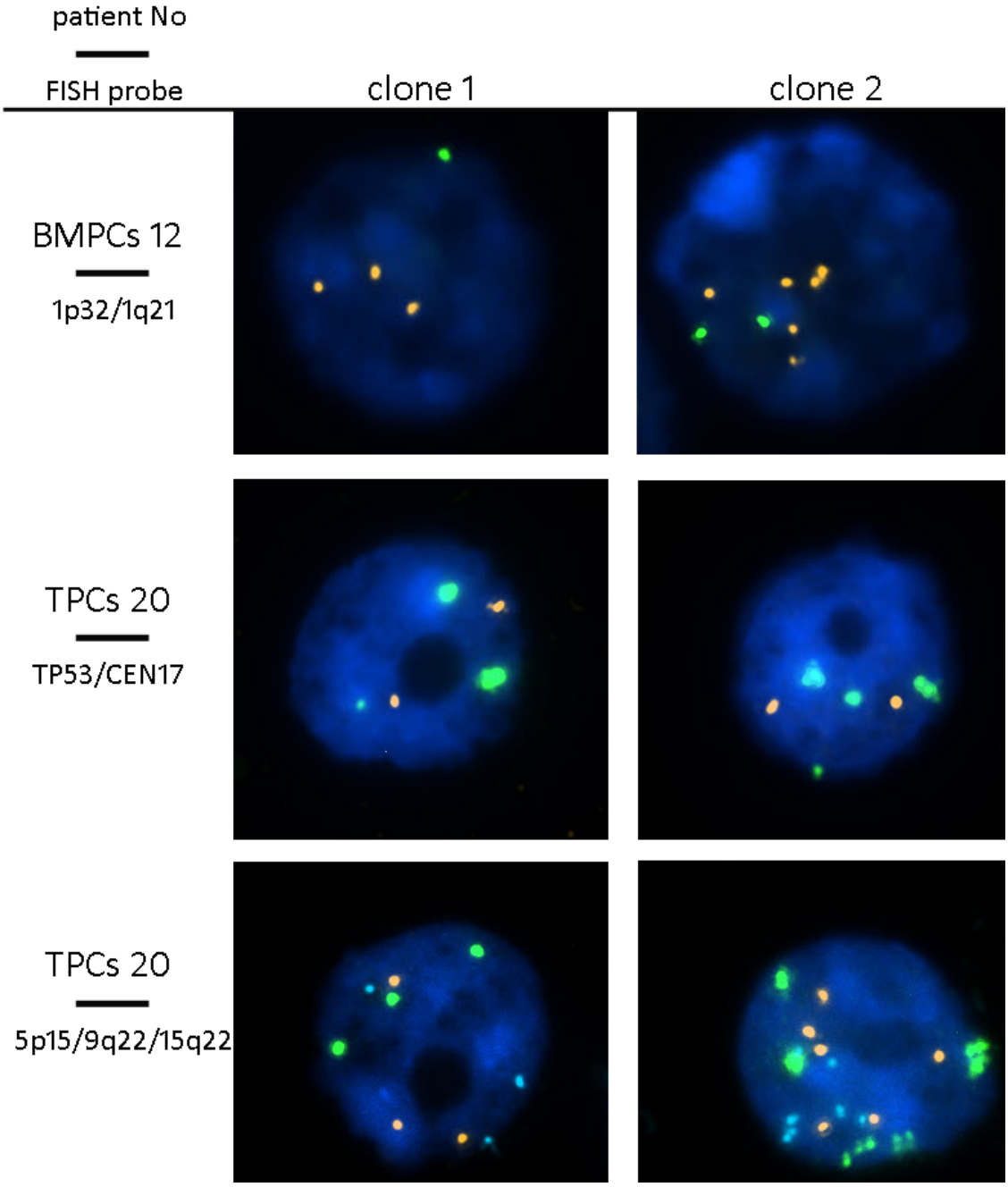
Supplementary Tables and Figures:

Supplementary Figure 1 - Survival in patients with paired samples.



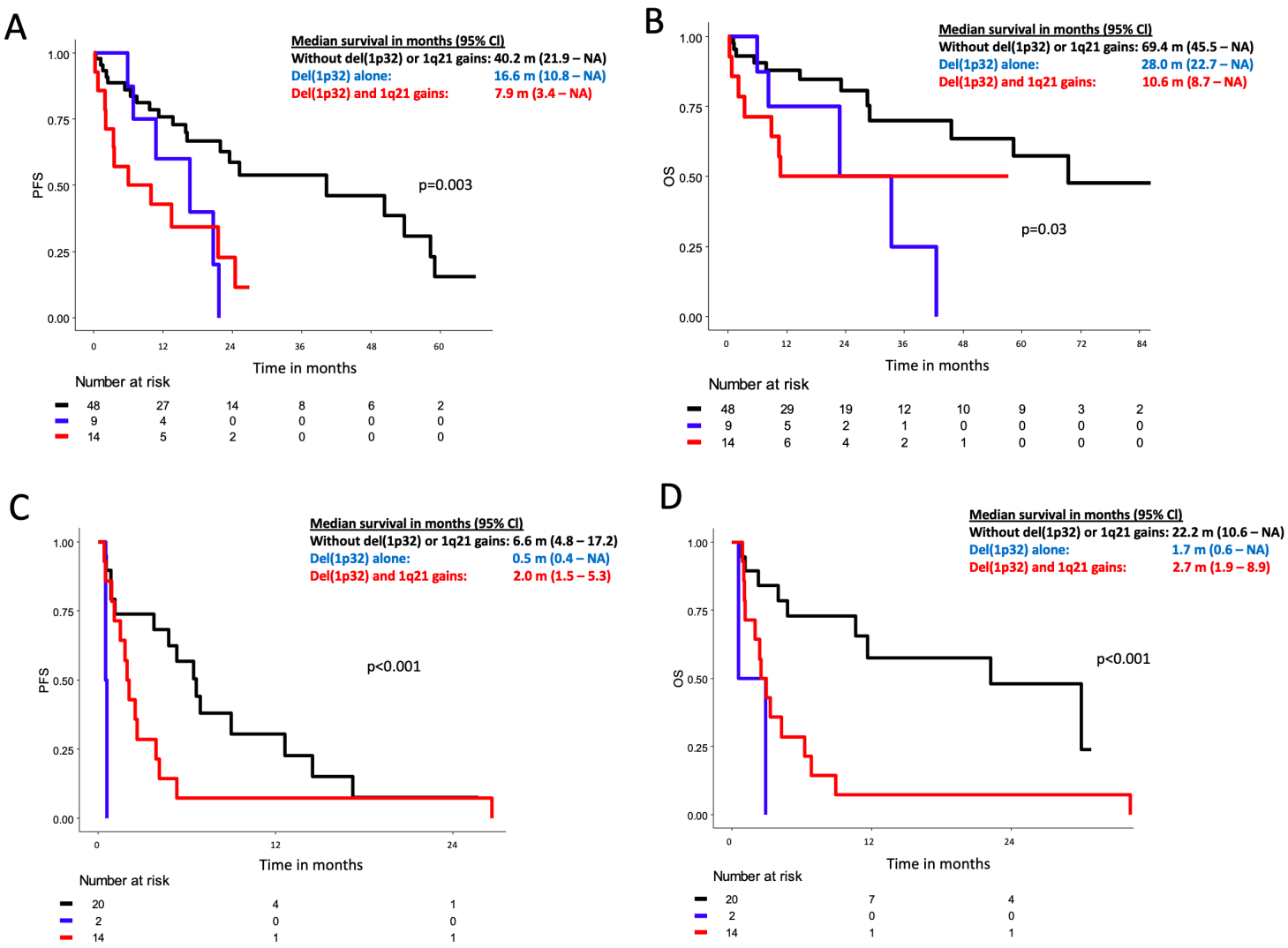
| - EMM sampling; + - death on disease progression; ‡ - death without disease progression

Supplementary Figure 2 - Examples of individual clones on microscope images.



In sample BMPCs 12, clone 1 presents with deletion of 1p32 (green signal) and gain of 1q21 (orange signals), in clone 2 the aberrant pattern is duplicated. In sample TPCs 20, clone 1 has trisomy of chromosome 17 (green centromeric signals) with deletion of one copy of TP53 gene (orange signals), clone 2 has tetrasomy of chromosome 17 and deletion of two copies of TP53 gene. In the same sample, there is one hyperdiploid clone with trisomies of chromosomes 5 (green signals), 9 (blue signals) and 15 (orange signals), and a second clone where these aberrations are duplicated.

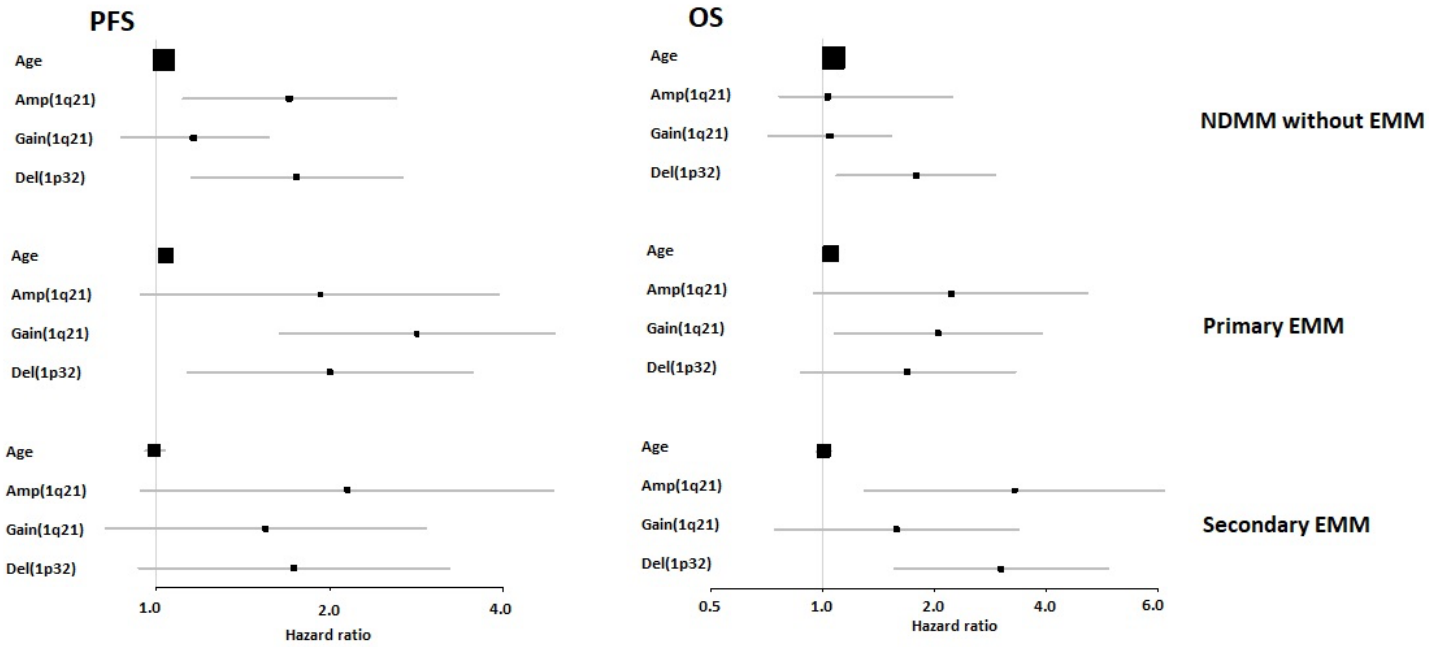
Supplementary Figure 3 - Kaplan-Meier curves illustrating survival intervals according to the presence of del(1p32) and 1q21 gains.



Progression Free Survival (PFS). Overall Survival (OS).

Panels show: A) PFS in primary EMM patients, B) OS in primary EMM patients, C) PFS in secondary EMM patients, and D) OS in secondary EMM patients. Cox univariate models were used for time-to-event response variables.

Supplementary Figure 4 - Hazard ratio of PFS/OS in separate chromosome 1 aberrations showed in forest plot model.



Cox univariate models (in case of time-event type of response variables)

Supplementary Table 1 – Characteristics of patients with paired samples

Patient no. (inc.EMM type)	Site of EMM	Age at EMM sampling (y)	gender	Monoclonal Ig type	ISS	Number of previous treatment lines before EMM sampling	Refractory status before EMM sampling
NDMM-PS1	skul	62	M	FLC only	1	0	NA
NDMM-PS2	rib	73	M	IgG kappa	3	0	NA
NDMM-PS3	sternum	71	M	FLC only	1	0	NA
NDMM-PS4	spine	61	F	IgG kappa	1	0	NA
NDMM-PS5	spine	73	M	IgA lambda	2	0	NA
NDMM-PS6	spine	79	F	IgG kappa	2	0	NA
NDMM-PS7	spine	63	M	IgG kappa	3	0	NA
NDMM-PS8	skull	64	F	FLC only	3	0	NA
NDMM-PS9	spine	57	M	FLC only	2	0	NA
NDMM-EMD10	liver	77	F	IgA kappa	3	0	NA
RRMM-PS11	orbital cavity	76	F	IgA kappa	1	2	double
RRMM-EMD12	peripheral nerve	68	F	FLC only	3	2	double
RRMM-EMD13	skin	76	F	FLC only	3	1	len
RRMM-EMD14	skin	68	F	FLC only	3	5	penta
RRMM-EMD15	skin	69	F	IgG kappa	2	7	penta
RRMM-EMD16	skin	70	M	IgG lambda	3	4	triple
RRMM-EMD17	skin	61	M	IgG lambda	1	8	penta
RRMM-EMD18	effusion	69	F	IgA lambda	3	3	triple
RRMM-PS19	maxila	79	F	IgG kappa	3	3	triple
RRMM-PS20	skull	78	F	IgG kappa	3	2	triple
RRMM-EMD21	chest wall	66	M	IgG kappa	1	9	penta
RRMM-EMD22	skin	74	M	IgG kappa	3	4	penta

Len – lenalidomide; double refractory – PI and IMID; triple class refractory – PI, IMID, anti-CD38 antibody; penta-refractory – 2 PIs, 2 IMIDs and anti-CD38 antibody

Supplementary table 2 - Cytogenetic data of patients` groups.

Category	NDMM without plasmacytoma (N=243)	Primary EMM (N=111)	Secondary EMM (N=56)	p-value*
Gender (male)	47.7% (116/243)	59.4% (66/111)	58.9% (33/56)	0,071
Age (median; min-max)	71 (40–92)	66 (42–83)	65 (44–82)	**0.002**
ECOG (%)				0.190
Stage 0-1	73.7% (179/243)	71.2% (79/111)	64.3% (36/56)	
Stage 2	17.3% (42/243)	18.0% (20/111)	30.6% (17/56)	
Stage 3-4	9.0% (22/243)	10.8% (12/111)	5.3% (3/56)	
ISS (%)				**0.031**
Stage 1	25.9% (63/243)	32.4% (36/111)	25.0% (14/56)	
Stage 2	29.6% (72/243)	38.7% (43/111)	32.1% (18/56)	
Stage 3	44.4% (108/243)	26.1% (29/111)	42.9% (24/56)	
R-ISS (%)				0.078
Stage 1	18.9% (46/243)	20.7% (23/111)	5.4% (3/56)	
Stage 2	55.1% (134/243)	59.4% (66/111)	66.1% (37/56)	
Stage 3	25.9% (63/243)	19.8% (22/111)	28.6% (16/56)	
Number of osteolytic lesions (%)				**<0.001**
no lesions	21.4% (52/243)	0%	5.4% (3/56)	
1 lesion	10.7% (26/243)	5.4% (6/111)	0%	
2 lesions	7.4% (18/243)	7.2% (8/111)	8.9% (5/56)	
>2 lesions	60.5% (147/243)	87.4% (97/111)	85.7% (48/56)	
Plasmacytoma type				**0.007**
PS	NA	89.2% (99/111)	71.4% (40/56)	
EMD	NA	10.8% (12/111)	28.6% (16/56)	
1st line treatment (%)				**0.003**
PI+IMID based	39.9% (97/243)	57.7% (64/111)	37.5% (21/56)	
PI based	55.6% (135/243)	39.6% (44/111)	60.7% (34/56)	
IMID based	0%	0.9% (1/111)	1.8% (1/56)	
other	4.5% (11/243)	1.8% (2/111)	0%	
1st line ASCT (%)	23.0% (56/243)	33.3% (37/111)	48.2% (27/56)	**<0.001**
Follow up (months, median; min-max)	27.9 (0.1–104.3)	17.7 (0.1–95.1)	43.2 (0.4–108.9)	**<0.001**

*Fisher exact test

Supplementary table 3A - Progression Free Survival (PFS) in groups of EMM patients according to chromosome 1 aberrations.

			PFS				
			median in months	**95 %CI**		**p-value**	**No. of pts.**
+ 1q21	**Primary EMM**	Amp(1q21)	15,74	7,77	NA	0.073	14
		Gain(1q21)	**14,33**	**5,54**	**21,41**	**<0.001**	**40**
		negative	23,44	16,59	58,10	-	57
	Secondary EMM	Amp(1q21)	1,61	0,56	NA	0.071	9
		Gain(1q21)	2,30	1,80	4,13	0.190	25
		negative	6,43	1,11	14,46	-	22
Del(1p32)	**Primary EMM**	negative	21,51	15,80	32,33	-	88
		Del(1p32)	**10,75**	**5,93**	**24,43**	**0.017**	**23**
	Secondary EMM	negative	3,77	2,00	6,59	-	40
		Del(1p32)	1,87	0,89	4,10	0.083	16

Survival in months. **Bold values** show significant difference in survival when compared to reference group without aberration (Wald test).

Supplementary table 3B - Overall Survival (OS) in groups of EMM patients according to chromosome 1 aberrations.

			OS				
			median in months	**95 %CI**		**p-value**	**No. of pts.**
+ 1q21	**Primary EMM**	Amp(1q21)	22,39	9,21	NA	0.065	14
		Gain(1q21)	**32,69**	**23,05**	**NA**	**0.029**	**40**
		negative	58,10	33,28	NA	-	57
	Secondary EMM	Amp(1q21)	**2,69**	**1,08**	**NA**	**0.012**	**9**
		Gain(1q21)	4,59	3,34	NA	0.230	25
		negative	22,16	4,75	NA	-	22
Del(1p32)	**Primary EMM**	negative	35,64	28,79	NA	-	88
		Del(1p32)	33,28	10,30	NA	0.120	23
	Secondary EMM	negative	10,59	4,59	NA	-	40
		Del(1p32)	**2,69**	**1,08**	**6,79**	**0.001**	**16**

Survival in months. **Bold values** show significant difference in survival when compared to reference group without aberration (Wald test).