

Table SI. Published cases of bullous pemphigoid (BP) associated with anti-programmed cell death protein-1 (PD-1)/programmed death ligand-1 (PD-L1) immunotherapy

Patient number	Sex/age, years	Tumour type	PD-1/PD-L1 inhibitor	Time to skin toxicity (weeks)	Time to blisters (weeks)	Systemic BP treatment	Action regarding immunotherapy because of BP	CA outcome	BP on last FU
1 (S1)	M/75	Melanoma	Pembrolizumab	9	22	p.o. CS	n/a (discont. before BP)	PD	4w; BP resolved
2 (S2)	M/68	Melanoma	Pembrolizumab	24	78	None	Cont.	PR	5w; BP resolved
3 (S2)	M/72	Melanoma	Pembrolizumab	18	18	p.o. CS; Doxycycline; MTX	Lower frequency	PD	3m; BP stable (CS+MTX ongoing)
4 (S3)	M/80	Melanoma	Nivolumab	20	24	p.o. CS; Antibiotics+NCM	Discont.	CR	4m; BP stable (antibiotics+NCM ongoing)
5 (S3)	M/85	Lung SCC	Nivolumab	12	18	p.o. CS	Initially cont., then discont.	PR	10m; intermittent flares
6 (S3)	F/78	Melanoma	Durvalumab	16	52	none	Discont.	PR	1y; intermittent flares
7 (S4)	M/66	Melanoma	Pembrolizumab	9	n/a	p.o. CS	Discont.	CR	1y; still mild symptoms
8 (S5)	F/73	Lung adeno CA	Nivolumab	6	6	p.o. CS; Doxycycline+NCM	Initially cont., then discont.	PD	42d; BP progress
9 (S6)	M/63	Melanoma	Pembrolizumab	88	88	p.o. CS	Cont.	CR	30m; BP resolved
10 (S7)	F/77	Lung adeno CA	Nivolumab	3	6	p.o. CS; Omalizumab	Withhold, then restarted	n/d	n/d
11 (S8)	F/82	Melanoma	Pembrolizumab	6	32	p.o. CS	Discont.	CR	4m; only pruritus
12 (S9)	M/38	Melanoma	Nivolumab	30	36	none	n/a (discont. before BP)	n/d	n/d
13 (S10)	M/73	Melanoma	Pembrolizumab	18	18	Doxycycline+NCM	Discont.	n/d	n/d
14 (S10)	M/90	Melanoma	Nivolumab	24	24	p.o. CS	Cont.	PR	3m; BP resolved
15 (S11)	F/56	Melanoma	Pembrolizumab	4	24	p.o. + i.v.CS; MTX	Discont.	CR	6m; intermittent flares (CS+MTX ongoing)
16 (S12)	M/58	Lung adeno CA	Atezolizumab	36	64	p.o. CS; Doxycycline	Discont.	n/d	7m; BP stable (CS ongoing)
17 (S13)	M/80	Lung adeno CA	Nivolumab	52	80	p.o. CS; Rituximab	Discont.	CR	8m; BP resolved
18 (S14)	M/60	Melanoma	Nivolumab	12	52	p.o. CS	Discont.	n/d	2w; BP resolved
19 (S15)	M/78	Melanoma	Nivolumab	47	47	None	n/a (discont. before BP)	PD	1m; BP resolved
20 (S16)	M/42	Melanoma	Pembrolizumab	32	44	p.o. CS; Doxycycline+NCM	Discont.	SD	4m; BP resolved
21 (S26)	M/65	Melanoma	Pembrolizumab	12	51	p.o. CS	Cont.	CR	n/d
22 (S17)	F/82	Melanoma	Pembrolizumab	24	24	p.o. CS	Cont.	PR	6m; mild symptoms
23 (S18)	M/77	Melanoma	Nivolumab	17	17	p.o. CS; Doxycycline	Cont.	CR	2w; BP resolved
24 (S19)	M/66	Melanoma	Nivolumab	16	28	p.o. CS	Cont.	PR	14m; BP stable (CS ongoing)
25 (S19)	M/78	Melanoma	Nivolumab	12	16	p.o. CS	Cont.	PD	1m; BP resolved
26 (S19)	F/68	NSCLC	Nivolumab	16	16	p.o. CS	Cont.	PD	3w; BP resolved
27 (S20)	M/48	Melanoma	Nivolumab	31	31	p.o. CS	n/a (discont. before BP)	PD	~9m; BP resolved
28 (S21)	M/64	Melanoma	Pembrolizumab	12	21	p.o. CS	Withhold, then restarted	n/d	~9m; BP resolved
29 (S21)	M/71	Melanoma	Pembrolizumab	27	27	p.o. CS	Discont.	PD	n/d
30 (S22)	F/72	NSCLC	Nivolumab	1	6	p.o. CS; Minocycline+NCM	Discont.	n/d	6w; BP stable
31 (S23)	M/78	RCC	Nivolumab	10	10	Rituximab	Discont.	CR	3m; BP resolved
32 (S24)	M/68	NSCLC	Nivolumab	52	52	p.o. CS	Cont.	SD	4w; BP improved
33 (S25)	M/68	Melanoma	Nivolumab	32	32	p.o. CS; plasmaexchange; Rituximab	Discont.	n/d	n/d; BP resolved
34 (S26)	M/77	NSCLC	Nivolumab	12	12	Doxycycline; p.o.CS	Discont.	SD	18m; still pruritus
35 (S26)	F/77	NSCLC	Nivolumab	3	3	p.o. CS; Omalizumab	Discont.	PD	17m; BP resolved
36 (S26)	M/69	NSCLC	Nivolumab	4	4	p.o. CS; Doxycycline+NCM	Discont.	PD	15m; BP resolved
37 (S26)	M/68	Melanoma	Pembrolizumab	40	40	p.o. CS; Doxycycline+NCM	Discont.	PD	7m; BP flares
38 (S26)	M/48	RCC	Nivolumab	28	28	p.o. CS; Doxycycline+NCM	n/a (discont. before BP)	PD	6m; BP resolved
39 (S26)	F/61	NSCLC	Pembrolizumab	36	36	p.o. CS; Doxycycline	Discont.	PD	7m; BP resolved
40 (S26)	F/77	Urothelial CA	Atezolizumab	20	20	p.o. CS; Omalizumab; MTX	Discont.	PR	22m; still pruritus
41 (S27)	F/56	Endometrial CA	Pembrolizumab	16	60	p.o. CS	Cont.	n/d	n/d; BP resolved
42 (S28)	F/86	Melanoma	Pembrolizumab	68	68	p.o. CS	Discont.	n/d	3m; BP stable (CS ongoing)
43 (S28)	M/82	Melanoma	Pembrolizumab	36	36	p.o.+i.v. CS	Discont.	n/d	4m; BP flares
44 (S29)	M/80	NSCLC	Pembrolizumab	21	21	p.o. CS	Discont.	n/d	2w; BP stable (CS ongoing)
45 (S30)	F/69	Melanoma	Nivolumab	22	22	p.o. CS; Dapsone	Discont.	PR	4w; still pruritus
46 (S31)	M/63	Lung adeno CA	Nivolumab	52	104	Doxycycline; p.o.+i.v. CS; Dapsone	Cont.	n/d	16w; BP stable (Dapsone ongoing)
47 (S32)	F/75	Melanoma	Nivolumab	44	44	p.o. CS	Discont.	n/d	10m; BP resolved
48 (S33)	M/78	Melanoma	Nivolumab	40	n/a	Doxycycline+NCM; p.o. CS; Omalizumab	Discont.	CR	15m; BP resolved
49 (S33)	M/78	Esophagealadeno CA	Pembrolizumab	2	n/a	p.o. CS; Doxycycline+NCM; Omalizumab	Cont.	PD	15m; BP resolved
50 (S33)	M/62	Lung adeno CA	Pembrolizumab	52	n/a	p.o. CS; Tetracycline+NCM; Rituximab	Cont.	PD	n/d; BP resolved
51 (S33)	M/58	Melanoma	Pembrolizumab	28	n/a	p.o. CS; Doxycycline+NCM; Rituximab	Discont.	PR	n/d; BP resolved
52 (S34)	M/62	Clear cell CA	Nivolumab	Months	Months	p.o. CS	Withhold, then restarted	CR	3m; BP resolved
53 (S35)	M/87	Urothelial CA	Atezolizumab	76	76	Doxycycline+NCM	Withhold, then restarted	n/d	~4m; BP resolved

Table SI. Contd.

Patient number	Sex/age, years	Tumour type	PD-1/PD-L1 inhibitor	Time to skin toxicity (weeks)	Time to blisters (weeks)	Systemic BP treatment	Action regarding immunotherapy because of BP	CA outcome	BP on last FU
54 (S36)	M/71	RCC	Nivolumab	52	72	p.o. CS; IvIG	Discont.	n/d	8m; BP stable (CS ongoing)
55 (S37)	M/60	Lung adenoCA	Pembrolizumab	18	18	p.o. CS	Discont.	n/d	n/d
56 (S38)	M/84	NSCLC	Pembrolizumab	48	48	p.o. CS	Discont.	CR	11m; BP resolved
57 (S39)	M/68	Cutaneous SCC	Cemiplimab	6	6	p.o. CS; Rituximab	Discont.	n/d	6m; BP resolved
58 (S40)	M/71	Melanoma	Pembrolizumab	36	n/a	p.o. CS; Dapsone; Doxycycline+NCM; Rituximab	Discont.	n/d	18m; still pruritus

adenoCA: adenocarcinoma; CA: carcinoma; CR: complete response; CS: corticosteroids; F: female; IvIG: intravenous immunoglobuline; MTX: methotrexate; n/a: not applicable; M: male; NCM: niacinamide; n/d: not documented; NSCLC: non-small cell lung cancer; PD: progressive disease; PR: partial response; RCC: renal cell carcinoma; SCC: squamous cell carcinoma; SD: stable disease; BP: bullous pemphigoid; w: weeks; m: months; p.o.: per os; i.v.: intravenously; cont.: continued; discont: discontinued; FU: follow up; PD-1: programmed cell death protein 1; PD-L1: programmed cell death ligand 1.

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