

Supplementary Materials

Cutaneous Metastases in Ovarian Cancer

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Table S1. Patients with Sister Joseph's nodule at initial diagnosis who received chemotherapy.

No.	Author (Year)	Age	Histotype	Presenting Symptoms	Metastases Concomitant to Skin Met	Treatment	Survival (months)	Status
1	Brustman (1984) [17]	73	Papillary cystadenoca	Ulcerated, bleeding umbilical mass	Peritoneal D	Surgery, Chemo (CAP-H)	2	DOD
2	Brustman (1984) [17]	59	N/A	NA	Peritoneal D	Surgery, Chemo (CAP-H)	20	DOD
3	Kato (2000) [18]	76	Serous papillary (FTCa)	Umbilical bleeding	Peritoneal D	Surgery, Chemo (CAP)	5	Alive
4	Hashimoto (2000) [19]	81	Serous G2	NA	Peritoneal D	Surgery, Chemo (Carbo/CTX)	7	NED
5	Hashimoto (2000) [19]	47	Serous G1	NA	Peritoneal D	Surgery, Chemo (TC, CTX)	11	NED
6	Yu (2008) [20]	82	Serous	Umbilical mass	Peritoneal D	Surgery, Chemo (TC)	20	Alive
7	Kurt (2009) [21]	49	Mixed type (endometrioid G3 + serous)	Umbilical mass, constipation, abdominal pain	Peritoneal D	Surgery, Chemo (TC)	15	DOD
8	Fukushima (2014) [22]	65	Serous G3	Umbilical mass	Peritoneal D	Surgery, Chemo (TC)	25	AWD
9	Otsuka (2017) [2]	72	Serous, G1	None	Peritoneal D	Surgery, Chemo (TC)	27	DOD
10	Otsuka (2017) [2]	61	Clear cell	None	Peritoneal D	Surgery, Chemo (TC)	22	DOD
11	Otsuka (2017) [2]	70	Serous, G3	None	Peritoneal D	Chemo (Etop, TC)	42	DOD
12	Kirshtein (2006) [23]	54	Poorly diff (FTCa)	(Umbilical hernia)	Peritoneal D (implants)	Surgery, Chemo (Carbo)	13	NED
13	Calista (2002) [24]	65	Adenoca, G3	Umbilical mass	Peritoneal D, LN (retroperitoneal)	Surgery, Chemo (CAP)	6	DOD
14	Matsubara (2004) [25]	59	Serous	Umbilical bleeding	Peritoneal D, LN (pelvic)	Surgery, Chemo (CAP)	8	NED
15	Mizuno (2006) [26]	70	Serous	Umbilical bleeding and itching	Peritoneal D, LN (retroperitoneal)	Surgery, Chemo (PTX)	6	NED
16	Haneda (2001) [27]	74	Serous	Umbilical mass	Peritoneal D, LN (retroperitoneal)	Surgery, Chemo (Carbo/CDDP)	14	DOD
17	Yokota (2014) [28]	70s	Endometrioid, G1	Umbilical bleeding	Peritoneal D, LN (retroperitoneal)	Surgery, Chemo (TC)	17	NED
18	Fukushima (2014) [22]	45	Serous G3 (FTCa)	Umbilical mass, Inguinal mass	Peritoneal D, LN (paraaortic)	Surgery, Chemo (CDDP, PTX)	33	DOD
19	Ohta (2007) [29]	51	Endometrioid, G3	Umbilical mass	Peritoneal D, LN (inguinal)	Surgery, Chemo (TC)	10	NED
20	Kolwijck (2007) [30]	18	Serous	abdominal pain, bleeding and itching umbilicus	Peritoneal D, Pleura, LN (inguinal)	Surgery, Chemo (TC, CAP, TAM, LPD)	28	DOD
21	Cormio (2003) [7]	67	Serous, G3	NA	Peritoneal D, Pleura	Surgery, Chemo (TC)	25	DOD
22	Mimura (2018) [31]	47	Serous, HG	Umbilical pain and bleeding	LN (retroperitoneal, inguinal)	Surgery, Chemo (TC + Bev)	24	NED
23	Haraguchi (2007) [32]	82	Adenoca, G2	Umbilical mass with discharge	None	Surgery, Chemo (TC)	31	AWD

Peritoneal D, peritoneal dissemination; LN, lymph node; NA, not available; FTCa, fallopian tube carcinoma; CAP-H, cyclophosphamide (CTX), Adriamycin, cisplatin (CDDP), hexamethylmelamine; TC, paclitaxel (PTX)/carboplatin (Carbo); TAM, tamoxifen; LPD, liposomal doxorubicin; Etop, etoposide; DOD, dead of disease; NED, no evidence of disease; AWD, alive with disease

Table S2. Patients with non-SJN metastasis that developed at initial diagnosis.

No.	Author (Year)	Age	Site	Histotype	Symptoms Related to Skin Met	Metastases Concomitant to Skin Met	Treatment	Survival (months)	Status
1	Waraich (2006) [33]	49	Chest wall	Undifferentiated	Chest wall nodules	Peritoneal D Inguinal/para-aortic LN	Surgery (BSO + Om)	<1	NA
2	Antonio (2016) [34]	58	Nose	Undifferentiated	Painful nodule on the nose	Peritoneal D	Palliative Chemo	3	DOD
3	Cowan (1995) [5]	81	Abdomen (lt lower quadrant)	Serous (Perit Ca)	Nodule	Peritoneal D	Surgery Chemo (CP)	12	NED
4	Rieger (1998) [35]	85	Port-site (after laparoscopy of other disease)	Moderately-differentiated Adenoca	Painful nodule at port site	Peritoneal D	None (Exploratory laparotomy)	2	AWD

Peritoneal D, peritoneal dissemination; LN, lymph node; BSO, bilateral salpingo-oophorectomy; Om, Omentectomy; NA, not available; Perit Ca, peritoneal carcinoma; CP, cyclophosphamide/cisplatin; DOD, dead of disease; NED, no evidence of disease; AWD, alive with disease.

Table S3. Clinical features of skin recurrences.

No.	Author (Year)	Age	FIGO Stage at Diagnosis/Histotype	Previous Therapies	Time to Skin Rec	Preceding Conditions	Site of Skin Rec	Metastases Concomitant with Skin Rec	Treatment	Status/ Survival
<i>SJN Recurrence</i>										
1	Otsuka (2017) [2]	49	IIIC/ Endom G2	Chemo (TC), Surgery	115 mos	Peritoneal D	Umbilicus	None	Surgery	AWD/ 94+ mos
2	Otsuka (2017) [2]	58	IIIC/ Serous G1	Chemo (TC), Surgery	28 mos	Peritoneal D, Inguinal LN	Umbilicus	Peritoneal D	Chemo (DTX, PLD)	DOD/ 33 mos
3	Otsuka (2017) [2]	45	IIIC/ Serous	Chemo (TC), Surgery	39 mos	Peritoneal D	Umbilicus (1st rec)	Peritoneal D	Chemo (TC, CPT-11)	DOD/ 26 mos
4	Tsai (2006) [36]	72	IIIC/ Serous	Surgery, Chemo (CAP)	8 yrs	Peritoneal D	Umbilicus (1st rec)	None	Resection, Chemo (TC)	NED/ 22 mos
5	Tsai (2006) [36]	44	IIC/ Endom	Surgery, Chemo (CAP)	3 yrs	Pelvic peritoneal D	Umbilicus (1st rec)	None	Resection, Chemo (TC)	NED/ 12 mos
6	Gupta (2014) [9]	56	IA/ Serous	Surgery	2 yrs	None	Umbilicus (1st rec)	None	Resection, Chemo	Alive/ NA
7	Nikolaou (2013) [37]	66	IIA/ Endom	Surgery, Chemo	8 yrs	Pelvic D	Umbilicus	Peritoneal D, liver	Palliative Chemo (PTX, etop)	DOD/ 11 mos
8	Husein-Elahmed (2010) [38]	78	IVB/ low-diff adeno	Surgery, Chemo (cap/oxa)	2 mos	Sigmoid colon, liver	Umbilicus (1st rec)	Sigmoid colon, liver	Chemo (TC)	Alive/ 6 mos
9	Cheng (2017) [10]	67	T3c/ Serous G3	IP chemo (TC), Surgery	2 yrs	Peritoneal D, Puncture (IP chemo)	Umbilicus (1st rec)	None	Chemo	DOD/ 13 mos
<i>Non-SJN Recurrence within surgical scars</i>										
10	Otsuka (2017) [2]	48	IC1/ Clear cell	Surgery, Chemo (MMC+CPT-11)	8 mos	chemo-refractory tumor	Lower abd: incisional scar (1st rec)	None	Surgery, RT	NED/ 140+ mos
11	Otsuka (2017) [2]	53	IIIA1/ Clear cell	Surgery, Chemo (TC)	16 mos	Peritoneal D Axillary, supracl, PA-LNs, Brain	Lower abd: incisional scar	None	RT, immunotherapy	NED/ 93+ mos
12	Otsuka (2017) [2]	54	IIIC/ Serous G2	Surgery, Chemo (TC)	53 mos	Peritoneal D	Lower abd: incisional scar	Perit D, adrenal gland	RT, Chemo (DTX, LPD)	DOD/ 56 mos
13	Traiman (1994) [4]	37	III/ Serous LG	None (exploratory laparotomy)	78 mos	Peritoneal D	Lower abd: incisional scar (1st rec)	None	Chemo (CDDP, epi), RT, Resection	NED/ 72 mos
14	Kohler (1991) [39]	50	IC3/ Mixed G2	Surgery, IP P-32	9 mos	Positive ascites	Lower abd: incisional scar (1st rec)	None	Chemo (CAP), BCG scarification	NED/ 56 mos
15	Carlson (2002) [40]	77	IIIC/ Serous G3	Surgery, Chemo (platin)	NA	Peritoneal D	Upper right quadrant: port site (1st rec)	None	Resection, Chemo (platin)	NED/ 6+ mos
16	Cormio (2003) [7]	68	IIIC/ Serous G3	Surgery, Chemo (TC)	4 mos	Peritoneal D	Lower abd: incisional scar (1st rec)	Peritoneal D	Surgery, Chemo	AWD/ 4+ mos
17	Cormio (2003) [7]	37	IIIC/ Serous G3	Chemo (TC), Surgery	26 mos	Peritoneal D, Drainage	Drainage scar (1st rec)	Peritoneal D, Liver met, LN met	Chemo	DOD/ 3 mos
18	Wooen (2012) [41]	64	T3cN1/ Serous G2	Surgery, Chemo (TC)	10 wks after 1st-line chemo	Peritoneal D, LN	Lower abd: incisional scar (1st rec)	Peritoneal D, Liver met, LN met	catumaxomab IP	DOD/ NA
19	Cormio (2003) [7]	68	IIIB/ Serous G3	Surgery, Chemo (TC)	33 mos	Port (IP chemo)	Port site (1st rec)	Peritoneal D	Chemo	DOD/ 9 mos
<i>Non-SJN Recurrence after Superficial Lymphadenopathy</i>										
20	Otsuka (2017) [2]	72	IVB/ Adeno G3	Laparomy, Chemo (TC, DTX)	3 mos	Axillary, supracl, inguinal, pelvic LN	Abd (during chemo)	Axillary, supracl, inguinal, pelvic LN	Chemo (primary therapy cont'd)	DOD/ 5 mos
21	Charalampidis (2016) [42]	64	NA/ Serous G2	Surgery, Chemo	10 yrs	Neck LN	Back	Brain	NA	Alive/ 24 mos

22	Kayikciogl (2001) [43]	35	T3c/ Serous G2	Surgery, Chemo (CDDP/PTX)	18 mos	(Axillary LN)	Breast (1st rec)	Axillary LN	Chemo (CDDP/PTX/ anthracyclin)	DOD/ 18 mos
23	Demirci (2010) [8]	43	IIIC/ Serous G3	Surgery, Chemo (Platin)	6 yrs*	Inguinal LN & stump rec	Lower Abd	Inguinal LN, stump	RT	Alive/ 7 mos
24	Kim (2012) [11]	60	T3c/ Serous G3	Surgery, Chemo (Carbo/DTX; TC)	42 mos	Axillary supracl LN; Inguinal LN	Groin, Lower extremity	Peritoneal D, Multiple LNs, Muscle	Chemo (Gem/Carbo)	DOD/ 5 mos
25	Yilmaz (2006) [44]	69	T3cM1 (pleura)/ Serous	Chemo (TC) Surgery	31 mos	Pelvic, PA LN (Inguinal LN?)	Lower Abd	LN	Chemo (topo)	DOD/ 4 mos
26	Wiechert (2012) [45]	54	IIC + EmCa/ Endom HG	Surgery, Chemo (TC); Bev	37 mos*	Retroperiton eal LN	Groin, External Genitalia	Retroperitonea l LN, Perit D	RT	DOD/ 10 mos
27	Achimas (2015) [46]	49	IIIC/ Serous G3	Surgery, Chemo (TC); Chemo (topo, gem)	21 mos	Axillary, supra-, infra- diaphragm LN	Chest, Low abd, low extremity	Axillary, supra-, infra- diaphragm LN	Chemo (CPM/Carbo)	DOD/ 1 month
28	Schonmann (2003) [47]	48	IIIC/ Serous G3	Surgery, Chemo (platin/PTX)	42 mos*	Inguinal LN	Lower Abd ~ Upper Thigh	Peritoneal D	Chemo (CDDP)	DOD/ 1 month
Non-SJN Recurrence (Miscellaneous)										
29	Otsuka (2017) [2]	49	IIC/ Serous G3	Surgery, Chemo (TC)	40 mos	Peritoneal D Mediastinal, PA LN, Muscle	Hip, Breast	Mediastinal, PA LN, Muscle	Chemo (TC, CPT-11, PLD)	DOD/ 5 mos
30	Yokoyama (1989) [48]	69	II/ Clear cell	Surgery, Chemo (CAF)	9 mos	Pelvic peritoneal D	Chest wall (1st rec)	None	Chemo (CPA, ADR, 5FU); RT; Immuno - stimulant	DOD/ 43 mos
31	Matsui (2002) [49]	64	T2c/ Serous	Surgery, Chemo (PAIfo)	28 mos	Pelvic, PA LN	Scalp (1st rec)	Pelvic, PA LN	RT, Chemo	DOD/ 12 mos
32	Wuntkal (2004) [50]	55	III (FTCa)/ Serous	Surgery, Chemo (Platin)	2 yrs	Peritoneal D	Right thigh, vulva, perineum (1st rec)	Pelvic tumor	Chemo	DOD/ <1–2 month
33	Charalampidis (2016) [42]	34	III/ Serous G2	Surgery, Chemo (PTX; PLD)	2 yrs	Peritoneal D	Chest, Abd, upper/lower extremities (1st rec)	NA	Chemo	DOD/ 12 mos
34	Lalich (2010) [51]	31	NA/ Endom G2	Surgery	Immedi ately after surgery	NA	Left upper arm (1st rec)	Peritoneal D, Lung, Liver, Brain	Chemo, Surgery	DOD/ 6 mos
35	Nakamura (2012) [52]	63	IV (Perit Ca)/ Serous	Surgery, Chemo (DC)	7 mos	NA	Bilateral thighs (1st rec)	NA	Chemo	AWD/ 9 mos
36	Cokmert (2014) [53]	68	Large cell neuro- endocrine	Palliative RT	2 mos	Peritoneal D Pelvic, PA LN, Lungs, Liver	Leg (progression)	Peritoneal D, Pelvic, PA LN, Lungs, Liver	Chemo (etop + Carbo)	DOD/ 5 mos
37	Patsner (1988) [3]	70	N1/ Adeno G3	Surgery, Chemo (CDDP + CPM)	NA	PA LN	Abd, Groin, Thigh, Perineum	Abd, Groin, Thigh, Perineum	Chemo (CDDP + CPM)	DOD/ <1 mo

Skin recurrences after laparoscopic surgery and paracenteses are excluded. Endom, endometrioid; LG, low-grade; EmCa, endometrial cancer; FTCa, fallopian tube cancer; Perit Ca, peritoneal cancer. Peritoneal D, peritoneal dissemination; LN lymph node; PA, para-aortic; abd, abdomen; supracl, supraclavicular; NA, not available. TC, paclitaxel (PTX)/carboplatin (Carbo); CAP, cyclophosphamide (CPM)/Adriamycin (ADR)/cisplatin (CDDP); cap, capecitabine; oxa, oxaliplatin; MMC, mitomycin C; CPT-11, irinotecan; DTX, docetaxel; topo, topotecan; gem, gemcitabine; CAF, CPM/ADR/5-FU; Ifo, ifosfamide; PLD, pegylated liposomal doxorubicin; DC, DTX/Carbo; epi, epirubicin; etop, etoposide; RT, radiation therapy; IP, intraperitoneal; AWD, alive with disease; DOD, dead of disease; NED, no evidence of disease.

Table S4. Port-site recurrence of borderline ovarian tumor.

No	Author (Year)	Age	FIGO Stage	Histotype	Type of Surgery	Risk Factors	Time Interval	Treatment	Status/ Survival
1	Hsiu (1986) [54]	30	IIB	Serous	Biopsy of OvT	Papillary excrescences on both ovaries, Drainage, Ascites, Peritoneal implants	3 wks	Surgery, Chemo (CAP)	NED/ 9 mos
2	Hsiu (1986) [54]	28	III	Serous	Biopsy of OvT	Papillary excrescences on both ovaries, Ascites, Peritoneal & omental implants	3 wks	Surgery, ip P32, Chmeo (Mel, CAP)	NED/ >6 yrs
3	Gleeson (1993) [55]	31	IIB	Serous	LSO, Biopsy of rt. OvT	Papillary excrescences on both ovaries, Peritoneal implants	2 wks	Surgery, Chemo (CP)	Alive/ NA
4	Shepherd (1994) [56]	23	I	Serous	Cystectomy	None	6 wks	Surgery	NED/ 24 mos
5	Morice (2004) [57]	28	I	Serous	Cystectomy	Recurrence of serous borderline lt. OvT, excrescences on rt. ovary	11 mos	Surgery	NED/ 11 mos
6	Morice (2004) [57]	28	II	Serous	Biopsy of OvT	Bilateral OvTs, Peritoneal implants	3 mos	Surgery	NED/ 23 mos
7	Morice (2004) [57]	55	I	Mucinous	RSO	None	1 mo	Surgery	NED/ 51 mos
8	Furukawa (2014) [58]	50	IA	Mucinous*	LSO	None	26 mos	Surgery, Chemo (TC)	Alive/ NA

* Invasive recurrence of mucinous ovarian tumor at a port site. OvT, ovarian tumor; LSO, left salpingo-oophorectomy; RSO, right SO; NED, no evidence of disease; NA, not available. CAP, cyclophosphamide (CPM)/Adriamycin (ADR)/cisplatin (CDDP); Mel, melphalan; CP, CPM/CDDP; TC, paclitaxel/carboplatin



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